

2002-2003

A N N U A L R E P O R T

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school of electrical & computer engineering

ECE FACTS

Number of Faculty/Staff

Number of faculty (tenure-track).....	115
Joint appointments.....	2
Adjunct and part-time faculty.....	45
Professors Emeriti.....	18
Research and administrative staff/academic professionals.....	179

Number of Undergraduate Students

(Fall Semester 2002)

Electrical engineering.....	955
Computer engineering.....	903
Computer engineering—Georgia Tech Regional Engineering Program.....	36
Total.....	1,894

Number of Graduate Students

(Fall Semester 2002)*

Doctoral.....	420
Special.....	7
Master of Science/M.S.E.C.E.....	579
Total.....	1,006

Number of Degrees Awarded

B.S.Cmp.E.....	143
B.S.Cmp.E.-GTREP.....	12
B.S.E.E.....	248
M.S.....	97
M.S.E.C.E.....	197
Ph.D.....	49
Total.....	746

Grants and Contracts

Total funds received on external grants during FY 03.....	\$37,763,765
Number of proposals submitted to external agencies during FY 03.....	281

* Graduate program offers combined electrical and computer engineering degrees

FACULTY CREDO

Unity of Purpose

Our purpose is to provide students at all degree levels with the highest quality preparation for successful professional careers, and through dedicated scholarship, to advance our profession. We will contribute to the expansion and responsible application of knowledge to the benefit of society. Our relentless pursuit of these goals will fulfill our vision of a Georgia Tech preeminent in information and telecommunications systems, energy and automation systems, and in the underlying enabling technologies.

Diversity of Function

We recognize and embrace the technical diversity of our profession. We seek to enhance this diversity by active engagement with relevant associated Georgia Tech and external professional activities. We will encourage cultural diversity within the ranks of the profession by being a leader in the education of minority and women electrical engineers and computer engineers, students attracted and taught by a faculty equally rich in role models.

Professionalism of Method

We participate in the most noble aspect of a noble profession. We will honor that profession by example, instilling in our students by our own conduct, the highest standards of professional behavior.

The School of Electrical and Computer Engineering (ECE) remains among the largest producers of electrical engineering and computer engineering graduates in the United States and continues to develop programs of exploratory research in both new and existing technologies. Our commitment to supporting and recognizing our outstanding faculty, staff, and students and their accomplishments; creating innovative research programs; and providing state-of-the-art educational programs to our students is reflected in the following highlights for 2002-03.

FACULTY HONORS AND AWARDS

IEEE Awards

Nan Marie Jokerst was named IEEE Fellow for contributions to the integration and packaging of optoelectronic devices for the realization of optical interconnections and interfaces and was chosen as the 2002 IEEE Harriett B. Rigas Award for the outstanding engineering faculty woman who has made a significant contribution to undergraduate education within an IEEE/ABET-accredited program.

Joy Laskar received the IEEE 2003 Outstanding Young Engineer of the Microwave Theory and Techniques Society for outstanding contributions to the modeling and development of high frequency, high performance communications modules. Dr. Laskar was also elected as a senior member of the IEEE.

Ajeet Rohatgi received the IEEE William R. Cherry Award for those who have made outstanding and sustained contributions to the advancement of photovoltaic science and technology.

Gordon St ber received the IEEE Vehicular Technology Society James R. Evans Avant Garde Award for his contributions to theoretical research in wireless communications.

Emmanouil M. Tentzeris received the IEEE Components, Packaging, and Manufacturing Technology Society 2003 Outstanding Young Engineer Award for his contributions to RF circuit design of high performance IC devices and to IEEE- and CPMT Society-sponsored conferences and activities. Dr. Tentzeris was also elected as a senior member of the IEEE.

NSF CAREER Awards

Ali Adibi received his NSF CAREER Award for integrated chip-scale wavelength division multiplexing devices using photonic crystals.

Magnus Egerstedt received his NSF CAREER Award for linguistic control of mobile robots.

Global and National Awards

Ali Adibi received the following honors: the David & Lucile Packard Fellowship for Science and Engineering from the Packard Foundation for controllable photonic crystals that can be adapted into ultra-small biosensors; the Optoelectronics Young Investigator Award from SPIE

(The International Society for Optical Engineering) in the area of optoelectronics; and the NASA Space Act Award for creative development of non-volatile holographic storage in photorefractive crystals.

Russell D. Dupuis received The Minerals, Metals, and Materials Society 2004 John Bardeen Award for an established research and publications track record in electronic materials.

Joy Laskar received the 2003 Outstanding Young Alumnus Award of the College of Engineering and Science at Clemson University.

Steven W. McLaughlin received the 2002 International Storage Industry Consortium Technical Achievement Award for pioneering contributions to multilevel optical disc technology.

William E. Sayle was named a Fellow of the American Society for Engineering Education for his dedicated and sustained contributions to engineering education through caring mentorship of precollege and undergraduate students, his effective management of one of the nation's largest electrical and computer engineering programs, and his influential leadership of national and international engineering education accreditation.

Georgia Tech Awards

Ali Adibi Class of 1940 W. Howard Ector Outstanding Teacher Award

Kevin F. Brennan (Deceased August 2003) Class of 1934 Distinguished Professor Award

Martin A. Brooke Outstanding Doctoral Thesis Advisor Award

Monson H. Hayes Outstanding Continuing Education Award

William D. Hunt Class of 1934 Outstanding Interdisciplinary Activities Award

James H. McClellan and **Ronald W. Schafer** Class of 1934 Outstanding Innovative Use of Education Technology Award

Ajeet Rohatgi Georgia Tech President's Council Outstanding Faculty/Staff Advisor Award.

Madhavan Swaminathan Outstanding Faculty Leadership for the Development of Graduate Research Assistants Award

John P. Uyemura 2003 Georgia Tech Graduate Student Government Faculty Member of the Year (posthumously awarded)

Roger P. Webb Vice Provost for Research Special Recognition Award

STAFF HONORS AND AWARDS

Sharon Crouch and **LaJauna Guillory** earned the Management Development Certificate through the Georgia Tech Office of Organizational Development.

Charlotte Doughty became the first person at Georgia Tech to earn the Georgia Tech Software User Expert Certificate. This certificate recognizes those employees who have earned Microsoft Office User Specialist (MOUS) Certification in Word, Excel, and PowerPoint. MOUS is the globally recognized standard for validating expertise with the Microsoft Office suite of business productivity programs.

Christy Ellis, Sharon Lawrence, Linda Newton, and Carla Zachery earned the Office Professional Certificate through the Georgia Tech Office of Organizational Development.

Kayron Gilstrap and Marcus Johnson earned the Supervisory Development Certificate through the Georgia Tech Office of Organizational Development.

Jacqueline L. Nemeth received a Georgia Tech Outstanding Staff Performance Award.

Nickolas Kingsley received a President's Undergraduate Research Award (PURA) from the office of Georgia Tech President Wayne Clough.

Justin Kloos, Vikram Raj, and Steven Sanders received Henry Ford II Scholar Awards for the best academic records in the College of Engineering at the end of the third year of undergraduate study.

Mile Milisavljevic received the 2002 Sigma Xi Ph.D. Thesis Award.

Eric J. Orrington received the AESO Systems Graduate Minority Engineering Award as the outstanding graduating minority senior who has been admitted to graduate school in engineering.

John Parsons received the Hoyt Coffee Memorial Award for Writing, which is presented to an outstanding writer for *The Technique*.

William Robinson was awarded a Ford Fellowship, which are awarded to 130 outstanding scholars across the U.S. who are underrepresented minorities. Mr. Robinson is advised by **D. Scott Wills**.

Darryl Julian Ward received the Georgia Tech Society of Black Engineers Faculty Advisor Excellence Award for outstanding scholarship and leadership qualities.

STUDENT AWARDS AND HONORS

Brian Patrick Boyd received the Briean Scholarship Cup for achieving the highest grade point average among all senior-level, Georgia Tech co-op students.

Nathan Greer, Olivier Guerreau, Kay Hill, Jean-Marc Merolla, Jeremy Silver, and Catherine Thorn received the Georgia Engineering Foundation Senior Design Award.

Second Annual ECE Awards Program A Smashing Success

The School of Electrical and Computer Engineering held its second annual awards program on April 23, 2003 at the Georgia Tech Student Center Ballroom. C. Dean Alford, chair of the ECE Advisory Board, and The Honorable Daniel A. Webster, Florida State Senator representing the 9th District, hosted the program. ECE faculty and staff who received awards at the Georgia Tech Faculty/Staff Honors Luncheon, students who received recognitions at the Georgia Tech Student Honors Day, and recipients of ECE Outstanding Graduate Teaching Assistant Awards were also recognized during this event.

Student Awards

Outstanding ECE Sophomore Award
Ryan Jesse Pirkl

ECE Junior Scholar Award
Lucas Milner

Most Outstanding ECE Senior Co-op Award
Brian Patrick Boyd

ECE Undergraduate Research Award
Ning Wu

Outstanding Service to Georgia's Community Award
Tim Cooper

Faculty Award, School of ECE
Chris Wieczorek

Outstanding ECE Senior Award
David Richard Reid

ECE Senior Scholar Award
Brian Patrick Boyd
Alaa Amin Kharbouch
Shahriar Rohinton Khushrushahi
Wing Sze Mona Wong

Colonel Oscar P. Cleaver Awards

Ismail Baskaya
Zesheng Chen
Gavin Ho
Guanglei Liu
Ramanan Bairavasubramanian

ECE Teaching Assistant Excellence Award
Adam Wathen

ECE Graduate Reserch Assistant Excellence Award
Aziz Umit Batur

Staff Awards

Hats Off Performance Award
Diana Fouts

GTEAM Performance Award
Charlotte Doughty
Christy Ellis
Cordai Farrar
Kayron Gilstrap
Debra Kelley
Carla Zachery

Research Spotlight Award
Didier Contis

Academic Spotlight Award
Leyla Conrad

Faculty Awards

Outstanding Junior Faculty Member Award
Yucel Altunbasak
Jeffrey A. Davis

Outstanding Graduate Research Advisor Award
John A. Copeland

Richard M. Bass/Eta Kappa Nu Outstanding Teacher Awards
W. Alan Doolittle
James H. McClellan

Distinguished Professor Award
George J. Vachtsevanos

Lifetime Achievement Award
William E. Sayle

Special Recognition

The Georgia Research Alliance Catalyst Award
Roger P. Webb

RESEARCH, EDUCATIONAL, AND PROFESSIONAL MILESTONES

NEW RECORD IN 2002-03 GRANTS AND CONTRACTS ACQUISITION Despite a stagnant economy, ECE faculty members acquired a record-breaking \$37,763,765 in research grants and contracts during fiscal year 2003. This stellar effort represented 40 percent of the research funding in the College of Engineering, 25 percent of the research funding for the Georgia Tech academic units, and 13 percent of the entire Institute, including the academic units and the Georgia Tech Research Institute. During FY 03, ECE faculty members submitted 281 proposals, totaling \$142,301,293, to various governmental agencies and industrial sources.

U.S. NEWS AND WORLD REPORT RANKINGS Georgia Tech's College of Engineering was ranked fifth in the 2004 graduate engineering school rankings compiled by *U.S. News and World Report*. In rating specific, graduate engineering disciplines, Georgia Tech's electrical engineering program ranked sixth in the nation.

In the magazine's rankings for undergraduate engineering programs, completed in fall 2002, the College of Engineering ranked sixth for the second year in a row. *U.S. News and World Report* also ranked Georgia Tech's undergraduate electrical engineering program seventh and the computer engineering program twelfth.

GEORGIA TECH LORRAINE A non-profit corporation located in Metz, France and operated under French law, Georgia Tech Lorraine (GTL) has four areas of emphasis—graduate education, sponsored research, undergraduate summer education, and continuing education. GTL offers undesignated master's degrees, master's degrees in either electrical and computer engineering or mechanical engineering, and Ph.D. degrees in both disciplines, in addition to a 10-week-long undergraduate summer program. GTL is led by Hans B. P. tgen and Fran ois J. Malassenet, as its president and directeur, respectively.

Cooperative agreements with local partner institutions enable students to pursue double degree programs in engineering and sciences, in addition to degrees from Georgia Tech. Upon successful completion of these highly innovative and integrated programs, students are awarded master's degrees from Georgia Tech and graduate diplomas from a partner institution. The Bin me Program, a double-degree graduate program and an industry-university partnership between the U.S. and France, allows two-member, Franco-American student teams to immerse themselves in the other country's culture through an industrial internship and academic study. In December 2002, GTL was honored with the International Initiatives Award for the Bin me Program at the Troph es de Grandes Ecoles d Ing nieurs Awards Ceremony, held in Paris, France, in December 2002.

GEORGIA TECH REGIONAL ENGINEERING PROGRAM GTREP offers undergraduate degrees in civil engineering and computer engineering, as well as master's degrees in ECE, civil and environmental engineering, and mechanical engineering. During 2002-03, the University System Board of Regents approved the formation of bachelor degree programs in both electrical engineering and mechanical engineering. In fall 2003, GTREP will relocate its hub facility to Savannah's new Technology and Engineering Campus. Created by the Savannah

Economic Development Authority, TEC² is an innovative interpretation of the traditional office park that is designed to house private industry, community development offices, business incubators, and other functions of a university campus environment.

Enrollment in the computer engineering portion of GTREP was 36 students amongst the program's three participating institutions in southeast Georgia—Georgia Southern University, Armstrong Atlantic State University, and Savannah State University. Twelve computer engineering seniors graduated during 2002-03. Joseph L.A. Hughes and Douglas B. Williams coordinate the GTREP computer engineering program, and J. David Frost serves as GTREP director.

ARBUS CENTER FOR DISTRIBUTED ENGINEERING EDUCATION The Arbutus Center for Distributed Engineering Education, which was formally established in November 2002, is the focus for research, development, and deployment of methodologies, techniques, and courseware for Georgia Tech's electrical engineering and computer engineering curricula. Some of these technologies are currently used for on campus, real-time instruction, while others allow for students to view all classroom materials online at a time that is convenient for them. Currently, GTREP and GTL use these technologies for remote course delivery.

The Arbutus Center was funded through a \$2.25 million grant from James R. Carreker, a 1969 electrical engineering graduate of Georgia Tech, and his wife, Helen, along with certain matching funds from the Georgia Research Alliance (GRA), an economic development partnership of Georgia's research universities, business community, and state government. The Arbutus Center is led by Thomas P. Barnwell, III, Arbutus Chair in Distributed Engineering Education and GRA Eminent Scholar.

GEORGIA TECH ANALOG CONSORTIUM The Georgia Tech Analog Consortium (GTAC) is a proven, effective way for companies to receive direct and tangible benefits through faculty access, student research, and semi-annual research reviews that are held in the spring and fall. At the same time, the program gives sponsored students real world experience through their research relationships and cooperative/internship assignments. ECE has a very active educational program in analog circuits and systems at both the undergraduate and graduate level.

GTAC's strength and vitality rests in the dynamic relationships that it fosters among students, faculty, and the analog microelectronics industry. It was founded in 1989 and is now under the leadership of Gabriel A. Rinc n-Mora. GTAC consists of 14 full-time faculty members, one full-time staff member, approximately 50 Ph.D. students, and 30 master's students. The Consortium's member companies include Adtran, Analog Devices, Intersil, ON Semiconductor, Raytheon, RF Micro Devices, Schlumberger, and Texas Instruments. Between fall 2002 and summer 2003, GTAC attracted almost \$500,000 in sponsorship funds.

GEORGIA TECH BROADBAND INSTITUTE In 2003, the Georgia Tech Broadband Institute (GTBI), led by Nikil Jayant, renewed its sponsorships from BellSouth, Broadcom, EG Technology, Hewlett-Packard, Intel, NTT DoCoMo Labs USA, Arris, Alcatel, and 3e Technologies International. In addition, new partnerships were formed with Samsung, Panasonic, AirDefense, and Spirent Communications.

GTBI funded 15 projects in FY 03, which were selected based on

sponsor inputs. These projects addressed the physical layer—both wireless and optical, networking and security, and multimedia and user interface. The funding for these projects supported over 20 students. In addition, GTBI held semi-annual Industrial Advisory Board meetings in October 2002 and April 2003, where the results of the industry-guided research were presented. These sessions offered the sponsors opportunities to interact with the faculty and students during poster sessions and lab tours/demo sessions. The April meeting resulted in over 25 projects getting selected for new or continued funding in FY04, supporting over 30 students. The areas of focus remain the same.

