

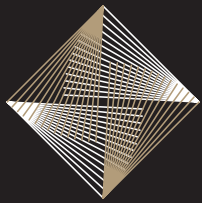
# *2004 - 2005 A nnual R eport*



*School of E lectrical and C omputer E ngineering*

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# A t A Glance

The School of Electrical and Computer Engineering is the largest of nine schools and departments in the College of Engineering and the largest individual school at Georgia Tech. In addition to its headquarters in Atlanta, the School's scope extends to southeastern Georgia universities via Georgia Tech Savannah and into Europe via Georgia Tech Lorraine.

## Faculty/Staff

Number of faculty (tenure-track)* .....	116
Joint appointments.....	4
Adjunct and part-time faculty .....	51
Professors Emeriti.....	22
Endowed professorships .....	28
Georgia Research Alliance Eminent Scholars .....	8
National Academy of Engineering members .....	5
IEEE Fellows .....	31
Optical Society of America Fellows .....	4
Presidential Early Career Award in Science and Engineering recipients.....	4
Academic professionals .....	15
Research faculty/personnel .....	131
Administrative staff .....	47

## Students

### Degrees Awarded\*\*

B.S.Cmp.E. ....	149
B.S.E.E. ....	236
M.S. ....	50
M.S.E.C.E. ....	180
Ph.D.....	83
Total.....	698

### Undergraduate Students (Fall Semester 2004)

Electrical engineering .....	926
Computer engineering .....	611
Total .....	1,537

### Graduate Students (Fall Semester 2004)\*\*\*

Doctoral.....	580
Special.....	7
Master of Science/M.S.E.C.E. ....	288
Total.....	875

## Grants and Contracts

Total funds received on external grants during FY 05.....	\$51,152,067
Number of proposals submitted to external agencies during FY 05 .....	335

\*Total includes Georgia Tech Savannah ECE faculty

\*\*Graduate program offers combined electrical and computer engineering degrees

\*\*\*Graduate degrees awarded totals include online master's/video and Georgia Tech Lorraine graduates

**ECE in top 10  
electrical  
and computer  
engineering  
undergraduate  
and graduate  
programs**

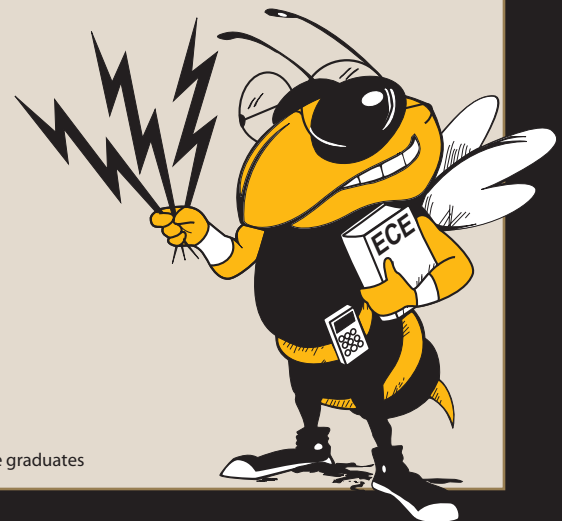


## Patents

Received in FY 05 .....	15
Five-year total .....	61

## Research and Education Areas

Bioengineering  
Computer engineering  
Digital signal processing  
Electric power  
Electromagnetics  
Electronic design and applications  
Microsystems  
Optics and photonics  
Systems and controls  
Telecommunications