GTBI also began to integrate the DSL, cable, wireless, and optical labs to create a comprehensive testbed for next generation access. Mani Subramanian is leading this effort, called the Last Mile Lab.

GEORGIA ELECTRONIC DESIGN CENTER (formerly Yamacraw) The Yamacraw program was established in 1999 as a job growth effort that would establish a cluster of electronic design competence with accompanying highly skilled jobs over five to seven years. With Herb Lehman serving as the director, Yamacraw has grown to over 30 member companies with almost 3,000 jobs committed.

The Georgia Electronic Design Center (GEDC), with Joy Laskar serving as director, provides the State of Georgia the opportunity to grow and capitalize on the important technology subsystem sector, which represents the boundary between telecommunications, microelectronics, analog/RF, and mixed signal systems. The GEDC is housed within the Technology Square Research Building in Georgia Tech's new 5th Street Complex. The GEDC supports almost 50 faculty and 150 graduate students, the majority of whom come from ECE. The GEDC's mission is to focus on innovative research resulting in job creation and job attraction within the State of Georgia. The GEDC has established focused themes which foster success through: (1) world-class research, (2) deep and meaningful industry collaboration, and (3) IP generation and revenue generating commercialization efforts.

The GEDC has over 30 active member companies and annual research budget of over \$10 million, including funding from industry, federal agencies, and the State of Georgia. In addition, the GEDC has been working closely with ATDC to help foster early stage companies based upon research supported by the GEDC.

GEORGIA CENTERS FOR ADVANCED TELECOMMUNICATIONS TECHNOLOGY The Georgia Centers for Advanced Telecommunications Technology (GCATT) houses a number of Georgia Tech and ECE-based research centers, multi-university collaborative projects, and an advanced communications business incubator. As a GRA initiative, GCATT also supports advanced telecommunications research centers from the University of Georgia, the Medical College of Georgia, and Georgia State University. Nikil Jayant serves as executive director of GCATT.

During FY 03, GCATT reinforced its TCP theme—technology, commercialization, and policy—and continued to receive positive feedback from both industry and government supporters in these areas. The core technology research themes of GCATT continue to be on networking, content processing, and system solutions.

February 2003 kicked off a new event series at GCATT with the Next Generation Video Communications Symposium. The series is called GCATT Presents and occurs monthly, co-sponsored by companies, organizations, associations, government-related entities, or GCATT

centers for the purpose of bringing the business, academic, and political communities together. Topics include the breadth of advanced technology topics from distance learning to network security to technology policy.

In June 2003, GCATT submitted an interdisciplinary, multi-campus pre-proposal to the National Science Foundation for the formation of a Science and Technology Center. With a goal of supporting integrative research in pervasive broadband, the vision is for the Center to be the key academic initiative behind the effort to make the U.S. a world leader in this area.

In the area of policy, Helena Mitchell, director of the Office of Technology Policy and Programs (OTP), was one of 30 internationals invited to attend the International Conference on Aging, Disability, and Independence advanced technology workshop program in London, England in June. Her presentation discussed her earlier work in gerontology, advanced technology from the perspective of a former FCC official, and how they converged and contributed in her work with the Wireless RERC.

OTP also completed the first phase of a policy/technical project in conjunction with ECE called Using Assigned but Unlicensed Spectrum (Floating) to Provide High Bandwidth Communication Services to Rural Areas. The project is a three-year field study under the direction of Paul Steffes, who is a senior research associate in OTP and professor in ECE.

OTP's Public Policy Luncheon Series continued into its 12th year in association with the Atlanta Chapter of the Federal Communications Bar Association. Other programs and events sponsored by OTP were TelecomSouth III—The Divide Reconsidered: Building Telecom Value; EU-USA Telecom Regulatory Policy - Does a Global Model Exist?; Technology Partnerships Conference and Exhibition; and the Government Technology Conference.

CENTER FOR EXPERIMENTAL RESEARCH IN COMPUTER SYSTEMS The Georgia Tech Center for Experimental Research in Computer Systems (CERCS) is led by Karsten Schwan of the College of Computing (CoC) and co-directors Douglas M. Blough and Sudhakar Yalamanchili of ECE and Calton Pu from CoC. In the last year, CERCS officially became a NSF Industry/University Cooperative Research Center.

A research team, including Hsien-Hsin Sean Lee from ECE, was awarded a four-year, NSF ITR grant on power awareness in embedded systems, with research topics including computer architecture, operating systems, compilers, and autonomous robotics. This same team also received substantial funding from Intel Corporation for research in this domain, including Intel's newest XScale processors and related equipment. Another CERCS research team has received large-scale equipment funding from Intel and personnel funds from NSF for research in embedded communications, which includes the participation of ECE's David E. Schimmel, George Riley, and Dr. Lee. This effort concerns the implementation of application-level functionality in network routers, based on Intel's IXP architecture, with Dr. Schimmel and Didier Contis (jointly with Wenke Lee from CoC) focusing on intrusion detection functionality, and other Georgia Tech faculty addressing the systems mechanisms needed for placing relevant application functionality onto network routers. In this context, Georgia Tech is the first U.S. university to receive Intel's new IXP 2400 boards, which provide gigabit communication speeds for edge routers. Intel also provided funding to en-

hance Netlab, a key teaching and research resource constructed over the last year, which is a 40-node cluster machine that permits end users to construct emulations of arbitrary Internet (or mobile) network topologies. End users can then run their application programs on this machine as if they were running on actual computer networks.

During the last few months of FY 2003, CERCS researchers have undertaken substantial new efforts to support Georgia Tech's efforts in high end computing and networking. CERCS researchers assisted Georgia Tech in its efforts to raise NSF funding for a Teragrid network hub in Atlanta, in part through a successful collaboration with Oak Ridge National Laboratories, spearheaded by Georgia Tech's Vice Provost for Research Charles Liotta.

CENTER FOR RESEARCH ON EMBEDDED SYSTEMS AND TECHNOLOGY The Center for Research on Embedded Systems and Technology (CREST), led by Krishna V. Palem as director, was established in 2000 with a two-fold mission of impacting embedded systems technology through groundbreaking research and leading in curricular innovations focused on embedded systems. CREST drives the innovation of compiler-centric tools to enable rapid prototyping of embedded systems based on challenging research in new models of computing, programming languages, compiler optimizations, architectural support, and novel adaptive hardware. The mission is to reduce, by orders of magnitude, the non-recurring engineering costs and time-to-solution of emerging systems, thus accelerating the pervasive growth of embedded systems.

During FY 03, CREST grew significantly, consisting of five faculty members and approximately 40 graduate students and was funded by industrial partners as well as government agencies, including DARPA, NSF, Hewlett-Packard, Mentor Graphics, and Panasonic. Ongoing major research thrusts include languages for hybrid and embedded control applications; embedded RTOS hardware and software for system-on-a-chip; low power architectures; and computer-aided design for high performance, low-power, and reliable computing systems. During the last year, the Center started two initiatives under DARPA funding: thermodynamics of computing and polymorphic computing. The former establishes a novel foundational analysis for energy aware computing, a key concern of future embedded systems. The latter initiative is focused on compilation and architecture optimization tools for emerging dynamically reconfigurable architectures conceived for very high-end embedded applications. CREST's research interests have sparked the development of several courses, supported by funds from Hewlett-Packard. In the last year, curricular efforts have seeded courses at the International Institute of Information Technology at Hyderabad, India, while similar efforts are now under discussion with the Nanyang Technological University and the Asian Institute of Technology in Bangkok, Thailand.

MICROELECTRONICS RESEARCH CENTER The Microelectronics Research Center (MiRC) provides the largest and most comprehensively equipped cleanroom facility on the Georgia Tech campus for collaboration among faculty, students, research staff, and industry in the highly technical and innovative fields of microelectronics, micro-fabrication, and nanotechnology. The MiRC's goal is to continue to meet the ever increasing interdisciplinary demands for process and fabrication tools and expertise, as well as cleanroom, lab, work, and meeting space made available to traditional and non-traditional users.

Supporting operation of the 8,500-square-foot cleanroom facility, and keeping pace with the three-fold increase in cleanroom use since 1996, has been the total commitment of the 43-member staff. This commitment provides the highest quality set of services to a multidisciplinary research community with 20 specially equipped labs, 35 faculty offices, 177 cubicle seats for students, and six conference rooms. Since 1989, the MiRC has developed relationships with programs across engineering and research disciplines, including CMOS, IFC, MEMS, PRC, and UCEP, as well as established and built relationships with the GRA and the NSF-sponsored National Nanotechnology Infrastructure Network to promote growth in cross-university use of resources and personnel. Many fledgling programs are underway that promise leading edge discoveries, most of which will be aided by the latest addition to the Center, the E-beam nanolithography tool, which is scheduled to be operational in early 2004. The MiRC is honored to be one of only two university research centers in the U.S. to provide this nanoscale technical capability to users.

PACKAGING RESEARCH CENTER The Packaging Research Center (PRC), funded by NSF as one of its Engineering Research Centers (ERCs), was established to improve U.S. competitiveness in electronics. The Center has embraced a new technical vision called SOP (system-on-a-package) and reformation of microsystems packaging education for the development of skilled human resources necessary to support the industry's growth from the current \$100 billion to the \$200 billion expected by the year 2008.

The PRC research vision is based on SOP, an entirely new fundamental microsystems paradigm pioneered by the Center, in contrast to SOC (system-on-a-chip) which is being pursued by the electronics industry. SOC, a natural evolution of integrated circuits (IC), doubles the number of transistors on an IC, following Moore's Law; this approach presents not only fundamental physical limits for computing, but also integration limits for wireless and optical communications. IC packaging and the technologies by which components are integrated into systems today present another set of barriers: cost effectiveness, bulkiness, uncertain reliability, and low performance end-product systems. The SOP concept, however, overcomes these barriers by combining the best of both IC and the IC package: transistor density and component density of RF, optical, and digital integration. In addition, such a concept leads to miniaturization, lower cost, higher performance, and higher reliability of systems. It is also consistent with the emerging convergent computing, communication, and consumer systems trends. Thus, SOP can be thought of as the packaging is the system, not the bulky board. The PRC has demonstrated a number of fundamental, enabling, and system-level concepts in designs, modeling, materials, processes, and structures and has integrated them to demonstrate the first convergent systems called Intelligent Network Communicator.

The educational vision of the Center is to reform microsystems packaging education, which has evaded the academic community for decades. Until the PRC was created, no broad set of courses, curricula, books, or degrees existed. The PRC's approach is fundamental, system-level, and global at the pre-college, undergraduate, graduate, and industry levels, leading to the development globally competitive systems engineers. The Center has graduated a total of 454 such engineers who are now providing technical leadership throughout the entire U.S. electronics supply chain. The educational program also includes tight

coupling of research to the curriculum, global business and management courses, internships in the U.S. and abroad, outreach to underrepresented groups, and national and international outreach with world-class universities and professional societies.

CENTER FOR BOARD ASSEMBLY RESEARCH Founded seven years ago, the Center for Board Assembly Research (CBAR) is engaged in research that will enable the manufacture of next generation electronic products. CBAR's mission is to develop new technology for system-level board assembly to support ongoing product development trends such as reduced size and cost and enhanced performance. CBAR has a state-of-the-art surface mount technology (SMT) assembly laboratory that contains two SMT assembly lines with extensive post-process inspection capabilities. The total value of the consigned equipment exceeds \$4.5 million. CBAR's industrial membership consists of 23 companies, and eight faculty members participate in CBAR research activities. David G. Taylor is the director of CBAR, and he also serves as associate director of the Manufacturing Research Center.

UNIVERSITY CENTER OF EXCELLENCE IN PHOTOVOLTAICS RESEARCH AND EDUCATION During its 11-year existence at Georgia Tech, the University Center of Excellence in Photovoltaics Research and Education (UCEP) has made considerable strides in making solar-electric power technology less expensive and more efficient. Established by the U.S. Department of Energy in 1992, UCEP is one of the largest solar power research centers in the U.S.

Led by Ajeet Rohatgi, Regents Professor and Georgia Power Distinguished Professor, UCEP is unique because it has both state-of-the-art research laboratories and an on-campus solar powered facility that also acts as a research laboratory. UCEP labs house facilities for materials characterization, solar cell modeling, process development and cell fabrication, and solar cell testing. Dr. Rohatgi and researchers in the Center have established several world records for high efficiency cells. In 2003, UCEP achieved five new record efficiencies, including 18.2 percent and 17.9 percent efficient cells on EFG and String Ribbon Si with photolithography contacts and 17 percent, 16.1 percent, and 15.6 percent efficient cells on EFG, SR, and HEM multicrystalline materials with manufacturable screen printed contacts. A technological centerpiece during the 1996 Summer Olympics, the 342 kW rooftop, grid connected photovoltaic (PV) system at the Georgia Tech Aquatic Center now serves as a test bed for large-scale PV arrays. The solar-powered system provides about 30 percent of the electrical energy needed for the Aquatic Center and saves Georgia Tech almost \$30,000 a year in energy bills. It has produced more than 2 billion watt hours of electrical energy during the last six years, an amount sufficient to provide power to about 70 homes, and prevents the release of almost 400 tons of carbon dioxide into the atmosphere every year.

NATIONAL ELECTRIC ENERGY TESTING, RESEARCH, AND APPLICATIONS CENTER Widely recognized as one of the world's foremost electric energy research, testing, and evaluation facilities, the National Electric Energy Testing, Research, and Applications Center (NEETRAC) is a member-supported electric energy research, development, and testing center that is engaged in a wide spectrum of innovative activities. Led by Hans B. P. ttgen, NEETRAC consists of 11 faculty members—five from ECE, two from industrial and systems engineering, two from materials science and engineering, one from mechanical engineering, and one from civil and environmental engineering.

Through membership in this innovative enterprise, NEETRAC's industrial partners enjoy streamlined access to the faculty, students, and facilities of Georgia Tech's world-class engineering schools and the Georgia Tech Research Institute. During FY 2003, the Center's industrial members included Baltimore Gas and Electric, Borealis Compounds LLC, Cooper Power Systems, Cox Industries, Duke Energy Corporation, Entergy Transmission, Equistar Chemical, Florida Power and Light Company, Georgia Power Company, PEPCO, Pirrelli Cable Corporation, Public Service and Gas Company, South Carolina Electric and Gas Company, Southern California Edison, Southern States Inc., Tyco Electronics Corporation, Union Carbide Corporation, and Virginia Power.

INTERACTIVE MEDIA TECHNOLOGY CENTER The Interactive Media Technology Center (IMTC) is a research center focused on advancing science, technology, education, and culture through the use of interactive technologies. IMTC consists of nine research faculty, four research/administrative staff, and a number of undergraduate and graduate students. IMTC also contains a biomedical component referred to as the Biomedical Interactive Technology Center (BITC). The Center is directed by Mark A. Clements, who is also a professor in ECE. The Center was founded in 1989 to support Atlanta's bid for the 1996 Summer Olympics, and it is funded via research contracts from industry and federally-funded research grants. One main focus of the Center is the creation of startup companies, as well as assisting small, local companies with technology needs.

One major new program started in FY03—the Moving Image Collections project. This project involves the development of a centralized database of moving image (film, video) archives from around the world. The project is funded by the National Science Foundation and the Library of Congress, and is being performed by IMTC in conjunction with Rutgers University and the University of Washington. IMTC also continued its partnership with one of its spin-off companies, Fast-Talk Communications, collaborating with the company on developing new products.

CENTER FOR SIGNAL AND IMAGE PROCESSING The Center for Signal and Image Processing (CSIP) is at the forefront of research and education in this important field. The laboratory boasts an outstanding, internationally known faculty; a large doctoral education program; an extensive selection of up-to-date courses; a wide-ranging research program in speech and image processing, DSP algorithms, hardware architectures, and DSP software; and excellent modern computer facilities for research and education. CSIP receives research support from a variety of funding sources; they include the GRA, NSF, DARPA, the U.S. Army Research Office, the Ballistic Missile Defense Organization, NASA, the John and Mary Franklin Foundation, Hewlett-Packard, Texas Instruments, IBM, Analog Devices, Intel, NCR, Lanier Worldwide, COMPASS Design Automation, Kodak, and the Region of Lorraine in France.

COMMUNICATIONS SYSTEMS CENTER The Communications Systems Center (CSC) has an active research program in the area of Internet-Protocol networks, digital two-way CATV, and wireless network systems. CSC personnel are also working on new technologies for improving Quality of Service, efficiency, and security on these networks. Ten graduate research assistants are involved in the CSC, and 14 have finished their Ph.D. work in the last four years.

The laboratory has a 4.5 meter C-band and K-band satellite antenna and digital receiver donated by Scientific-Atlanta, Inc. The pad construction was made possible by funds from the GRA and help from Turner Broadcasting. Industrial sponsorship is presently provided by Scientific-Atlanta. In the past, work has been sponsored by Lucent, Hitachi Telecom (USA), and PathFire. Presently, work is being done on communications network security for the U.S. Navy. New efforts are being started in the area of wireless network security. The CSC is led by its director, John A. Copeland.

ECE-FOUNDED STARTUPS GRADUATE FROM ATDC The Advanced Technology Development Center, a nationally recognized technology incubator that helps Georgia entrepreneurs launch and build successful companies, hosted its 13th annual Open House in May 2003. Despite difficult economic times on the high technology front, five startup companies officially graduated during this event, and the public learned the latest about products and services offered by the incubator's member firms.

Among the graduate companies, congratulated for their accomplishments measured by growth, investment, revenues, and liquidity events, were two companies founded by ECE faculty members. Fast-Talk Communications, founded by Mark A. Clements, has developed a unique search software for audio that enables extremely accurate, high-speed searching of both audio and video content. By focusing on identifying phonemes, the smallest unit of speech, the company can identify and retrieve any word, proper name, or phrase with high accuracy—without speech-to-text conversion. Lancope, Inc., founded by John A. Copeland, has created advanced threat protection solutions designed to combat advanced hacking exploits and corporate network misuse on enterprise networks. StealthWatch, the company's flagship product, is a behavior-based intrusion detection system that enables intelligent alarming, provides advanced network surveillance, operates at gigabit-speeds, recognizes unknown threats, and creates a forensic trail of network activity.

FUTURETRUCK Georgia Tech was among the 15 teams from U.S. and Canadian universities that competed in the fourth year of FutureTruck, held in June 2003 at Ford's Michigan Proving Grounds in Romeo, Mich. Dubbed as Model GT, the Georgia Tech team placed fourth and won first place in technical events—Acceleration, Customer Acceptability, and Emissions. In addition, the team tied for first place in the Trailer-Towing and Off-Road events. The Model GT team placed second in the Pre-Competition, Handling, Vehicle Design, and Malab/Simulink events. Comprised of undergraduate students in mechanical and electrical engineering, the team was advised by Jerome Meisel, an ECE visiting professor, and Gail Palmer, an ECE lecturer.

FutureTruck is a joint government-industry project created by the U.S. Department of Energy to explore alternative propulsion systems and fuels through student competition. The program's goal is to help raise the environmental performance of the popular SUV segment while keeping the amenities and features that have made the vehicle so popular with consumers.

LARGEST IEEE STUDENT BRANCH The international headquarters of the Institute of Electrical and Electronics Engineers (IEEE) named the Georgia Tech student branch of IEEE as the largest student branch in the world in 2002. Chris Wiczorek served as the organization's chair

during 2002-03, and the chapter advisor was John H. Matthews. The Georgia Tech IEEE student branch plays an active role in the daily life of ECE by hosting seminar speakers from various companies and organizations on a weekly basis. The group also sponsors a Student-Professional Awareness Conference each spring, and they participate in numerous competitions, as well as national and regional conferences. In March 2003, the IEEE hosted a special visit and presentation by Winifred Latimer Norman, the granddaughter of Lewis Latimer, a contemporary of both Alexander Graham Bell and Thomas Alva Edison.

FIRST LEGO LEAGUE COMPETITION Sixteen teams came from all parts of Georgia to square off in the FIRST LEGO League (FLL) Competition, which was held at SciTrek in November 2002 and co-hosted by Georgia Tech. Jeff Davis, an ECE assistant professor, and a team of 10-15 ECE students coordinated this event, along with Donna Whiting from the Georgia Tech Center for Integrating Science, Mathematics, and Computing. Robert Butera, an ECE assistant professor, and Tom Collins, an ECE instructor and a senior research engineer in the Georgia Tech Research Institute, served as technical presentation judges.

The theme of the 2002 competition was City Sights. Participating student teams designed and developed a FLL robot and used robotics technology to solve different missions that urban planners face in providing basic services such as housing, clean water, safe environment, educational and medical assistance, sustainable energy, mass transportation, and communication venues to the inhabitants of a city. With the help of LEGO's MINDSTORMS® Robotics Invention System™ technology, young participants attempted to build a robot and compete in a friendly, FIRST-style robotics event specially designed for their age group.

CHAIR PROFESSOR APPOINTMENTS Three new faculty members were hired into chair professorships during early fall 2002, while one longstanding ECE faculty member received a new professorship later in that semester. Gee-Kung Chang, the former vice president and chief technology strategist of OpNext, was named the Byers Endowed Professor in Optical Networking. Ramesh Jain was named the Rhesa "Ray" S. Farmer, Jr. Distinguished Chair in Embedded Experiential Systems and GRA Eminent Scholar. Chief technical officer and co-founder of PRAJA, Dr. Jain was also a Professor Emeritus at the University of California at San Diego. Biing-Hwang (Fred) Juang was named as Motorola Foundation Chair and GRA Eminent Scholar. Prior to coming to Georgia Tech, he was director of Multimedia Technologies Research for Avaya Labs. In November 2002, Thomas P. Barnwell was named as the Arbutus Chair in Distributed Engineering Education and GRA Eminent Scholar. Dr. Barnwell was also named as director for the newly established Arbutus Center for Distributed Engineering Education at the same time.

DUPUIS APPOINTMENT Russell D. Dupuis joined ECE in August 2003 as the Steve W. Chaddick Endowed Chair in Electro-optics and GRA Eminent Scholar and will be involved in the microsystems and optics and photonics areas. Before coming to Georgia Tech, he held the Judson S. Swearingen Regents Chair in Engineering in the Department of Electrical and Computer Engineering at the University of Texas at Austin, a position that he has held since 1989. Dr. Dupuis is a member of the National Academy of Engineering and Fellow of the IEEE and the Optical Society of America.

SAYLE RETIREMENT After 33 years of distinguished service, William E. Sayle retired as professor and associate chair for ECE Undergraduate Affairs in August 2003. Dr. Sayle began his career at Georgia Tech in 1970 and devoted it to teaching in the power electronics, microsystems, and electronic design and applications areas and in the overall development and promotion of engineering education. He received two ECE outstanding teacher awards and one Georgia Tech Outstanding Teacher Award and served as the chief advisor for the Georgia Tech chapter of Tau Beta Pi for 31 years, helping to produce not only technically competent, but also community service-minded engineers. During Dr. Sayle's 15-year tenure as associate chair for ECE Undergraduate Affairs, the School's reach grew from its Atlanta campus to Georgia Tech Lorraine and to the Georgia Tech Regional Engineering Program in southeast Georgia. He was also heavily involved in Georgia Tech faculty governance, via Institute level committees, the Academic Senate, and the Executive Board, and he championed diversity and recruitment of underrepresented minorities and women to engineering and science, long before it became a national issue.

PETERSON, WILLIAMS NAMED AS ASSOCIATE CHAIRS Andrew F. Peterson was named associate chair for ECE Faculty Development, effective July 2002. Dr. Peterson replaced Gary S. May, who now

serves as executive assistant to Georgia Tech President G. Wayne Clough. Dr. Peterson's new duties include management of the School's reappointment, promotion, tenure, and post tenure processes, as well as personnel retention, public relations, and development activities.

Douglas B. Williams was named as the new associate chair for ECE Undergraduate Affairs, succeeding William E. Sayle who retired in August 2003. Dr. Williams is responsible for undergraduate curriculum matters, student recruiting and advising, and continues as GTREP coordinator.

FACULTY PROMOTIONS Nine faculty members were promoted and/or tenured, effective July 1, 2002. James O. Hamblen, Bonnie S. Heck, Joy Laskar, and Yorai Y. Wardi were promoted to professor. A. Bruno Frazier was promoted to associate professor and tenured. Madhavan Swaminathan was promoted to professor and also received tenure. Douglas M. Blough, Stephen E. Ralph, and Krishna V. Palem received tenure.

Six faculty members were promoted and/or tenured, effective July 1, 2003. John A. Buck, Stephen P. DeWeerth, Joseph L.A. Hughes, and D. Scott Wills were promoted to professor. Paul E. Hasler and Linda M. Wills were promoted to associate professor and tenured.

In Loving Remembrance



Daniel C. Fielder
Professor Emeritus
1917-2002



Carl M. Verber
Professor Emeritus
1935-2002



John P. Uyemura
Professor
1952-2003



Kevin F. Brennan
Byers Professor in
Microelectronics
1956-2003

In October 2002, ECE lost two of its Professors Emeriti, Daniel C. Fielder and Carl M. Verber; both men died after enduring long illnesses. Dr. Fielder enjoyed a 50-plus-year teaching career in ECE and was one of the School's earliest pioneers, while Dr. Verber was one of the international giants in optics and photonics and a beloved mentor of numerous graduate students and junior faculty.

In February 2003, John P. Uyemura, professor in the microsystems and electronic design and applications areas, died suddenly of a heart attack. He left a lasting legacy on his students whom he taught with much energy and passion and on his faculty and staff colleagues who deeply respected his great intellect, generosity, and sense of humor.

At the end of summer semester 2003, Kevin F. Brennan, Byers Professor in Microelectronics, died after a long battle with cancer. Dr. Brennan set the bar high for what a faculty member can achieve, while retaining the respect, support, and camaraderie of his academic colleagues and his own graduate students, practically all he called his friends.

One hundred and fifteen faculty members were employed in ECE during 2002-03. Ten new faculty members were hired, one faculty member resigned, and three faculty members died. Six faculty members were associated with the Georgia Tech Regional Engineering Program (GTREP).

Andrew F. Peterson was named as associate chair for ECE Faculty Development in July 2003, succeeding Gary S. May, who now serves as executive assistant to Georgia Tech President G. Wayne Clough.

Eight new faculty members joined ECE for the start of fall semester 2002, including three who hold endowed chair titles. Gee-Kung Chang is the Byers Endowed Chair in Optical Networking and is involved in the telecommunications and optics and photonics technical interest groups; Ramesh Jain, Rhesa Ray S. Farmer, Jr. Distinguished Chair in Embedded Experiential Systems and Georgia Research Alliance (GRA) Eminent Scholar, is a member of the computer engineering group; and Bing-Hwang (Fred) Juang, Motorola Foundation Chair Professor and GRA Eminent Scholar, is in the digital signal processing (DSP) and telecommunications groups. Also joining ECE at this time were John D. Cressler as a professor in the microsystems and electronic design and applications areas, while Jennifer E. Michaels and Thomas E. Michaels were hired as associate professors in the systems and controls area. Hsien-Hsin Sean Lee joined the computer engineering area as an assistant professor, and Chin-Hui Lee joined the computer engineering and DSP areas as a professor.

During October 2002, ECE lost two of its Professors Emeriti, Daniel C. Fielder and Carl M. Verber; both men died after enduring long illnesses. Dr. Fielder enjoyed a 50-plus-year teaching career in ECE and was one of the School's earliest pioneers, while Dr. Verber was one of the international giants in optics and photonics and a beloved mentor of numerous graduate students and junior faculty. In December 2002, ECE bid farewell to Mark J.T. Smith, a professor in the DSP area and former executive assistant to Georgia Tech President G. Wayne Clough. Dr. Smith became the head of the School of Electrical and Computer Engineering at Purdue University in January 2003.

During spring semester 2003, one faculty member was hired, and one faculty member died unexpectedly. In January 2003, Oliver Brand joined the faculty as an associate professor in the microsystems technical interest group. In February 2003, John P. Uyemura, professor in the microsystems and electronic design and applications areas, died suddenly of a heart attack. He left a lasting legacy on his students whom he taught with much energy and passion and on his faculty and staff colleagues who deeply respected his great intellect, generosity, and sense of humor.

At the end of summer semester 2003, Kevin F. Brennan, Byers Professor in Microelectronics, died after a long battle with cancer. Dr. Brennan set the bar high for what a faculty member can achieve, while retaining the respect, support, and camaraderie of his academic colleagues and his own graduate students, practically all he called his friends.

GTREP faculty members, Randal T. Abler, Christopher F. Barnes, Ashraf Saad, Feodor Vainstein, and Rahman Zaghoul are based in Savannah, GA, but frequently visit the main Georgia Tech campus either in person or via teleconference. Joel R. Jackson is based at the Atlanta campus, serving online distance learning needs in the ECE curricula and continuing education. Dr. Barnes joined the GTREP faculty in fall 2002.

Seventy percent of the ECE faculty is tenured, with all members

holding doctorates. The table to the right summarizes the academic ranks and the ethnic and gender composition of the faculty. A list of the faculty members and their research interests is also included in this section.

REGENTS' PROFESSORS

Thomas K. Gaylord

Julius Brown Chair Professor

Ph.D., Rice University

Research interests: *Diffractive optics; optical interconnects; fiber optic devices; optics instrumentation; semiconductor quantum devices; nanostructure optoelectronics*

Russell M. Mersereau

Sc.D., Massachusetts Institute of Technology

Research interests: *Enhancement, modeling, and coding of computerized images and video; DSP for communications; acoustic arrays for echo removal and object tracking; pattern recognition*

Ajeet Rohatgi

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

Research interests: *Modeling and fabrication of low-cost high-efficiency silicon solar cells; growth and characterization of low-temperature and high-performance dielectrics; defects and carrier lifetime in semiconductors; rapid thermal processing of silicon devices; growth and optoelectronic properties of compound semiconductors*

Ronald W. Schafer

Institute Professor and John and Marilu McCarty Chair of Electrical Engineering

Ph.D., Massachusetts Institute of Technology

Research interests: *Nonlinear signal processing systems; speech processing and multimedia systems; DSP in medicine and biology research; DSP for communications*

Glenn S. Smith

John Pippin Chair in Electromagnetics

Ph.D., Harvard University

Research interests: *Basic electromagnetic theory and measurements; antennas and wave propagation in materials; radiation and reception of pulses by antennas*

PROFESSORS

Ian F. Akyildiz

Byers Professor in Telecommunications

Ph.D., University of Erlangen

Research interests: *Wireless networks; satellite networks; next generation Internet*

Mark G. Allen

Joseph M. Pettit Professor in Microelectronics
 Ph.D., Massachusetts Institute of Technology
 Research interests: *Micromachining; microsensor and microactuator fabrication compatible with integrated circuit (IC) fabrication; microelectromechanical systems (MEMS)*

Phillip E. Allen

Schlumberger Chair Professor in Microelectronics
 Ph.D., University of Kansas
 Research interests: *Analog IC design; analog filters; analog modeling and computer-aided design (CAD); analog circuits and systems for telecommunication applications*

Thomas P. Barnwell, III

Director of the Arbutus Center for Distributed Engineering Education, Arbutus Distinguished Chair in Distributed Engineering Education, and GRA Eminent Scholar
 Ph.D., Massachusetts Institute of Technology
 Research interests: *Computer-enhanced education; speech analysis, synthesis, and coding; multiprocessor architectures for DSP; DSP algorithms; objective speech quality measures*

Douglas M. Blough

Co-Director of the Center for Experimental Research in Computer Systems
 Ph.D., The Johns Hopkins University
 Research interests: *Multicomputer architecture; fault-tolerant computer systems; operating systems and middleware*

Kevin F. Brennan (Deceased August 2003)

Byers Professor in Microelectronics
 Ph.D., University of Illinois at Urbana-Champaign
 Research interests: *High field carrier transport in semiconductors; optoelectronic device physics; transport properties and device potential of wide band gap semiconductors; electronic device modeling and theory*

W. Russell Callen, Jr.

Ph.D., Stanford University
 Research interests: *Engineering educational methods; integration of engineering and the humanities; professional engineering education*

Gee-Kung Chang

Byers Endowed Professor in Optical Networking
 Ph.D., University of California at Riverside
 Research interests: *Optoelectronic and photonic subsystems; optical networks and systems; optical networking technologies; next generation optical Internet*

Mark A. Clements

Director of the Interactive Media Technology Center
 Sc.D., Massachusetts Institute of Technology
 Research interests: *DSP and analysis; speech recognition; analysis and compensation of stress in speech; sensory aids for the hearing impaired; pattern recognition*