# New Era in ECE

## Gary S. May Named Steve W. Chaddick School Chair of ECE

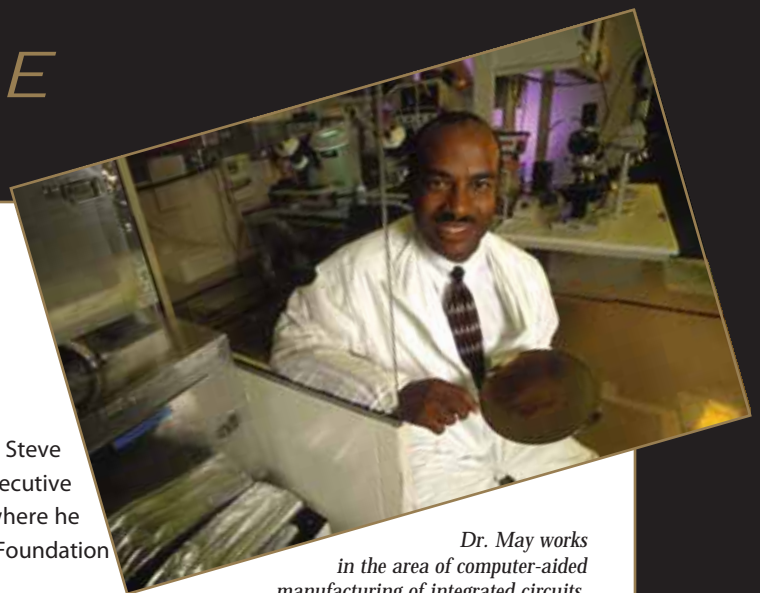
On May 1, 2005, Gary S. May took the helm at ECE as the Steve W. Chaddick School Chair. Previously, Dr. May was the executive assistant to Georgia Tech President G. Wayne Clough, where he served as the president's chief liaison, and the Motorola Foundation Professor in the School of ECE.

Coming into the School's top leadership role, Dr. May's priorities include increased focus on development and communications activities, enhanced and increased diversity of the ECE student body and faculty, creation of more hands-on engineering activities earlier in the undergraduate program, and more faculty pursuit of research commercialization and entrepreneurial activities.

Dr. May's research and educational interests are in computer-aided manufacturing of integrated circuits. The author of over 200 technical publications, he has written one textbook, *Fundamentals of Semiconductor Fabrications*, and contributed to portions of 14 additional books. Dr. May has graduated 14 Ph.D. students who work at the world's leading universities, research institutes, and electronics companies. Through individual and collaborative efforts, he has acquired over \$49 million in research funding from both governmental agencies and corporations, and he is a longstanding participant in the Packaging Research Center. From 1994-2001, he was on the editorial board for the prestigious *IEEE Transactions on Semiconductor Manufacturing*, with the last four years spent as editor-in-chief.

A tireless advocate for minority engineering education, Dr. May founded and leads two highly successful Georgia Tech initiatives—the Summer Undergraduate Research in Engineering/Science Program and the Facilitating Academic Careers in Engineering and Science Program—that have secured a combined \$12 million of support from the National Science Foundation. While SURE motivates underrepresented minority undergraduates to consider graduate studies in engineering and science, FACES encourages graduate-level minority students to pursue doctorates and academic careers in these areas. Additionally, Dr. May serves on the national advisory board of the National Society of Black Engineers and is the vice chair for the National Science Foundation's National Advisory Committee for Engineering.

*Dr. May leads the faculty procession during Georgia Tech's fall 2004 commencement.*



*Dr. May works in the area of computer-aided manufacturing of integrated circuits.*



## CAREER HIGHLIGHTS

### Education

B.E.E., Georgia Tech, 1985  
M.S. E.E.C.S., University of California at Berkeley, 1988  
Ph.D. E.E.C.S., University of California at Berkeley, 1991

### ECE and Georgia Tech

Assistant Professor, 1991-95  
Founder and Director, Summer Undergraduate Research in Engineering/Science Program, 1992-present  
Associate Professor, 1995-2000  
Founder and Director, Facilitating Academic Careers in Engineering and Science, 1998-present  
Professor, 2000  
Motorola Foundation Professor, 2001-05  
Associate Chair for ECE Faculty Development, 2001-02  
Executive Assistant to Georgia Tech President G. Wayne Clough, 2002-05  
Steve W. Chaddick School Chair of ECE, 2005-

## *Dear Colleagues,*

*Since its creation in 1896, the School of Electrical and Computer Engineering has been an integral part of Georgia Tech. During 2004-05, the School of ECE continued on its course of growth and innovation. Our research awards totaled a record breaking \$51.1 million, a \$5 million increase from just over \$46 million in FY 04, and represented a wide spectrum of activity from homeland security and deep space exploration to renewable energy sources and unmanned aerial vehicle testing and development.*

*Industrial-academic partnership was stronger than ever in individual faculty research efforts and in research centers. The new Samsung Design Center, housed at the Georgia Electronic Design Center, is an example of such collaboration. Our knack for entrepreneurialism is illustrated by CardioMEMS, an Advanced Technology Development Center company started by ECE faculty member Mark Allen, which is pioneering a new breed of testing devices to monitor patients with heart problems.*