FACULTY PROFILE	
RANK	
Regents Professors.....	5
Professors.....	57
Associate Professors.....	30
Assistant Professors.....	23
Total*	115
TENURED	
Regents Professors.....	5
Professors.....	54
Associate Professors.....	21
FEMALE AND MINORITY REPRESENTATION	
Female.....	9
African-American.....	2
Asian.....	21
Hispanic.....	1
Multi-racial.....	1
* Includes GTREP faculty	

John A. Copeland

John H. Weitnauer, Jr. Technology Transfer Chair, GRA Eminent Scholar, and Director of the Communications Systems Center
 Ph.D., Georgia Institute of Technology
 Research interests: *Computer communication networks; digital cable television networks; computer architecture and operating systems*

John D. Cressler

Ph.D., Columbia University
 Research interests: *Silicon-germanium (SiGe) microelectronic devices and technology; Si-based RF/microwave/millimeter-wave heterostructure devices and circuits; radiation effects in electronics; cryogenic electronics; silicon-carbide (SiC) microelectronic devices and technology; transistor-level numerical simulation and compact circuit modeling*

John F. Dorsey

Ph.D., Michigan State University
 Research interests: *Modeling and control of large-scale systems; real time identification of parameters of power system models; online power system security assessment; elimination of sustained oscillations in power systems; effect on stability of nonutility generation*

Robert K. Feeney

Ph.D., Georgia Institute of Technology
 Research interests: *CAD and fabrication of printed-circuit-phased-array antennas; integration of advanced monolithic microwave ICs with microwave antennas; CAD for radio frequency (RF) and microwave circuit analysis and design*

Ian T. Ferguson

Ph.D., University of St. Andrews in Scotland
 Research interests: *Solid state lighting; LEDs/lasers for UV and biomedical applications; MOCVD growth and fabrication of GaN-based materials; intelligent epitaxy; spintronics; entrepreneurship*

Elias N. Glytsis

Ph.D., Georgia Institute of Technology
 Research interests: *Diffractive optics; optical interconnections; integrated and fiber optic devices; numerical techniques in electromagnetic problems*

Thomas G. Habetler

Ph.D., University of Wisconsin at Madison
 Research interests: *Current-based condition monitoring of electric machines; control of electric machine drives; power electronics; design and protection of electric machines*

James O. Hamblen

Ph.D., Georgia Institute of Technology
 Research interests: *Rapid prototyping; embedded systems; computer architecture; CAD*

Ronald G. Harley

Duke Power Company Distinguished Professor
 Ph.D., London University
 Research interests: *Power system stability and control, including flexible AC systems devices; power electronics, motor drives, and electric vehicles; neural networks applied to power electronics and electrical machines*

Monson H. Hayes, III

Sc.D., Massachusetts Institute of Technology
 Research interests: *Stereo image processing; face and gesture recognition; multimedia signal processing; adaptive signal processing; Internet education*

Bonnie S. Heck

Ph.D., Georgia Institute of Technology
 Research interests: *Control theory; power electronics; software architecture for control systems*

David R. Hertling

Associate Chair for ECE Graduate Affairs
 Ph.D., University of Illinois at Urbana-Champaign
 Research interests: *Modeling of linear and non-linear active devices; CAD and analysis of electronic circuits; CAD of planar dipole phased antenna arrays*

William D. Hunt

Ph.D., University of Illinois at Urbana-Champaign
 Research interests: *Thin film piezoelectric materials; surface acoustic wave and bulk acoustic wave devices for wireless applications; microelectronic acoustics in chemical sensing and biological research; device physics and fabrication of microelectronic acoustic devices*

Ramesh C. Jain

Rhesa Ray S. Farmer, Jr. Distinguished Chair in Embedded Experiential Systems and GRA Eminent Scholar
 Ph.D., Indian Institute of Technology at Kharagpur
 Research interests: *Multimedia information systems; image databases; machine vision; intelligent systems*

Nikil S. Jayant

Executive Director for the Georgia Centers for Advanced Telecommunications Technology, Director of the Georgia Tech Broadband Institute, John Pippin Chair in Wireless Systems, and GRA Eminent Scholar
 Ph.D., Indian Institute of Science, Bangalore
 Research interests: *Signal compression; multimedia communications; wireless systems; broadband access*

Nan Marie Jokerst

Joseph M. Pettit Professor in Electro-optics
 Ph.D., University of Southern California
 Research interests: *Integrated optoelectronic links; integrated microsystems and nanosystems; optical network interfaces and imaging systems; alignment tolerant high performance optoelectronic interfaces*

Biing-Hwang (Fred) Juang

Motorola Foundation Chair Professor and GRA Eminent Scholar
 Ph.D., University of California at Santa Barbara
 Research interests: *Speech processing, including recognition, synthesis, coding, and enhancement; multi-channel and array signal processing; stochastic modeling of signal and data sequence; signal processing for communications; multimedia and multimodal communications*

Joy Laskar

Yamacraw Research Director and Joseph M. Pettit Professor in Electronics
 Ph.D., University of Illinois at Urbana-Champaign
 Research interests: *RF and microwave ICs in CMOS, SiGe, GaAs, and InP; integration and packaging techniques for RF/microwave applications; next generation IC applications in 4G wireless and hybrid RF/optoelectronic ICs*

W. Marshall Leach, Jr.

Ph.D., Georgia Institute of Technology
 Research interests: *Electroacoustic modeling of transducers; audio signal processing; analog circuit design; low-noise electronics; electromagnetics*

Chin-Hui Lee

Ph.D., University of Washington
 Research interests: *Speech and speaker recognition; multimedia signal and information processing; speech and language understanding; spoken dialogue processing; pattern recognition; machine learning; biometric authentication; multimodal access; information retrieval and text categorization*

James H. McClellan

Byers Professor in Digital Signal Processing
 Ph.D., Rice University
 Research interests: *Computer technology applied to education; sensor array signal processing; radar signal processing; software for DSP*

Vijay K. Madisetti

Ph.D., University of California at Berkeley
 Research interests: *Embedded software systems; digital system design; VLSI systems; system-on-package and system-on-chip technologies; DSP hardware and software*

Gary S. May

Executive Assistant to President G. Wayne Clough and Motorola Foundation Professor
Ph.D., University of California at Berkeley
Research interests: *Computer-aided manufacturing of ICs and devices; monitoring, modeling, simulation, control, and diagnosis of semiconductor fabrication processes; IC design for manufacturability; IC yield modeling; computer-enhanced education*

James D. Meindl

Joseph M. Pettit Chair in Microelectronics and Director of the Microelectronics Research Center
Ph.D., Carnegie-Mellon University
Research interests: *Microelectronics; gigascale integration (GSI)*

A.P. Sakis Meliopoulos

Ph.D., Georgia Institute of Technology
Research interests: *Power system reliability and risk assessment; power systems operations planning; electromagnetic influence of power systems; power quality; protective relaying and disturbance analysis; simulation, animation, and visualization of power systems*

Krishna V. Palem

Director, Center for Research in Embedded Systems and Technology
Ph.D., University of Texas at Austin
Research interests: *Adaptive hardware, compiler optimizations for instruction level parallel processors; embedded and fault-tolerant systems; parallel computing, programmable memory hierarchies, and smart caches; real-time systems, string, and pattern matching*

John B. Peatman

Ph.D., Case Western Reserve University
Research interests: *Development of low-cost tools for the design of microcontroller applications; embedded microcontroller applications*

Andrew F. Peterson

Associate Chair for ECE Faculty Development
Ph.D., University of Illinois at Urbana-Champaign
Research interests: *Computational electromagnetics; radar signature prediction; signal integrity in electronic packaging applications; antennas and microwave devices*

Hans B. P ttgen

Associate Chair for ECE External Affairs; President of Georgia Tech Lorraine; Director of the National Electric Energy Testing, Research, and Applications Center; and Georgia Power Distinguished Chair
Ph.D., University of Florida
Research interests: *Power systems analysis and planning; utility deregulation; electric transportation vehicles and systems*

William T. Rhodes

Ph.D., Stanford University
Research interests: *Image formation; partially coherent optical systems; Fourier optics; information processing and telecommunications; secure communication technology*

William E. Sayle

Associate Chair for ECE Undergraduate Affairs
Ph.D., University of Washington
Research interests: *Power electronics devices and circuits; analog electronics*

Jay H. Schlag

Associate Chair for ECE Operations
Ph.D., Georgia Institute of Technology
Research interests: *Computer applications; CAD; neural networks*

Waymond R. Scott, Jr.

Ph.D., Georgia Institute of Technology
Research interests: *Methods for detecting buried objects using both electromagnetic and acoustic waves; measurement of electromagnetic properties of materials; transient electromagnetic fields; numerical methods including the finite element and the finite-difference time-domain techniques*

Mark J.T. Smith

Ph.D., Georgia Institute of Technology
Research interests: *Image and video processing; telemedicine; object detection and reception; data compression for transmission and storage*

Paul G. Steffes

Ph.D., Stanford University
Research interests: *Microwave systems for remote sensing of planetary atmospheres and surfaces; microwave and millimeter-wave properties of terrestrial and planetary atmospheres; satellite communications and navigation systems; spectrum allocation and usage; non-invasive monitoring of glucose in the human body; radio astronomy*

Gordon L. St ber

Joseph M. Pettit Professor in Communications
Ph.D., University of Waterloo
Research interests: *Wireless physical communications; cellular mobile radio systems; broadband wireless access systems*

Madhavan Swaminathan

Ph.D., Syracuse University
Research interests: *Numerical methods in electromagnetics; interconnect design and analysis; power distribution for GHz systems; time domain characterization methods; IC package co-design*

Allen Tannenbaum

Julian Hightower Professor
Ph.D., Harvard University
Research interests: *Computer vision; image processing; computer graphics; control theory; cryptography; biomedical imaging*

David G. Taylor

Director of the Center for Board Assembly Research and Associate Director of the Manufacturing Research Center
Ph.D., University of Illinois at Urbana-Champaign
Research interests: *Nonlinear control systems; electromechanical systems and devices; modeling, simulation, and control of assembly robots; design and control of linear motion actuators and generators*

Rao R. Tummala

Director of the Packaging Research Center, Joseph M. Pettit Chair in Electronics Packaging, and GRA Eminent Scholar
Ph.D., University of Illinois at Urbana-Champaign
Research interests: *Microelectronics systems packaging; electronic materials; display technologies; magnetic storage*

John P. Uyemura (Deceased February 2003)

Ph.D., University of California at Berkeley
Research interests: *10/100 GBs CMOS circuits for ethernet applications; phase-locked and delay-locked loops; high-speed, dual-rail CMOS VLSI logic networks; optical telecommunication circuits and systems*

George J. Vachtsevanos

Ph.D., The City University of New York
Research interests: *Hierarchical/intelligent control of large-scale industrial processes; fault-tolerant and mode transitioning control of unmanned aerial vehicles; vision- and IR-based inspection technologies for textile, glass, and other industrial products; analysis of EEG signals for detection and prediction of epileptic seizures; sensor fusion techniques for classification and control*

Erik I. Verriest

Ph.D., Stanford University
Research interests: *Mathematical system theory; algorithms for optical signal processing; effects of finite precision on control; model reduction; stochastic realization theory; data compression*

Yorai Y. Wardi

Ph.D., University of California at Berkeley
Research interests: *Analysis and optimization of discrete event dynamical systems; gradient estimation via simulation; modeling for rapid simulation of high-speed networks; optimal control of manufacturing systems*

Roger P. Webb

Steve W. Chaddick School Chair
Ph.D., Georgia Institute of Technology
Research interests: *Electric power systems; instrumentation; control systems*

Sudhakar Yalamanchili

Co-Director, Center for Experimental Research in Computer Systems
Ph.D., University of Texas at Austin
Research interests: *Customizable hardware/software for embedded platforms; design and analysis of interconnection networks; cluster computing architectures*

ASSOCIATE PROFESSORS

John R. Barry

Ph.D., University of California at Berkeley
Research interests: *Communication theory; coding, equalization, and synchronization; wireless communications; signal processing for multiuser systems*

Miroslav M. Begovic

Ph.D., Virginia Polytechnic Institute and State University
Research interests: *Wide area disturbances in transmission networks;*

distributed energy resources in power systems; sustainable energy systems; distribution network analysis; applications of DSP to power system protection

Oliver Brand

Ph.D., ETH-Zurich
Research interests: *Micromachining, MEMS, micro, and nano systems technology; microsensors for physical, chemical, and biological applications; microsensor fabrication based on IC technologies; microsystem packaging*

Martin A. Brooke

Ph.D., University of Southern California
Research interests: *High-speed, high performance signal processing*

John A. Buck

Ph.D., University of California at Berkeley
Research interests: *Nonlinear pulse propagation in optical fibers and fiber amplifiers*

Abhijit Chatterjee

Ph.D., University of Illinois at Urbana-Champaign
Research interests: *VLSI and mixed-signal testing; fault tolerant computing; low power circuit design; computer algorithms; digital automation*

David S. Citrin

Ph.D., University of Illinois at Urbana-Champaign
Research interests: *Nonlinear optical properties of semiconductor materials and devices; high-speed electronic, photonic, and optoelectronic devices; quantum computing; ultrahigh speed, all-optical switching; terahertz technology*

Stephen P. DeWeerth

Ph.D., California Institute of Technology
Research interests: *Neuromorphic engineering; hybrid neuronal-MEMS systems; biologically-inspired sensorimotor systems and motor learning; analog VLSI circuits and systems; smart sensors; remote interfacing to embedded systems*

K.-H. Michael Fan

Ph.D., University of Maryland
Research interests: *Video compression; nonlinear optimization; system theory; computer-aided engineering system design; robust control*

A. Bruno Frazier

Ph.D., Georgia Institute of Technology
Research interests: *Micromachining, MEMS, and microsystems technology; biomedical microsystems; integrated biodetection systems; microsystems fabrication technologies*

Christiana B. Honsberg

Ph.D., University of Delaware
Research interests: *Design, development, and characterization of novel, commercially-oriented solar cell structures using buried contact technology; identification, modeling, and analysis of novel techniques to overcome traditional homojunction or two-stack tandem efficiency limits; GaAs solar cells*

Joseph L.A. Hughes

Associate Chair for Computer Engineering and ECE Program Development (Effective fall 2003, Dr. Hughes' new title will be Associate Chair for ECE Academic Operations)
Ph.D., Stanford University
Research interests: *IC testing; VLSI system design; optical communication networks; educational program assessment*

Mary Ann Ingram

Ph.D., Georgia Institute of Technology
Research interests: *Wireless communications systems; RF propagation measurements and modeling; array signal processing; antenna pattern synthesis*

Chuanyi Ji

Ph.D., California Institute of Technology
Research interests: *Management and control of heterogeneous and large networks; adaptive algorithms, statistics, and information theory*

David C. Keezer

Ph.D., Carnegie-Mellon University
Research interests: *Test methods for high performance electronic systems; design of high-speed logic systems; advanced electronics packaging methods; computer applications for music*

J. Stevenson Kenney

ON Semiconductor Junior Professor
Ph.D., Georgia Institute of Technology
Research interests: *RF and microwave power amplifier design; behavioral simulation of RF and microwave components; advanced RFIC design; microwave transmission and propagation*

Arthur Koblasz

Ph.D., California Institute of Technology
Research interests: *Rehabilitation engineering; medical diagnostic protocols*

Ye (Geoffrey) Li

Ph.D., Auburn University
Research interests: *Wireless communications; adaptive signal processing*

Steven W. McLaughlin

Ph.D., University of Michigan at Ann Arbor
Research interests: *Communications and information theory; error control coding; coding and signal processing for magnetic and optical storage and fiber optic transmission systems; source coding and data compression*

Jennifer E. Michaels

Ph.D., Cornell University
Research interests: *Ultrasonic testing of components and structures; nondestructive materials characterization; digital signal processing applied to measurement processes; sensors and measurement systems; robotics and motion controls for automated measurements*

Thomas E. Michaels

Ph.D., Washington State University
Research interests: *Nondestructive evaluation of components and structures; materials characterization using ultrasonic methods;*

development of instrumentation and controls for automated testing; DSP of ultrasonic signals; measurement technology and sensor development

Linda S. Milor

Ph.D., University of California at Berkeley
Research interests: *Circuit performance (speed) modeling and prediction; analog and mixed-signal testing; yield modeling and prediction; modeling of process modules; statistical process modeling and characterization; digital testing*

Henry L. Owen

Ph.D., Georgia Institute of Technology
Research interests: *Internetworking; computer networks; quality of service in the Internet; network protocol implementations in operating systems*

Stephen E. Ralph

Ph.D., Cornell University
Research interests: *Ultrafast optical devices for high-speed optical communications; ultrafast processes in photonic devices; all-optical switching; optical telecommunications networks; optical materials and phenomena for optical signal processing*

David E. Schimmel

Ph.D., Cornell University
Research interests: *Parallel computer architecture and reconfigurable computing; VLSI system design; system area computer network design; asynchronous and self-timed system design*

Douglas B. Williams

Associate Chair for ECE Undergraduate Affairs (Effective Fall 2003)
Ph.D., Rice University
Research interests: *Statistical signal processing; signal processing techniques for communications; adaptive radar signal processing; applications of chaos and nonlinear dynamics to communications*

D. Scott Wills

Sc.D., Massachusetts Institute of Technology
Research interests: *Portable multimedia supercomputers; short wire VLSI architectures; GSI system modeling; parallel computing; embedded SIMD architectures; high efficiency computation; multicomputer interconnection networks*

G. Tong Zhou

Ph.D., University of Virginia
Research interests: *Statistical signal processing; signal processing for communications applications; DSP-based power amplifier linearization; network traffic analysis; seismic deconvolution; bio-signal analysis*

ASSISTANT PROFESSORS

Ali Adibi

Ph.D., California Institute of Technology
Research interests: *Holographic data storage; holographic optical elements for optical communications; design, characterization, and applications of photonic crystals; optical communication and networking*

Yucel Altunbasak

Ph.D., University of Rochester

Research interests: *Multimedia processing and communications; scalable video coding, high definition television, Internet video, and wireless video; audio-visual information management; 3-D graphics streaming; inverse problems in signal processing*

David V. Anderson

Ph.D., Georgia Institute of Technology

Research interests: *DSP for speech and audio enhancement; signal processing for the hearing impaired; ultra-low power signal processing systems; Internet-based engineering education*

Farrokh Ayazi

Ph.D., University of Michigan at Ann Arbor

Research interests: *Integrated MEMS; RF MEMS; VLSI analog/mixed-mode circuits for sensor readout and control; integration of high aspect-ratio silicon technologies with CMOS circuits; high-precision inertial sensing microsystems*

Robert J. Butera, Jr.

Ph.D., Rice University

Research interests: *Neural control of breathing; pattern-generating neural circuits; real-time computing applied to electrophysiology; nonlinear dynamics in electronic circuits; nonlinear dynamics in biological circuits*

Jeffrey A. Davis

Ph.D., Georgia Institute of Technology

Research interests: *System-level interconnect prediction; interconnect limits for GSI; compact distributed RLC interconnect device modeling; interconnect-centric design methodologies; on-chip high speed networks and optimal multilevel network design*

W. Alan Doolittle

Ph.D., Georgia Institute of Technology

Research interests: *Wide bandgap semiconductor materials and devices; dielectric materials growth and characterization; electrical, optical, and structural characterization and optimization of electronic materials and devices; microelectronic device/circuit fabrication; RF power electronic devices*

Magnus Egerstedt

Ph.D., Royal Institute of Technology, Stockholm, Sweden

Research interests: *Hybrid automata theory; robotics, optimal control; complexity issues in control*

Faramarz Fekri

Ph.D., Georgia Institute of Technology

Research interests: *Error control coding; wavelets; cryptography; digital communications; DSP for communications*

Paul E. Hasler

Ph.D., California Institute of Technology

Research interests: *Mixed-signal ICs; floating-gate metal-oxide-semiconductor transistors for smart interfaces with MEMS sensors; low power electronics; analog VLSI models of on-chip learning and sensory processing in neurobiology*

Aaron D. Lanterman

Ph.D., Washington University in St. Louis

Research interests: *Target recognition; image reconstruction; radar systems*

Hsien-Hsin Sean Lee

Ph.D., University of Michigan at Ann Arbor

Research interests: *Computer architecture, compiler optimization, low-energy computing system design, performance modeling analysis techniques, parallel processing, computer graphics*

Sung Kyu Lim

Ph.D., University of California at Los Angeles

Research interests: *VLSI CAD; performance driven logic synthesis and physical design; low power oriented logic synthesis and physical design; high-speed interconnect modeling and optimization; fundamental CAD algorithms; combinatorial optimization*

Vincent J. Mooney, III

Ph.D., Stanford University

Research interests: *System level design; hardware-software co-design; synthesis of reconfigurable architectures; logic synthesis; application-specific system design; low-power architectures, modeling, and compilers*

Ioannis (John) Papapolymerou

Ph.D., University of Michigan

Research interests: *Monolithic microwave/millimeter wave integrated circuits; silicon micromachining for high-frequency applications; RF/microwave MEMS; EBG structures; packaging and wireless interconnects; W-band transmit/receive modules*

George F. Riley

Ph.D., Georgia Institute of Technology

Research interests: *Distributed discrete event simulation techniques; large-scale computer networks; distributed computing; operating systems; communications front-end processors*

Gabriel Rinc n-Mora

Ph.D., Georgia Institute of Technology

Research interests: *Precision low-voltage/low-power analog circuit design; low-noise analog circuit design; high performance power management integrated circuits; mixed-signal IC/layout design techniques*

Raghupathy Sivakumar

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

Research interests: *Computer networks; wireless networks; mobile computing; network quality of service*

Emmanouil M. Tentzeris

Ph.D., University of Michigan at Ann Arbor

Research interests: *Real-time multiresolution algorithms for analysis and design of wireless communication front-ends; RF packaging; RF MEMS; antenna integration techniques; adaptive transient analysis of active circuits*

Linda M. Wills

Demetrius T. Paris Professor
 Ph.D., Massachusetts Institute of Technology
 Research interests: *Reverse engineering existing systems for redesign and reuse; retargeting multimedia software to data parallel architectures; dynamically reconfigurable, self-adaptive software; rapid prototyping of real-time embedded systems; interactive architectural simulators for educational use*

Anthony J. Yezzi, Jr.

Ph.D., University of Minnesota
 Research interests: *Image processing; computer vision; estimation and control; computation and algorithms; applied differential geometry*

GTREP FACULTY

Randal T. Abler, Assistant Professor

Ph.D., Georgia Institute of Technology
 Research interests: *Quality of service in IP networks; multi-protocol label switching; IP delivery of multimedia content in the educational environment*

Christopher F. Barnes, Associate Professor

Ph.D., Brigham Young University
 Research interests: *Information and communication theory, DSP in radar and sonar, synthetic aperture imaging, pattern recognition and machine learning, high performance computing for radar and sonar*

Joel R. Jackson, Assistant Professor

Ph.D., Georgia Institute of Technology
 Research interests: *DSP with applications in medical imaging and remote sensing; DSP education; sonoelasticity imaging; embedded medical imaging devices; use of context-aware wireless devices for enhanced learning systems*

Ashraf Saad, Associate Professor

Ph.D., Vanderbilt University
 Research interests: *Intelligent evolutionary systems; robotics; agent- and multiagent-based systems; mobile agents; artificial intelligence in education*

Feodor Vainstein, Professor

Ph.D., Boston University
 Research interests: *Fault-tolerant computing; computer hardware and software testing; computer hardware design; digital communication and error-correcting codes; applied mathematics and control*

Rahman Zaghoul, Professor

Ph.D., University of Nebraska at Lincoln
 Research interests: *Semiconductor materials characterization; novel cognitive-enabling educational environments; applications to machine learning, problem solving, robotics, and decision making under stressed conditions*

PROFESSORS EMERITI
 AND LENGTH OF SERVICE

Cecil O. Alford	1968-98
Henry C. Bourne	1982-92
Aubrey Bush	1965-92 (Now employed with GCATT)
J. Alvin Connelly	1968-2001 (Employed with ECE on a part-time basis)
Daniel C. Fielder	1948-88 (Deceased October 2002)
Joseph L. Hammond	1955-84 (Now employed with Clemson University)
Richard J. Higgins	1987-99
John W. Hooper	1957-88
Edward B. Joy	1970-98 (Employed with ECE on a part-time basis)
Edward W. Kamen	1971-80, 1991-2002
Richard P. Kenan	1986-99
Mohamed F. Moad	1963-2001 (Employed with ECE on a part-time basis)
Dale C. Ray	1966-99
George P. Rodrigue	1968-96
Kendall L. Su	1954-94 (Employed with ECE on a part-time basis)
Carl M. Verber	1986-2000 (Deceased October 2002)
Thomas M. White	1948-88 (Employed with ECE on a part-time basis)

JOINT FACULTY APPOINTMENTS

James Foley, Associate Dean, Professor, and Stephen Fleming Chair in Telecommunications; College of Computing
Yogendra Joshi, Professor, Woodruff School of Mechanical Engineering

ADJUNCT AND
 PART-TIME APPOINTMENTS

Emmanuel Anemogiannis, Nortel Networks
Paul J. Benkeser, Wallace H. Coulter Department of Biomedical Engineering
Daniel J. Blumenthal, University of California at Santa Barbara
David E. Bockelman, Free Electron Technology
Bertrand Bousert, Georgia Tech Lorraine
Catherine Brechignac, Centre National De La Recherche Scientifique
Marijn Brummer, Emory University
Brian Butka, Integrated Device Technology
Donald D. Davis, Antec Corp.
Jim D. Echard, Georgia Tech Research Institute
Robert Eisner, Emory University
Irfan Essa, College of Computing
Gary G. Gimmestad, Georgia Tech Research Institute
Jean-Pierre Goedgebuer, Georgia Tech Lorraine

- Mathieu Hans**, Hewlett-Packard Co.
Nile F. Hartman, Georgia Tech Research Institute (Retired)
E. Jefferson Holder, Georgia Tech Research Institute
Michele L. Jamrozik, Georgia Tech Lorraine
Fred Kitson, Hewlett-Packard
Bob Lee, The Wallace H. Coulter Department of Biomedical Engineering at Georgia Tech/Emory University
Y.-L. Li, Intel
John O. Limb, Broadcom
Fran ois J. Malassenet, Georgia Tech Lorraine
John H. Matthews, John H. Matthews and Associates, Inc.
Kenneth M. Mackenzie, College of Computing
Bill McKinnon, Georgia Tech Research Institute
Robert McNally, Cryolife, Inc.
Jerome Meisel, Georgia Tech
William L. Melvin, Georgia Tech Research Institute
Stephen C. Mettler, Lucent Technologies
J.W. Monaco, Line Imaging Systems
Romain Murenzi, Clark Atlanta University
William R. Owens, Georgia Tech Research Institute
Umakishore Ramachandran, College of Computing
Craig Richardson, ASPI Digital
Tariq Samad, Honeywell
Karsten Schwan, College of Computing
Robert E. Schwerzel, Georgia Tech Research Institute
Oskar Skrinjar, The Wallace H. Coulter Department of Biomedical Engineering at Georgia Tech/Emory University
Christopher Summers, School of Materials Science and Engineering
John D. Terry, Nokia
Kwan K. Truong, ASPI Digital
May Wang, The Wallace H. Coulter Department of Biomedical Engineering at Georgia Tech/Emory University
Gisele Welch, Georgia Tech Research Institute
Stephen B. Wicker, Cornell University

FACULTY SERVICE ON INSTITUTE GOVERNING BODIES AND COMMITTEES

Georgia Tech has several governing bodies and standing committees that shape and administer Institute policies. These groups include the Institute Executive Board, the Academic Senate, and the General Faculty; six general faculty standing committees and eight academic faculty standing committees study issues and make policy recommendations.

During 2002-03, 17 ECE academic and general faculty members were involved in academic government, three who served as committee chairs—Paul G. Steffes for the Institute Faculty Honors Committee, Mark A. Richards for the Institute Faculty Status and Grievance Committee, and Joseph L.A. Hughes for the Institute Undergraduate Curriculum Committee.

Executive Board

Andrew F. Peterson

Academic Senate

Jeffrey A. Davis	Thomas G. Habetler
Joseph L.A. Hughes	William E. Sayle
D. Scott Wills	

General Faculty Assembly

Jeffrey A. Davis	Thomas G. Habetler
Joseph L.A. Hughes	Mark A. Richards
William E. Sayle	D. Scott Wills

General Faculty Standing Committees

<i>Faculty Honors</i>	Paul G. Steffes*
<i>Faculty Status & Grievance</i>	Mark A. Richards* Erik I. Verriest
<i>Welfare and Security</i>	Mary Ann Ingram Frank Lambert Gail O. Palmer

Academic Faculty Standing Committees

<i>Undergraduate Curriculum</i>	Jeffrey A. Davis Joseph L.A. Hughes* D. Scott Wills
<i>Graduate Curriculum</i>	Stephen P. DeWeerth Monson H. Hayes, III William D. Hunt Andrew F. Peterson**
<i>Student Academic and Financial Affairs</i>	Miroslav M. Begovic
<i>Student Regulations</i>	Thomas G. Habetler
<i>Student Computer Ownership</i>	James H. McClellan

* Committee chair
 ** Ex-officio

Distance Learning and Professional Education Conferences and Courses

During 2002-03, both active and retired ECE faculty members offered and taught 18 sections of courses through the Georgia Tech Distance Learning and Professional Education (DLPE) Office. Below is a listing of course dates, titles, and ECE-based instructors and administrators; all classes were taught at Georgia Tech's Atlanta campus, unless indicated otherwise. Seven ECE-sponsored conferences and workshops are also included in this list.

DATE	TITLE	INSTRUCTOR/ADMINISTRATOR
July 2002		
22-26	<i>RF & Wireless Principles and Practice</i>	Robert K. Feeney and David R. Hertling
August 2002		
5-9	<i>CMOS Analog Integrated Circuits</i>	Phillip E. Allen (Milpitas, CA)
September 2002		
4-October 23	<i>Fundamentals of Engineering</i>	W. Russell Callen, Jr.
17-19	<i>Power Distribution System Grounding and Transients</i>	A.P. Sakis Meliopoulos
October 2002		
8-11	<i>CASES 2002</i>	Krishna V. Palem (Grenoble, France)
21-25	<i>Near-field Antenna Measurements and Microwave Holography</i>	Edward B. Joy (Boulder, Colo.)
22-25	<i>Power System Relaying: Theory and Application</i>	Miroslav M. Begovic and A.P. Sakis Meliopoulos
November 2002		
12-14	<i>Modern Energy Management Systems</i>	A.P. Sakis Meliopoulos
December 2002		
1-6	<i>Advanced Heterostructure Materials and Devices Workshop</i>	Joy Laskar (Kohala Coast, Hawaii)
2-6	<i>Far-Field, Anechoic Chamber, Compact, and Near-Field Antenna Measurements</i>	Edward B. Joy
12-13	<i>PSERC/IAB Meeting</i>	A.P. Sakis Meliopoulos
January 2003		
25-March 15	<i>Electrical Engineering Refresher</i>	W. Russell Callen, Jr. and William E. Sayle
27-31	<i>RF and Wireless Engineering</i>	Robert K. Feeney and David R. Hertling
February 2003		
10-April 2	<i>Fundamentals of Engineering</i>	W. Russell Callen, Jr.
March 2003		
10-13	<i>Integrated Grounding System Design and Testing</i>	A.P. Sakis Meliopoulos
24-25	<i>International Workshop on Wafer Level CSP and Flip Chip Packaging</i>	Leyla S. Conrad
26-28	<i>Materials Conference</i>	Leyla S. Conrad
April 2003		
1-4	<i>Power Electronic Devices (Parts A & B)</i>	Ronald G. Harley
23-25	<i>Grounding, Harmonics, and Electromagnetic Influence Design Practices</i>	A.P. Sakis Meliopoulos and George Cokkinides
28-May 2	<i>Antenna Engineering</i>	Edward B. Joy, Waymond R. Scott, Jr., and Glenn S. Smith
May 2003		
5-6	<i>Fault and Disturbance Analysis Conference</i>	A.P. Sakis Meliopoulos
7-9	<i>57th Annual Protective Relaying Conference</i>	A.P. Sakis Meliopoulos
12-16	<i>CMOS Analog Integrated Circuits</i>	Phillip E. Allen
13-16	<i>MEMS Boot Camp</i>	Farrokh Ayazi, Mark G. Allen, and A. Bruno Frazier
13-15	<i>Power System Reliability and Risk Assessment</i>	A.P. Sakis Meliopoulos

academic, research, and administrative

One hundred ninety-one employees holding academic professional titles, research faculty/personnel titles, and administrative staff titles were employed in ECE during 2002-2003. As of June 30, 2003, ECE employed 179 administrative, research, and academic professionals.