*On the educational front, we graduated 385 undergraduate students (including 27 at GT Savannah), 230 master's students, and 83 Ph.D. students. We have also expanded our efforts through the creation of new international education programs and a concentrated focus on K-12 outreach to promote engineering and science education and career opportunities.*

*Recognition of ECE faculty members in terms of prestigious awards and other forms of recognition also reflected this high level of quality. Four faculty members were named IEEE Fellows, and four others received Institute-level awards including Georgia Tech's most recent Class of 1934 Distinguished Professor Award recipient, Tom Gaylord. Many students also received noteworthy recognitions, as Anthony Hylick and John Parish who were named Gates Cambridge and Goldwater scholars, respectively. These indicators were also acknowledged by external sources, as U.S. News and World Report now ranks both our electrical engineering and computer engineering graduate programs sixth in the nation.*

*In short, ECE blends the theoretical with the practical a philosophy that has characterized Georgia Tech since its inception. We are extremely proud of our outstanding faculty and students, and the ECE Advisory Board and our many corporate, individual, and foundation partners provide support in so many ways that are invaluable to our success. By working together, we are producing a culture of innovation and leadership that is vital to defining Georgia Tech as the preeminent 21<sup>st</sup> century research university.*

*I began my service as the Steve W. Chaddick School Chair of ECE in May 2005, and these stellar accomplishments are a testament to both the outstanding faculty in ECE and the leadership of my predecessor, Roger P. Webb. It is a tremendous privilege to lead ECE, and I look forward to many positive, productive years ahead.*



Gary S. May  
Steve W. Chaddick School Chair



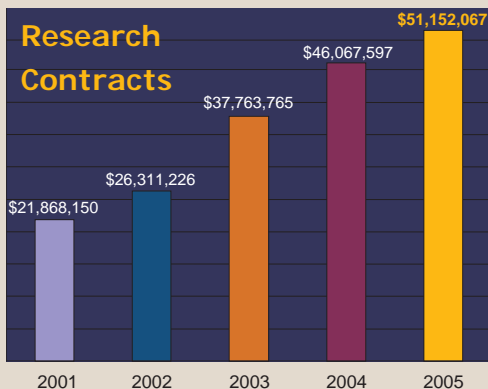
# Record Breaking Year



## All ECE Programs Rank in the Top 10

**6<sup>th</sup>** EE Graduate Program  
CmpE Graduate Program  
EE Undergraduate Program

**7<sup>th</sup>** CmpE Undergraduate



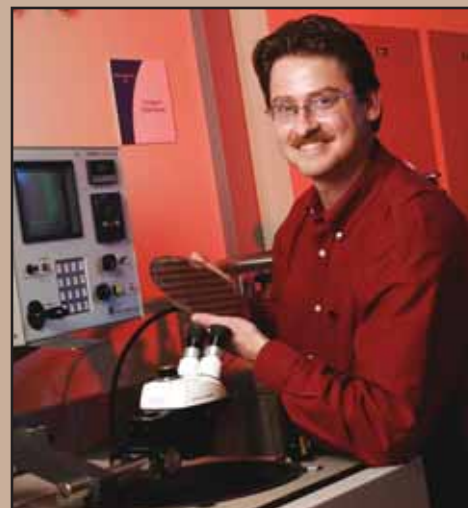
For the fourth consecutive year, ECE broke records in both research grants and contracts and research proposal activity. In FY 2005, ECE faculty acquired \$51,152,067 in research grants and contracts, which represented 39 percent of the research funding in the College of Engineering, 18 percent of Georgia Tech awards except those of Georgia Tech Research Institute, and 11 percent of all Georgia Tech sponsored awards, including GTRI.

During FY 2005, ECE faculty members submitted 335 proposals, totaling \$159,174,291, to various governmental agencies and industrial sources. These totals include research dollars acquired and proposed by ECE faculty in Atlanta, the Microelectronics Research Center, the Georgia Tech Broadband Institute, ECE faculty based at Georgia Tech Savannah, and the Georgia Electronic Design Center.

Additionally, ECE faculty had an extremely productive year in publishing their research in top academic journals and presenting their work at conferences and workshops around the world. In FY 05, ECE faculty members produced 5 books, 317 refereed journal papers, 606 refereed conference papers, 66 invited conference papers, 138 keynote addresses, and 86 patents or records of invention.