ACADEMIC PROFESSIONALS

Jill Auerbach	Academic Professional
Christina Bourgeois	Lecturer
Leyla Sutcu Conrad	Senior Academic Professional
Michael D. Furman	Academic Professional
Warren M. Lanier	Academic Professional
Fran ois J. Malassenet	Directeur of Georgia Tech Lorraine/Acad. Pro.
Christopher McGahey	Academic Professional
Gail O. Palmer	Lecturer
Ashanti Pyrtle	Academic Professional
Kathleen Robichaud	Senior Academic Professional
Miroslav Velev	Instructor
David S. Webb	Senior Academic Professional and Assistant to the Chair for Computer Support

RESEARCH FACULTY/PERSONNEL

Robin Abothu	Postdoctoral Fellow
Caryn Arrowood	Research Engineer II
Junfeng Bai	Postdoctoral Fellow
Adriano Batista	Postdoctoral Fellow
Abdul Beyah	Research Engineer I
Swapan K. Bhattacharya	Senior Research Scientist
Benny Bing	Research Engineer I
John Bordelon	Senior Research Engineer
Stuart Bowden	Research Engineer II
Edgar Brown	Research Engineer I
Giorgio Casinovi	Senior Research Engineer
Sudipto Chakraborty	Research Engineer II
Thomas C. Champion	Research Engineer I
Yi-Jan Chen	Research Engineer II
Larry T. Coffeen	Research Engineer II
George Cokkinides	Visiting Professor
Timothy Collins	Research Technician II
Didier Contis	Research Engineer I
Florent Cros	Research Engineer I
Lorand Csiszar	Research Technologist
Maryann D Alessandro	Postdoctoral Fellow
Sidharth Dalmia	Research Engineer II
Ravi Doraswami	Research Engineer II
Zhe Chuan Feng	Senior Research Scientist
Babak Firoozbakhsh	Research Engineer I
Sergei Goupalov	Postdoctoral Fellow
Mason Graff	Research Scientist I
Daniel Guidotti	Senior Research Scientist
Jeff Hall	Research Engineer I
Ki Ho Han	Postdoctoral Fellow

Zhili Hao	Postdoctoral Fellow
Charles Hardnett	Research Scientist I
Richard A. Hartlein	Senior Research Engineer
Lonnie D. Harvel	Senior Research Scientist
Walter Henderson	Research Scientist I
Deukhyoun Heo	Research Engineer II
Thorsten Hertel	Postdoctoral Fellow
Eliezer Hershkovits	Postdoctoral Fellow
Jeffrey Hildreth	Research Engineer I
Raymond C. Hill	Research Technologist
Raquel Hill	Postdoctoral Fellow
Ajay Jayaraj	Research Engineer I
Jimmie Jones	Research Technician III
Admela Jukan	Visiting Assistant Professor
Sina Khorasani	Postdoctoral Fellow
Kang-Wook Kim	Postdoctoral Fellow
Tong-Ho Kim	Postdoctoral Fellow
Dong Seop Kim	Research Engineer II
Christian Kral	Visiting Assistant Professor
Frank C. Lambert	Senior Research Engineer
Jongsoo Lee	Postdoctoral Fellow
Ronglin Li	Postdoctoral Fellow
Kyutae Lim	Research Engineer II
Ching-Lang Lin	Research Engineer II
Fuhan Liu	Research Engineer I
David Majernik	Research Engineer II
Pulugurtha Markondeya-Raj	Postdoctoral Fellow
Alexey Maslov	Postdoctoral Fellow
Janeen McReynolds	Research Engineer I
Sebastien Nuttinck	Research Engineer I
Thomas J. Parker	Research Technologist II
Shashikant G. Patel	Research Engineer II
Rickard Petersson	Postdoctoral Fellow
Stephane Pinel	Research Engineer II
Mark A. Richards	Principal Research Engineer
Caterina Scoglio	Research Engineer II
Samuel F. Smith	Research Scientist I
W. Whitfield Smith	Senior Research Engineer
Paul L. Springer	Senior Research Engineer
Harry T. Sullivan	Research Scientist I
Venkatesh Sundaram	Research Engineer II
Dean A. Sutter	Electrical Engineer III
Liang Tang	Postdoctoral Fellow
Charles Thomas	Research Technician IV
Tuna Tugcu	Postdoctoral Fellow
Ajay Uphadhyaya	Research Engineer I
Lixi Wan	Research Engineer II
George White	Senior Research Engineer

academic, research, and administrative

Wei Dong Xiang Research Engineer II
Guang Yuan Postdoctoral Fellow
Tiejun Zhang Postdoctoral Fellow
Qing Zhou Postdoctoral Fellow

ADMINISTRATIVE STAFF

Nancy L. Baines Administrative Assistant II
Debra Balkcom Accountant II
Harry Beck Director of Operations
Erick Beebe Systems Support Specialist III
Brian Bennett Mechanical Technician I
Margaret Boehme Administrative Assistant II
Margarita Bolet Administrative Coordinator
Robert C. Boozer Business Operations Manager
Louis Boulanger Mechanical Technician III
Thomas E. Brewer Assistant to the Chair and Laboratory Manager II
Yvonne Bridges Administrative Assistant II
Rebecca Suzy Briggs Director of ECE Development-Alumni
Lynda D. Buescher Assistant Director for ECE Personnel Services
Mary Christine Bullard Accountant III
Valarie Burnette Senior Accounting Assistant
Dale E. Callaway Research Coordinator II
Kathy B. Cheek Program Coordinator II
Sherrie Cooper Academic Assistant I
Sharon Crouch Assistant Director for ECE Accounting
Marion Crowder Senior Information Specialist
Bethany Davis Program Coordinator II
Charlotte A. Doughty Administrative Assistant II
Erica Edwards Accountant II
Angela Elleby Academic Advisor I
Christy K. Ellis Administrative Assistant II
Heather L. Emmert-Cudmore Program Coordinator II
Christopher Evans Project Director II
Kimberly Faggett Program Coordinator I
Barry N. Fairley Research Coordinator I
Cordai Farrar Administrative Assistant II
Claudia Ford Academic Advisor II
Diana L. Fouts Graphics Specialist
Fabienne Gayet-Berge Program Coordinator II
Kayron C. Gilstrap Administrative Manager I
LaJauna F. Guillory Program Manager
Samuel Gunderman Computer Services Specialist II
Pamela F. Halverson Administrative Assistant II
Trina Hamlin Web Author
David W. Harwell Research Coordinator I
Sandra S. Hayes Program Manager
Elaine Hicks Administrative Assistant I
Fanchette Hillery Computer Services Specialist III
Robert R. House Electronics Specialist
Richard L. Howell Research Coordinator I
Leslie Hudson Accountant II
Angela Hughes Administrative Manager I

Marcus Johnson Program Manager
Edgar L. Jones Facility and Laboratory Coordinator
Rajib Joshi-Acharya Computer Services Specialist III
Debra B. Kelley Program Manager
Deborah K. King Administrative Assistant II
Sharon D. Lawrence Academic Assistant II
Angelo Lawton Research Coordinator I
Herbert Lensch Computer Services Specialist II
Kelli Littlefield Program Coordinator I
Judith C. Lorier Accounting Manager I
Ephraim Macharia Administrative Assistant I
Keith May Computer Services Specialist III
Elizabeth McDonald Systems Support Specialist I
W. Bruce McFarland Laboratory Coordinator
Thomas McKoon Research Coordinator II
Rachel Melton Web Developer
Doria Moore Accountant III
Mary Ellen Mount Administrative Coordinator
Marilouise Mycko Program Manager
Janet M. Myrick Administrative Assistant II
Jacqueline L. Nemeth Senior Information Specialist
Linda Newton Administrative Assistant II
Jalisa Norton Program Coordinator II
Boyd M. Pettitt Research Coordinator II
Sharon Pugh Administrative Assistant II
Gail A. Reeves Project Coordinator II
Mary Render Accountant III
Carl A. Rust Business Operations Manager
Gwendolyn J. Satchel Administrative Assistant II
Leslie Schlag Administrative Assistant I
Jason Seletos Program Coordinator II
Purnima Sharma Administrative Assistant II
Fred T. Stanley Research Coordinator I
Florence I. Stoia Program Coordinator II
Brian Strickland Programmer I
Christine Sun Programmer III
Dean C. Sutter Electronics Technician I
Denise D. Taylor Program Coordinator II
Marvin Tingler Head—Supply and Materials
Selina Tinsley Administrative Secretary
Janet Tippens Information Analyst II
Michael Toole Electronics Technician I
Jacqueline Trappier Administrative Supervisor II
Alvis Turner Assistant to the Director for NEETRAC Operations
Judith Vanderboom Administrative Manager I
Harry L. Vann Director of ECE Development-Corporate Relations
Darryl Warsham Accountant III
Todd E. Whitehurst Computer Services Specialist IV
Dean Williams Research Coordinator II
Rochelle Y. Williams Accountant III
Suzette Willingham Program Coordinator I
Carla Zachery Accountant III

students

The official ECE student enrollment hit the 2,900 mark, continuing its upward climb of the last five years, according to Georgia Tech's Office of Institutional Research and Planning (IRP). This total represents all full-time and part-time undergraduate and graduate students, including those students enrolled at the Georgia Tech Regional Engineering Program, as of mid-October 2002.

According to ECE Academic Office records, the average entering freshman had a high school grade point average (GPA) of 3.76, a SAT verbal score of 633, and a SAT math score of 708. The average entering undergraduate transfer student had a high school GPA of 3.42, a previous college GPA of 3.48, a SAT verbal score of 527, and a SAT math score of 624. The average entering graduate student had an undergraduate GPA of 3.58, a GRE analytical score of 684, a GRE quantitative score of 763, and a GRE verbal score of 510.

Both electrical engineering and computer engineering continue to be among the most popular courses of study with Georgia Tech undergraduates. While computer engineering continues to be the major of choice for entering freshman students, electrical engineering is the major preferred by transfer students.

The graduate program jumped from a total enrollment of 899 during academic year 2001-02 to 1,006 this fall. This larger than expected enrollment arose from several factors, but especially due to the soft job market, the School's national rankings in various publications such as *U.S. News and World Report*, and the program's reputation for producing outstanding engineers that are eagerly sought by top international companies and universities.

The tables below detail enrollments and graduation totals for each of the School's academic programs, including percentages of female involvement and ethnic group representation.

STUDENT PROFILE (Based on Fall 2002 Enrollment)								DEGREES AWARDED (Summer 2002-Spring 2003)								
	Total	Asian	Black	Multi-Hispanic	White	Racial	Female		Total	Asian	Black	Hispanic	White	Multi-Racial	American Indian/Alaskan Native	Female*
BSEE	955							BSEE	248	67	39	6	130	6	0	33
BSCmpE	903							BSCmpE	143	44	10	3	84	2	0	10
BSCmpE/GTREP	36							BSCmpE/GTREP	12	0	2	0	10	0	0	1
Total	1,894	30.1%	11.4%	3.4%	53.6%	1.5%	11.1%	Total	403	27.5%	12.7%	2.2%	55.6%	2.0%	0%	10.9%
MS/MSECE	420							MS	97	62	3	0	27	1	0	15
Special	7							MSECE	197	34	13	1	143	1	1	17
PhD	579							PhD	49	27	0	0	21	0	0	4
Total	1,006	44.7%	6.7%	3.0%	45.3%	.3%	13.1%	Total	343	35.9%	4.7%	1.2%	55.7%	1.3%	1.2%	10.5%
Grand Total	2,900							Grand Total	746							

* Female enrollment percentages derived from total number of women in each ethnic group.

STUDENT HONORS AND AWARDS

Olufeyijimi Awofadeju received the Dorothy Cowser Yancy Incentive Award, given to an African-American Georgia Tech freshman with the most outstanding academic record based on GPA, level of curriculum difficulty, and participation in activities related to the student's program of study.

Shilo Ayalon and **Daniel Dyke** received ECE Outstanding Achievement Awards from the School's Student-Faculty Committee in recognition of their outstanding performances in the classroom and in university activities.

Tariq Bakir, Aliakbar Jafarpour, Koon Yin Kong, Elliot Moore, Mary Nsunwara, Somboon Nuchprayoon, Branislav Radibratovic, Matthew Rehberg, Rawin Rojvanit, Gail Rosen, Bruce Sheplan, Rick Tarbell, Nadine Taylor, Keith Voss, and Rajbabu Velmurugan each received an Outstanding ECE Graduate Teaching Assistant Award.

Sabri Basat, David Nicol, and Alex Talpasanu received Undergraduate Research Opportunity Program Best Paper Awards this spring from the ECE Student-Faculty Committee. Mr. Nicol received first place for his paper, Development of a Circadian Light Source. Mr. Basat received second place for his paper, Design of

RF and Wireless Packages Using Fast Hybrid Electromagnetic/Statistical Methods. Mr. Talpasanu received third place for his paper, Computer Educational Datapath (CED): Basic Computer Design for K-12 Education.

Ismail Baskaya, Zesheng Chen, Gavin Ho, Guanglei Liu, and Ramanan Bairavasubramanian each received the Colonel Oscar P. Cleaver Award for receiving the highest scores on the doctoral preliminary examination.

Aziz Umit Batur received the ECE Graduate Research Assistant Excellence Award for his outstanding research productivity, helping to ensure that ECE remains a leader in the research community.

Brian Patrick Boyd was chosen for the Briaerean Scholarship Cup for having the highest GPA among all senior-level, Georgia Tech co-op students. Mr. Boyd also received the Most Outstanding ECE Senior Co-op Award; he was chosen from a set of nominees considered by their co-op employers to be the most outstanding co-op employees in their companies.

Brian Patrick Boyd, Alaa Amin Kharbouch, Shahriar Rohinton Khushrushahi, and Wing Sze Mona Wong each received the ECE Senior Scholar Award for having the highest GPAs in their class.

Brian Patrick Boyd and **Wing Sze Mona Wong** received the International Engineering Consortium/William L. Everitt Student Awards of Excellence for their outstanding academic records.

Jonathan Scott Cudnik and **James Robert Massey** received James G. and Mary G. Wohlford Scholarships, which recognize outstanding senior co-op students who have excelled both in academics and on the job.

Tim Cooper received the Outstanding Service to Georgia's Community Award for his role in coordinating and organizing the First LEGO League Pilot Robotic Competition, which involved 16 teams of Georgia school children, aged 9 to 14.

Nathan Greer, Olivier Guerreau, Kay Hill, Jean-Marc Merolla, Jeremy Silver, and **Catherine Thorn** received the Georgia Engineering Foundation Senior Design Award for the most outstanding senior design project in the College of Engineering.

Nickolas Kingsley received a President's Undergraduate Research Award from the office of Georgia Tech President Wayne Clough. Mr. Kingsley's area of research is novel microwave circuits on CMOS grade Si substrates for a wireless chip-to-chip interconnect system; he is advised by **Ioannis (John) Papapolymerou**.

Justin Kloos, Vikram Raj, and **Steve Sanders** each received a Henry Ford II Scholar Award for having the best academic records in the College of Engineering at the end of the third year of undergraduate study.

Erdem Matoglu received the Outstanding Paper Award for his paper entitled Efficient Statistical Analysis and Diagnosis of High Speed Source Synchronous Interfaces at the IEEE Conference on Electrical Performance of Electronic Packaging, which was held in Monterey, Calif. in October 2002. The award was sponsored by Intel Corporation, and his faculty advisor is **Madhavan Swaminathan**.

Mile Milisavljevic received the 2002 Sigma Xi Ph.D. Thesis Award. His advisor was **Erik I. Verriest**.

Lucas Milner received the ECE Junior Scholar Award for having the highest GPA in his class.

Eric J. Orrington received the AESO Systems Graduate Minority Engineering Award, in cooperation with the Georgia Tech chapter of the National Society of Black Engineers. This award recognizes an outstanding graduating minority senior who has been admitted to graduate school in engineering.

John Parsons received the Hoyt Coffee Memorial Award for Writing, which is presented to an outstanding writer for *The Technique*, Georgia Tech's student-run newspaper.

Ryan Jesse Pirkl received the Outstanding ECE Sophomore Award for having the highest scholastic average in his class.

David Richard Reid received the Outstanding ECE Senior Award for attaining a very high scholastic average and for his active role in Georgia Tech and ECE extracurricular activities.

William Robinson was awarded a Ford Fellowship; this honor is awarded to 130 outstanding scholars across the U.S. who are underrepresented minorities. Mr. Robinson is advised by **D. Scott Wills**.

Weilian Su and **Yogesh Sankarasubramaniam** received the IEEE Communications Society Best Tutorial Paper Award for the paper A Survey on Sensor Networks, published in the August 2000 issue of the *IEEE Communications Magazine*. The award was presented at the International Conference on Communications, held in Anchorage, Alaska, in May 2003. Their advisor is **Ian F. Akyildiz**.

Darryl Julian Ward received the Georgia Tech Society of Black Engineers Faculty Advisor Award for his outstanding scholarship and leadership qualities.

Adam Wathen received the ECE Teaching Assistant Excellence Award for his outstanding work in support of the ECE instructional program.

Chris Wieczorek received the Faculty Award, School of ECE for being the student who, in the opinion of the ECE faculty, has done the most to improve the educational environment within the School or the Institute and who has contributed significantly to both student welfare and student-faculty interactions.

Ning Wu received the ECE Undergraduate Research Award for demonstrating an unusually strong aptitude for research.

Ph.D. Students Graduated

Forty-nine students graduated with their doctoral degrees in 2002-03. The students are listed in this section, along with their advisors, graduation dates, thesis titles, and current places of employment.

Summer 2002

Sung Pil Chang	M. Allen	<i>Robust Micromachined Capacitive Pressure Sensors for Mechanically Harsh Environments</i>	Senior engineer, Optics and MEMS Lab; Samsung Electro-Mechanic, Suwon, South Korea.
Mahmut Ciftci	Williams	<i>Channel Equalization for Chaotic Communications Systems</i>	Application engineer; Texas Instruments, Inc., Stafford, Tex.
Joseph Hobbs	Tummala	<i>Integration of Thin Film Polymer Ceramic Nanocomposite Capacitor Dielectrics in System-on-Package for Decoupling Applications in High Speed Digital Communications</i>	Advanced Engineering Division; DELPHI, Warren, Ohio.
Jeng-Jung Shen	Brown	<i>Heterogeneous Integration and the Exploitation of Strain in MBE Growth Engineered Substrates</i>	Not known.
Mark Smith	Peterson	<i>Electromagnetic Scattering from Three-Dimensional Penetrable Structures Computed with Combined Field Integral Equations on Dual Interlocking Meshes</i>	Principal consultant; Signal Scientific LLC, Alpharetta, Ga.
Vasos Vassiliou	Owen	<i>An Integration Framework and a Signaling Protocol for MPLS/Diffserv/HMIP Radio Access Networks</i>	Assistant professor, Department of Computer Science; Inter-College, Nicosia, Cyprus.
Changhyun Yi	Brown	<i>InP-based Heterojunction Bipolar Transistors for High Speed and RF Power Applications: Advanced Emitter-base Designs</i>	Research engineer II, School of Electrical and Computer Engineering; Georgia Institute of Technology, Atlanta, Ga.

Fall 2002

Cenk Argon	McLaughlin	<i>Turbo Product Codes for Optical Communications and Data Storage</i>	Senior engineer, Advanced Signal Processing Group; Seagate Technology, Bloomington, Minn.
Sudipto Chakraborty	Laskar	<i>Development of Silicon-based Direct Conversion Receiver</i>	Postdoctoral fellow, School of Electrical and Computer Engineering; Georgia Institute of Technology, Atlanta, Ga.
Sungrae Cho	Akyildiz	<i>Resource Allocation and Error Control Protocols for Real-time Communications in Satellite Networks</i>	Samsung in Seoul, South Korea.
Jinseong Choi	Swaminathan	<i>Modeling of Power Supply Noise in Large Chips Using the Finite Difference Time Domain Method</i>	Senior packaging engineer; Advanced Micro Devices, Sunnyvale, Calif.
Sidharth Dalmia	Swaminathan	<i>Design and Implementation of High-Q Passives for Wireless Applications Using System-on-Package-based Organic Technologies</i>	Research engineer, School of Electrical and Computer Engineering; Georgia Institute of Technology, Atlanta, Ga.
Zhiwei Dong	P. Allen	<i>Low-power, Low-distortion Constant Transconductance Gm-C Filters</i>	Design engineer; Silicon Laboratories, Austin, Tex.
Hong Huang	Copeland	<i>Hybrid and Resilient WDM Mesh Optical Networks</i>	Assistant professor, Klipsch School of Electrical and Computer Engineering; New Mexico State University, Las Cruces, N.M.
Neena Imam	Gaylord	<i>Analysis, Design, and Testing of Semiconductor Intersubband Devices</i>	Research fellow; Oak Ridge National Laboratories, Oak Ridge, Tenn.
Michele Jamzorik	Hayes	<i>Spatio-temporal Segmentation in the Compressed Domain</i>	Instructor; Georgia Tech Lorraine, Metz, France.
Ji-Weon Jeong	Rohatgi	<i>Hydrogen-Passivation of Defects and Rapid Thermal Processing for High-efficiency Silicon Ribbon Solar Cells</i>	Research scientist; LG Chemical, Ltd., Daejun, South Korea.

Sangbeom Kang	Brown	<i>The Epitaxial Growth of GaN and AlGaIn/GaN Heterostructure Field Effect Transistors on Lithium Gallate (LiGaO₂) Substrates</i>	Not known.
Daeyoung Kim	Ingram	<i>Propagation Measurements and System Design for Long-range RF Tags</i>	Senior engineer; Samsung Electronics, Gyeonggi-do, South Korea.
Joong-Ho Kim	Swaminathan	<i>Modeling of Power Distribution Networks Using Transmission Matrix and Macro-modeling Methods</i>	Senior design engineer; Intel, Chandler, Ariz.
Wiehan Le Roux	Harley	<i>On-line Detection of Rotor Faults in Permanent Magnet Machines Using Only Terminal Quantities</i>	Engineer-in-training; Spoornet, Johannesburg, South Africa.
Seungkoo Lee	Vachtsevanos	<i>An Architecture for a Diagnostic/Prognostic System with Rough Set Feature Selection and Diagnostic Decision Fusion Capabilities</i>	Electrical research engineer; Williams-Pyro, Inc., Fort Worth, Tex.
Song Li	Taylor	<i>Numerical Methods for Stable Inversion of Nonlinear Systems</i>	Director of Operations of Engineering; Ciena Corporation, Linthicum, Md.
Ye-Ming Li	Connelly	<i>A Design Methodology for Low Phase Noise in LC Tuned CMOS Voltage-controlled Oscillators</i>	Mixed-signal design engineer, Integrated Electronics and Sensors Lab; GE Global Research Center, Niskayuna, N.Y.
Borka Milosevic	Begovic	<i>On Voltage Stability Monitoring and Control Using Multiagent Systems</i>	Engineer II; Southern Company Services, Atlanta, Ga.
Rickard Petersson	G. Smith	<i>Analysis of Two Problems Related to a Focused Beam Measurement System</i>	Postdoctoral fellow, School of Electrical and Computer Engineering; Georgia Institute of Technology, Atlanta, Ga.
Samuel Sander	L. Wills	<i>Retargeting Data-parallel Image-processing Algorithms for Focal-plane SIMD Architectures</i>	Senior professional staff; Johns Hopkins University Applied Physics Laboratory, Laurel, Md.
Gregory Slabaugh	Schafer	<i>Novel Volumetric Scene Reconstruction Methods for New View Synthesis</i>	Technical staff member; Siemens Corporate Research, Inc., Princeton, N.J.
Jason Stack	Habetler	<i>Fault Signature Detection for Rolling Element Bearings in Electric Machines</i>	Research engineer; U.S. Navy, Coastal Systems Station, Panama City, Fla.
Pornchai Supnithi	McLaughlin	<i>Coding and Signal Processing in M-ary Optical Recording Systems</i>	Faculty of engineering; King Mongkut s Institute of Technology, Bangkok, Thailand.
Tarek Taha	S. Wills	<i>A Parallelism, Instruction Throughput, and Cycle Time Model of Computer Architectures</i>	Assistant professor, Department of Electrical and Computer Engineering; Clemson University, Clemson, S.C.
Mustafa Turkboylari	Madisetti	<i>Handoff Algorithms: Analysis and Improvements</i>	ADSL Modem Software Engineer; Texas Instruments, Inc., Dallas, Tex.
Craig Ulmer	Yalamanchili	<i>Extensible Message Layers for Resource-rich Cluster Computers</i>	Senior member of technical staff, Visualization and Data Services Group; Sandia National Labs, Livermore, Calif.
Tsung-Hsing Yu	Brennan	<i>Numerical Studies of Heterojunction Transport and High Electron Mobility Transistor Devices</i>	Not known.

Spring 2003

Mohamed Abou El-Nasr	Wardi	<i>Optimal Control of Manufacturing Systems: An Optimal Control Perspective</i>	Assistant professor; Arab University of Alexandria, Alexandria, Egypt.
Abdallah Al-Ahmari	Barry	<i>Turbo-coded Pulse-position Modulation for Optical Communications</i>	Assistant professor; King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia.
Leandro Barajas	Egerstedt	<i>Process Control in High-noise Environments Using a Limited Number of Measurements</i>	Senior research engineer, Manufacturing Systems Research Lab; General Motors in Warren, Mich.

students

Theocharis Boukas	Habetler	<i>Exact Feedback Linearization with State Derivative Feedback for High-performance Field-oriented Induction Motor Speed/Position Control</i>	Applications engineer; Framatome ANP, Alpharetta, Ga.
Qiang Chen	Meindl	<i>Scaling Limits and Opportunities of Double-Gate MOSFETs</i>	Postdoctoral fellow, School of Electrical and Computer Engineering; Georgia Institute of Technology, Atlanta, Ga.
Nathan Scott Clements	Vachtsevanos	<i>Fault Tolerant Control of Complex Dynamical Systems</i>	Senior systems engineer; Lockheed-Martin, Fort Worth, Tex.
Muhammed Coban	Mersereau	<i>Region-based Subband Coding of Image Sequences</i>	Technical staff; Packet Video Corporation, San Diego, Calif.
Yu-Kung Ke	Copeland	<i>Scalable Mechanisms for IP OS-based Routing with Performance Objective</i>	Seeking employment.
Kang-Wook Kim	Scott	<i>Numerical and Experimental Investigation of Impulse-radiating Antennas for Use in Sensing Applications</i>	Postdoctoral fellow, School of Electrical and Computer Engineering; Georgia Institute of Technology, Atlanta, Ga.
Mustafa Koroglu	P. Allen	<i>High Frequency Integrated Filters for Wireless Applications</i>	Electronic design engineer; Conexant Systems, Newport Beach, Calif.
Siddharth Manay	Yezzi	<i>Applications of Anti-geometric Diffusion to Computer Vision Thresholding, Segmentation, and Distance Functions</i>	Postdoctoral fellow, Department of Computer Science; University of California at Los Angeles, Los Angeles, Calif.
Somboon Nuchprayoon	Begovic	<i>On Power Scheduling and Strategic Behavior in Electricity Markets</i>	Lecturer, Department of Electrical and Computer Engineering; Chiang Mai University, Chiang Mai, Thailand.
Jaudelice Oliveira	Akyildiz	<i>New Techniques for End-to-End Quality of Service Provisioning in DiffServ/MPLS Networks</i>	Assistant professor, Department of Electrical and Computer Engineering; Drexel University, Philadelphia, Pa.
Wichit Saiklao	Copeland	<i>Adaptive Bandwidth Allocation for Virtual Path in Broadband Networks</i>	Director of Business Development; xSense Information Service Company, Ltd., Pakkret Nontha-Buri, Thailand.
Raguraman Venkatesan	Meindl	<i>Multilevel Interconnect Architectures for Gigascale Integration</i>	Senior CAD engineer; Intel Corporation, Hillsboro, Ore.

Student Organizations

The lifeblood of ECE is its students. The IEEE student branch, Eta Kappa Nu, and the ECE Student Advisory Council play very important roles by providing students with opportunities for personal and professional development. These groups also provide valuable input to the School's faculty and administrators regarding student issues and concerns.

Eta Kappa Nu (HKN) is the international honor society for electrical engineers; outstanding juniors, seniors, and graduate students are eligible to be elected to this program. HKN sponsors the annual ECE Spring Picnic and several awards that are given to faculty and students throughout the year.

To give students a further voice in the School's affairs, the ECE Student Advisory Council meets with ECE administrators and the ECE Advisory Board on a regular basis.

2002-03 Eta Kappa Nu Officers

Matt Wiggins	President
Alan Ngo	Vice President
Nirav Patel	Treasurer
Tiffany Glover	Recording Secretary
Daniel Markoff	Corresponding Secretary
Jordan Lusterman	Bridge Correspondent
Woosuk Choi	Graduate Liaison
Thomas K. Gaylord	Faculty Advisor

2002-03 ECE Student Advisory Council

Christopher Alvino	Miguel Lopez
Allison Laurel Amis	Jordan Lusterman
Shannon Brenner	Daniel Markoff
Shuodan Donna Chen	Elliot Moore
Sean Cherry	Alan Ngo
Woosuk Choi	Saunvit Pandya
Irene Dershin Chow	Reshma Vikram Parekh
Eric Clopper	Nirav Patel
Daniel Collins	Darius Person
Douglas DesCamps	Steven J. Romej
Siddharth (Sid) Easwar	Anthony E. Seto
Adam Eisenman	Jeet Shah
David Ewing	Arjun Nitin Warty
Suzanne Fike	Elizabeth A. Whitaker
Tiffany Glover	Christopher Wiczorek
Kenneth Grove	Matt Wiggins
Todd Hoffenberg	

IEEE

During 2002-03, the IEEE named the Georgia Tech student branch of IEEE as the largest in the entire world. The IEEE student members host seminar speakers from various companies and organizations on a weekly basis, and they sponsor a Student/Professional Awareness Conference each spring. They also participate in numerous competitions and conferences on the national and international levels. In March 2003, the IEEE hosted a special visit and presentation by Winifred Latimer Norman, the granddaughter of Lewis Latimer, a contemporary of both Alexander Graham Bell and Thomas Alva Edison. She shared Mr. Latimer's contributions to the birth of the electrical engineering field in her presentation, *From the Plantation to the Patent Office*, which detailed her grandfather's life. A child of runaway slaves, Mr. Latimer reached the pinnacle of his career when he was named as one of the 28 charter members of the Edison Pioneers in 1918. Dr. Norman is an internationally known church leader, social worker, and public speaker who has dedicated an enormous amount of energy to preserving the history of her grandfather's technical contributions and to save and preserve the Latimer family home in Queens, N.Y. For the past six years, John Matthews, an adjunct professor in ECE and IEEE student branch advisor, has welcomed Dr. Norman's participation in teleconferences with his illumination engineering classes, sharing her grandfather's accomplishments.

2002-03 IEEE Student Branch Officers and Chairs

Chris Wiczorek	Chair
Mike Roberts	Vice Chair, Internal Relations
Sriram Narasimhan	Vice Chair, External Relations
Mario Vites	Treasurer
Irene Chow	Secretary
Kyle Howell	Hardware Chair
James Moes	Mailing Lists Manager
Mashruba Tasneem	Publicity Chair
Saunvit Pandya	Social Chair
Peter Sahlstrom	Webmaster
John H. Matthews	Faculty Advisor

UNDERGRADUATE INSTRUCTION

The Undergraduate Affairs Office schedules and coordinates electrical and computer engineering courses for the main Georgia Tech campus; the Georgia Tech Regional Engineering Program (GTREP) and its partner schools, Georgia Southern University, Armstrong Atlantic State University, and Savannah State University; and Georgia Tech Lorraine.

During 2002-03, ECE undergraduate enrollment totaled almost 1,900 students on the Atlanta campus, with the electrical engineering enrollment slightly higher than that of computer engineering. GTREP produced 12 computer engineering graduates during this past academic year.

The computer engineering and electrical engineering programs were evaluated by the Engineering Accreditation Commission (EAC) of ABET in fall 2002, and the computer engineering program at GTREP had its initial evaluation for accreditation. The Institute will be reviewed by the Southern Association of Colleges and Schools in 2003. The Georgia Tech EAC/ABET evaluation was one of the first re-visits conducted under the EC 2000 criteria.

During 2002-03, William E. Sayle and Joseph L.A. Hughes served as associate chair for ECE Undergraduate Affairs and associate chair for Computer Engineering and ECE Program Development, respectively.

Associate Chair Emeritus Thomas M. White, who has worked part-time in the ECE Academic Office since his retirement in 1988, decided to retire permanently in 2003. After 33 years of distinguished service to ECE and Georgia Tech, Dr. Sayle retired in August 2003, but will assist the transition of the undergraduate affairs program to Douglas B. Williams, who was named as his successor. Dr. Williams will continue as GTREP coordinator. Joseph L.A. Hughes, whose title will change to associate chair for ECE Academic Operations, will continue to handle faculty workload, course scheduling, and oversight of assessment and accreditation activities.