## NASA, ECE Create Electronics for Extreme Environments

**John D. Cressler**, Byers Professor in the microsystems area, received major new funding for his research in FY 05. His project, "Silicon-Germanium Integrated Electronics for Extreme Environments," was funded by NASA for \$14 million over the next four years and involves eight different university/industrial team members beyond Georgia Tech. The group is developing SiGe technology for electronics systems for NASA to use in lunar and Martian exploration and in interplanetary probes. Besides the advantages of low cost, high integration capability, and high speed, SiGe devices are ideally suited for space applications because of their natural radiation hardness, a key concern for all space electronics, and importantly their ability to operate in space's cryogenic temperatures, which are as cold as -230C (43K) on the surface of the moon.



John D. Cressler holds a 200 GHz silicon-germanium integrated circuit wafer at a cryogenic probe station capable of measuring temperatures to 200 degrees below zero Celsius.

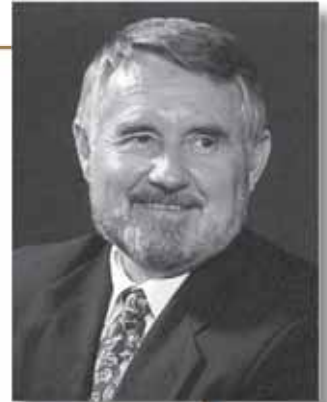
# Moving on...

## Roger P. Webb Retires after 41 Years of Service

On January 21, 2005, the Georgia Tech community honored Roger P. Webb, Steve W. Chaddick School Chair, and his 41 years of service to ECE and the Institute.

Dr. Webb's unassuming yet extraordinary style of servant-leadership enabled faculty to achieve many great things. During his tenure as school chair, ECE faculty established 15 new research centers and extended the School's global and regional reach to Georgia Tech Lorraine in France and to Georgia Tech Savannah. Grants and contracts acquisition quadrupled from \$10.1 million in 1990 to \$46 million in 2004, and doctoral degree production grew from 28 in 1990 to 105 in 2004.

"Roger had an exceptional ability to ignite the entrepreneurial spirit in his faculty and to let them pursue their 'thing' freely, without any artificial restraint," said Hans B. Püttgen, associate chair for External Affairs. "He found talent, directed it, and then let it grow." Indeed, Dr. Webb has surpassed the test of a true leader—to leave others with the ability, conviction, and dedication to continue in their quests for excellence and discovery.