GRADUATE INSTRUCTION

The ECE Graduate Affairs Office continued its quest to deliver its services more efficiently and effectively, as it processed thousands of pre-applications and actual applications to the ECE program.

David R. Hertling, ECE associate chair for Graduate Affairs, and his staff are responsible for graduate curriculum matters, student recruiting and advising, and admission. After the retirement of Dr. Sayle, Dr. Hertling will also manage the graduate teaching assistant assignment process. They also work in tandem with the ECE Graduate Committee and the ECE Graduate Student Recruitment Committee to enact sound academic policies and to attract high quality master's and doctoral students to the program.

INTERNATIONAL STUDIES

Georgia Tech Lorraine

A non-profit corporation located in Metz, France and operated under French law, Georgia Tech Lorraine (GTL) has four areas of emphasis—graduate education, sponsored research, undergraduate summer

education, and continuing education. GTL offers undesignated master's degrees, master's degrees in either electrical and computer engineering or mechanical engineering, and Ph.D. degrees in both disciplines. Total fall 2002 enrollment was 240.

Cooperative agreements with local partner institutions enable students to pursue double degree programs in engineering and sciences, in addition to degrees from Georgia Tech. Upon successful completion of these highly innovative and integrated programs, students are awarded master's degrees from Georgia Tech and graduate diplomas from a partner institution. The *Bin me* Program, a double-degree graduate program and an industry-university partnership between the U.S. and France, allows two-member, Franco-American student teams to immerse themselves in the other country's culture through an industrial internship and academic study. The sponsoring company places the American student on work assignment in France, and then the same company places a French student to work at one of its locations in the U.S. For the American student, the program begins with two consecutive semesters of study at GTL and then the student spends three months working for a French company. The program then concludes with a final semester of study at one of the partner institutions. The French half of the *Bin me* Program begins with a semester of study at one of the partner institutions, followed by a semester at GTL. The French student then travels to the U.S. to complete the program with a three-month internship and a final semester of study at the Georgia Tech-Atlanta campus. In December 2002, GTL was honored with the International Initiatives Award for the *Bin me* Program at the *Trophées de Grandes Ecoles d'Ingenieurs* Awards Ceremony, held in Paris, France, in December 2002.

GTL also offers a 10-week-long, undergraduate summer program that includes courses in architecture; electrical engineering; computer engineering; economics; French; industrial and systems engineering; history, technology, and society; mechanical engineering; and management.

Hans B. Püttgen and François J. Malassenet serve as GTL's president and directeur, respectively.

Oxford Study Abroad/Pacific Study Abroad

The Oxford Study Abroad Program and Pacific Study Abroad Program are two unique academic and cultural experiences. Arthur Koblasz serves as Oxford's program director.

Taking place during the spring semester, the Pacific Study Abroad Program allows students to take courses in biology, engineering, management, humanities, and social sciences.

The program has ties to multiple institutions of higher learning. Courses are taught at universities located in Australia, New Zealand, and Japan. The 2002-03 Australia program had an enrollment of 85.

Coursework for the Oxford Study Abroad Program is taught primarily at Oxford University during the summer semester, and students are also able to earn credit by taking part in one of several travel courses offered in continental Europe. The program offers classes in engineering, architecture, management, music, social sciences, and the humanities. Students earn six credits while traveling throughout continental Europe and six credits while at Worcester College, one of the colleges of Oxford University. The 2002-03 Oxford program had an enrollment of 126 students.

The College of Engineering (CoE) held its annual alumni awards induction ceremony on November 1, 2002 at the Grand-Hyatt Atlanta. Thirteen ECE alumni were inducted into distinct groups of honor—the CoE Hall of Fame, the CoE Academy of Distinguished Engineering Alumni, and the CoE Council of Outstanding Young Engineering Alumni.

College of Engineering Hall of Fame

Membership in the College of Engineering Hall of Fame is reserved for individuals who have made sustained and meritorious engineering and/or managerial contributions during their careers. Of a total of 12 inductees, three were ECE alumni.

Clayton H. Griffin

BEE 45, MSEE 50
 Manager, System Protection and Control
 (Retired)
 Georgia Power Company
 Atlanta, Ga.

Shirley C. Mewborn

BEE 56
 Vice President (Retired)
 Southern Engineering Company
 Marietta, Ga.

Claude A. Petty, Jr.

BEE 50
 Senior Partner
 PC Associates
 Atlanta, Ga.

Academy of Distinguished Engineering Alumni

The College awards membership in the Academy of Distinguished Engineering Alumni to persons whose contributions to Georgia Tech, the engineering profession and field, and/or society have brought distinction to themselves and to the Institute. Of 24 total inductees, six were ECE alumni.

Michael J. Buckler

BEE 71, MSEE 71
 Vice President, Intelligent Networks
 Lucent Technologies-Bell Laboratories
 Cary, N.C.

John H. Davis

BEE 62
 Founder and Principal
 Technology Advisors Group
 Rumson, N.J.

Michael R. McQuade

PhDEE 80
 Senior Research Associate
 E.I. duPont de Nemours and Company, Inc.
 Wilmington, Del.

Joseph R. Bynum

BEE 69, MSNE 71
 Executive Vice President, Fossil Power Group
 Tennessee Valley Authority
 Chattanooga, Tenn.

Lynn C. Maddox

BEE 64
 Senior Vice President and Principal
 Stein Roe Investment Counsel, LLC
 Chicago, Ill.

Joey L. Trantham

BEE 72, MSEE 73
 Cardiac Electrophysiologist and Interventional
 Cardiologist
 Cardiology Associates
 Panama City, Fla.

Council of Outstanding Young Engineering Alumni

Membership in the Council of Outstanding Young Engineering Alumni is bestowed upon alumni under 40 years of age who have demonstrated outstanding professional achievements. Of a total of 16 inductees, four were ECE alumni.

Bill Blackstock

BEE 86
 Business Manager
 Milliken and Company
 LaGrange, Ga.

H. Alan Mantooth

PhDEE 90
 Professor, Department of Electrical Engineering
 University of Arkansas
 Fayetteville, Ark.

W. Scott Potter

BEE 84
 Senior Engineering Manager
 Digital Technology and Network Systems
 Government Communication Systems Division
 Harris Corporation
 Palm Bay, Fla.

Kelvin C. Hawkins

MSEE 92
 Manager, eServer Xseries Server Group
 IBM
 Durham, N.C.

Georgia Tech Foundation Grants and Gifts

During FY 2003, corporate and individual donors contributed \$3,715,004 to ECE through the Georgia Tech Foundation. The table to the right shows the amount of funds designated for specific categories. Below is an alphabetical list of the various companies, constituencies, and individuals that donated funds to ECE.

COMPANIES

ADTRAN, Inc.
 Advanced Micro Devices, Inc.
 Analog Devices, Inc.
 Agilent Technologies, Inc.
 AirGas South
 Alcatel USA, Inc.
 Boeing Company
 Cermet, Inc.
 Cisco Systems, Inc.
 Cree Microwave, Inc.
 Cypress Semiconductor Corporation
 EG Technology, Inc.
 EMS Technologies, Inc.
 Exxon Mobil Corporation
 Georgia Power Company
 Gothic Builders, Ltd.
 Harima Chemicals
 Hewlett-Packard Company
 Hitachi, Ltd.
 IBM Corporation
 Integrated Device Technology, Inc.
 Intel Corporation
 Intersil, Inc.
 Kimberly-Clark Corporation
 King III Solutions, Inc.
 Lake Norman Security Systems
 Lincoln Electric Company
 Lucent Technologies
 Matsushita Telecommunications Company
 MicroCoating Technologies
 MilliSensor System and Actuators
 Motorola, Inc.
 National Semiconductor Corporation
 Netherlands-America Community Trust
 Ossid Corporation
 Panasonic Technologies Company
 Raytheon Company
 RF Micro Devices
 Schlumberger, Ltd.
 Siemens AG
 Texas Instruments, Inc.
 The Southern Company

FOUNDATIONS/NON-PROFIT ORGANIZATIONS

Community Foundation for Greater Atlanta
 Community Foundation Silicon Valley
 Duke Energy Corporation Foundation
 Ford Motor Company Fund
 GenCorp Foundation
 Harris Foundation
 Procter and Gamble Fund
 Schlumberger Foundation, Inc.
 The John and Mary Franklin Foundation, Inc.
 The Rutt Bridges Family Foundation

PROFESSIONAL, RESEARCH, AND ACADEMIC ORGANIZATIONS

American Society for Engineering Education
 Georgia Tech Alumni Association
 National Storage Industry Consortium
 Promerus LLC
 Purdue University
 SRC Education Alliance
 Trexco, LLC

INDIVIDUALS

Warren Leighton Batts
 Harry L. Beck
 Suzy Briggs
 Robert J. Butera, Jr.
 William A. Coley
 J. Alvin Connelly
 Sharon A. Crouch
 Thomas A. Edwards
 William M. Flegal
 Thomas K. Gaylord
 Benjamin D. Haeffe

GIFTS

GIFT CATEGORY

Awards	\$21,208
Endowment	\$55,440
Equipment	\$1,872,583
Faculty Support	\$1,005,444
Fellowships	\$168,894
General Support	\$49,975
Memberships	\$355,000
Scholarships	\$58,030
Student Support	\$128,470
Grand Total	\$3,715,004

W. Timothy Holman
 Catherine A. Inabnit
 Herbert S. Lehman
 Judith Lorier
 Kenneth E. Mackenzie
 Joseph E. Mayes, Jr.
 Henry E. Meadows, Jr.
 Jennifer S. Michaels
 Farrokh Mistree
 Wayne Edwin Moore
 Elsie E. Paris
 John B. Peatman
 Andrew F. Peterson
 Hans B. P. ttgen
 Thomas J. Quigley
 Mark A. Richards
 Marvin O. Richter
 William E. Sayle
 William T. Shelton
 Karen D. Troyer
 Kristin S. Turgeon
 Harry L. Vann
 Roger P. Webb
 The Honorable Daniel A. Webster
 Donald S. Wills
 Monroe John Wilner
 Sudhakar Yalamanchili

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 mostly alumni industry representatives, provides this external assessment during its formal, biannual meetings and throughout the year.

Leonard J. Haynes (BEE '72) joined the School's Advisory Board in spring 2003. He is currently the executive vice president and chief marketing officer for The Southern Company, headquartered in Atlanta, Ga. Mr. Haynes joined The Southern Company in 1977 and has previously held executive and management positions in marketing and power delivery at both Georgia Power and The Southern Company.

The 2002-03 advisory board members and their company affiliations are listed below.

Rodney Adkins

IBM
Somers, N.Y.

C. Dean Alford

Chair, ECE Advisory Board
Allied Utility Network
Conyers, Ga.

Antonio R. Alvarez

Cypress Semiconductor
San Jose, Calif.

Michael B. Bartlett

Texas Instruments, Inc.
Dallas, Tex.

Hal Calhoun

Menlo Ventures
Menlo Park, Calif.

Steve W. Chaddick

CIENA Corporation
Alpharetta, Ga.

Michael A. Coleman

Winter Garden, Fla.

H. Allen Ecker

Scientific-Atlanta, Inc.
Lawrenceville, Ga.

Leonard J. Haynes

The Southern Company
Atlanta, Ga.

Scott Madigan

IAMBA Technologies, Inc.
Alpharetta, Ga.

Jim Maran

Consultant
Lawrenceville, Ga.

Michael R. McQuade

DuPont Company
Wilmington, Del.

Shirley C. Mewborn (Deceased)

Marietta, Ga.

Joe Neel

ON Semiconductor
Phoenix, Ariz.

E. Jock Ochiltree

Capital Valley Ventures
El Dorado Hills, Calif.

Randall E. Poliner

Antares Capital Corporation
Melbourne, Fla.

John W. Pope (Deceased)

Southern Company Services
Birmingham, Ala.

Thomas J. Quigley

Broadcom Corporation
Franklin, N.C.

C. Meade Sutterfield

SSPCS Corporation
Atlanta, Ga.

In Memoriam

Shirley C. Mewborn (BEE '56), one of Georgia Tech's first two women graduates and a true role model for female engineers, died after a battle with colon cancer in July 2003. In 2000, Ms. Mewborn retired as vice president and treasurer of Southern Engineering after a 41-year career. In addition to her service on the ECE Advisory Board, Ms. Mewborn had been a member of the Georgia Tech Foundation Board since 1989, as well as chair of the Georgia Tech Research Corporation and the Georgia Tech Advisory Board. She served as president of the Georgia Tech Alumni Association, a member of the Georgia Tech Foundation board, and chair of both the Georgia Tech Research Corporation and the Georgia Tech Advisory Board.

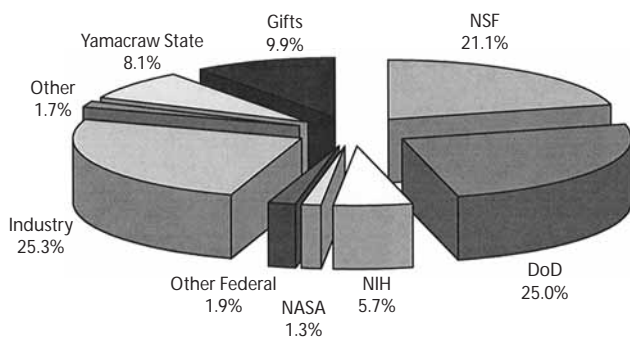
John W. Pope (BEE '69, MSEE '70), an ECE Advisory Board member since 1991, died after a two-and-a-half-year battle with multiple myeloma. He was the director of Bulk Power Services for The Southern Company, based out of Birmingham, Ala. Prior to that, he held other management positions at The Southern Company and Georgia Power. Mr. Pope was active in strengthening the relationships among ECE, Georgia Tech, and The Southern Company.

RESEARCH FUNDING

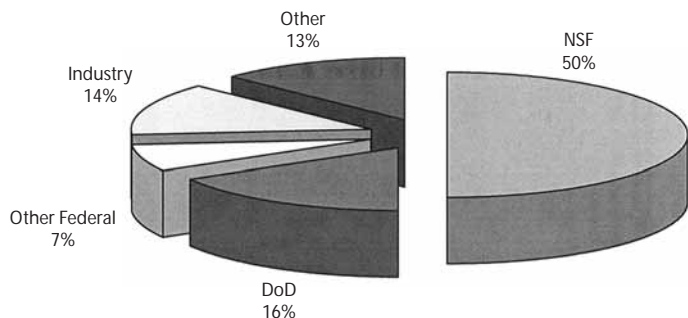
ECE faculty members acquired a record-breaking \$37,763,765 in research grants and contracts during the last fiscal year. This total represents 40.4 percent of the research funding in the College of Engineering, 25.2 percent of the research funding for the Georgia Tech academic units, and 12.9 percent of all Georgia Tech sponsored awards, including those of the Georgia Tech Research Institute.

During FY 03, ECE faculty members submitted 281 proposals, totaling \$142,301,293, to various governmental agencies and industrial sources.

Funded Grants and Contracts



Proposals



TOTAL ECE RESEARCH FUNDING \$37,763,765

ECE EXPENDITURES FOR FY 2003

State Funds

Salaries, Wages, and Fringe	\$19,410,348
Travel	200,644
Operating Expenses	1,929,838
Equipment	2,111,454
TOTAL STATE FUNDS	\$23,652,284

Departmental Sales, and Service

Salaries, Wages, and Fringe	\$72,506
Travel	51,394
Operating Expenses	66,455
Equipment	699
TOTAL DEPARTMENTAL SALES, AND SERVICE	\$191,054

Sponsored Funds

Salaries, Wages, and Fringe	\$14,785,993
Travel	1,044,838
Operating Expenses	5,957,107
Equipment	1,029,877
Indirect Expenses	6,342,217
TOTAL SPONSORED FUNDS	\$29,160,032

Research Consortium

Salaries, Wages, and Fringe	\$6,344,135
Travel	161,383
Operating Expenses	228,768
Equipment	180,185
TOTAL RESEARCH CONSORTIUM	\$6,914,471

GSFIC Bond Fund

Operating Expenses	\$1,070,568
Equipment	160,466
TOTAL GSFIC BOND FUND	\$1,231,034

TOTAL ECE EXPENDITURES \$61,148,875

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