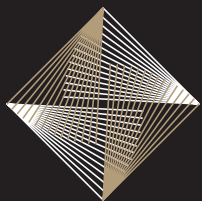


'57	<b>Entered University of Utah at age 16: Ford Foundation Scholarship</b>				
'59	<b>BS, Douglas Aircraft Company</b>				
	<b>MS, Univ. of Southern California</b>				
'61-'63	<b>Georgia Tech Fellow</b>				
'63	<b>Assistant Professor at Tech (20th faculty member)</b>				
'64	<b>PhD, Georgia Tech</b>				
'67	<b>Promoted to Associate Professor</b>				
'69	<b>Director, IEEE Atlanta Section</b>				
'72-'01	<b>Georgia Power Distinguished Professor: Coordinated efforts in instructional and research program development in electric power engineering</b>				
'74	<b>Promoted to Professor</b>				
'78	<b>ECE Associate Director</b>				
'83	<b>Edison Electric Institute Power Engineering Educator Award</b>				
'86	<b>IEEE Fellow</b>				
'88-89	<b>Vice Chair, IEEE Atlanta Section</b>				
'87-88	<b>Treasurer, IEEE Atlanta Section</b>				
'89-90	<b>Chair, IEEE Atlanta Section</b>				
'89	<b>ECE Acting Director</b>				
'90-'04	<b>ECE School Chair</b>				
'90	Joseph M. Pettit Microelectronics Research Center is formally dedicated				
'90	<b>Member, Electrical and Computer Engineering Department Heads Association (formerly NEEDHA)</b>				
'90	<b>Member, Southeastern Center for Electrical Engineering Education</b>				
'90	<b>Southeastern Association of Electrical Engineering Department Heads</b>				
'90	College of Computing Building opens, housing telecommunications and computer engineering faculty				
'91	Georgia Tech Lorraine—located in Metz, France—officially opens its doors as the Institute's European platform campus				
'91	The Manufacturing Research Center opens, housing ECE faculty and lab space in manufacturing-related areas				
'92	The U.S. Department of Energy (DoE) establishes the University Center for Excellence in Photovoltaics Research and Education (UCEP)				
'92	Georgia Tech Summer Undergraduate Program of Research in Electrical Engineering for Minorities is created (now known as Georgia Tech Summer Undergraduate Research in Engineering/Science Program)				
'93	The School of Electrical Engineering is renamed the School of Electrical and Computer Engineering				
'93	<b>Metro Atlanta Engineers: Engineer of the Year in Education Award</b>				
'94	The National Science Foundation establishes the Packaging Research Center as one of its first Engineering Research Centers				
'96	The National Electric Energy Testing, Research, and Applications Center is founded. The Center also has a R & D facility in Forest Park, Ga.				
'96	Rooftop photovoltaic power system begins operation at the Georgia Tech Aquatics Center, in time for the 1996 Summer Olympics				
'96	The Georgia Centers for Advanced Telecommunications Technology Building opens its doors to house faculty in telecommunications and digital signal processing				
'96-97	ECE celebrates 100 years on the Georgia Tech campus				
'97	ECE takes the lead role in an Institute-wide initiative to develop computer-enhanced education, most notably via the World Wide Web				
'97	Steven W. McLaughlin receives a Presidential Early Career Award for Scientists and Engineers during a White House ceremony				
'98	Texas Instruments Analog Graduate Fellows Program is established				
'98	The Georgia Tech Wireless Institute (now known as the Georgia Tech Broadband Institute) is created				
'98	The joint Georgia Tech Lorraine-Centre National de la Recherche Scientifique (GTL-CNRS) Laboratory is inaugurated in Metz, France				
'98-99	<b>President, Electrical and Computer Engineering Department Heads Association</b>				
'99	The Georgia Tech Regional Engineering Program opens in Savannah, Ga.				
'99	The Yamacraw Mission, a strategic economic development initiative in broadband telecommunications that enabled ECE to hire 26 new faculty members, was launched				
'99	Georgia Tech is named as one of three inaugural members of the Texas Instruments DSP Leadership Universities Program				
'99	ECE and other engineering students begin participating in FutureTruck, a nationwide, university-level competition to transform a traditional SUV into a low-emission, high-efficiency hybrid electric vehicle				
'99	Parker H. Petit Biotechnology Building opens, housing some ECE bioengineering faculty				
'00	ECE Capital Campaign ends with a final total of \$71,966,527, 10 percent of the Institute's total				
'00	<b>IEEE Millennium Medal Recipient</b>				
'00	The Center for Research in Embedded Systems and Technology is established				
'00	15 ECE faculty members receive IEEE Millennium Medals				
'01	ECE online master's program introduced				
'01	<b>Chair, Southeastern Center for Electrical Engineering Education (to present)</b>				
'01	ECE Chair renamed Steve W. Chaddick School Chair				
'01	<b>Board of Directors, International Engineering Consortium (to present)</b>				
'02	Ali Adibi receives a David and Lucile Packard Fellowship for Science and Engineering				
'02	IEEE student branch named largest in the world				
'03	Technology Square Research Building and Centergy Building open, housing ECE faculty in various disciplines and start-up company activities				
'02	The Arbutus Center for Distributed Engineering Education is formally established				
'03	Georgia Tech Savannah campus opens				
'03	Russell D. Dupuis receives the 2002 National Medal of Technology from U.S. President George W. Bush at a White House ceremony				
'03	U.A. Whitaker Building opens, housing ECE bioengineering faculty				
'03	Georgia Governor Sonny Perdue announces plans to create a Nanotechnology Research Center at Georgia Tech				
'03	National Nanotechnology Infrastructure Network names Georgia Tech as one of 13 participating universities				
'04	<b>Georgia Tech College of Engineering Hall of Fame</b>				
'04	Travels to India to discuss Georgia Tech presence in that country				
	<b>Special assistant to the provost/vice president of Academic Affairs on issues of strategic importance to the Institute, including Georgia Tech's Strategic Energy Initiative</b>				

Items in gold indicate Dr. Webb's individual achievements. Items in black are milestones and accomplishments that took place during 1990-2004.

*Certainly, Roger Webb did not achieve all of this by himself. However, he did enable and empower people to pursue and achieve very lofty goals.*

— Professor and Associate Chair Emeritus J. Alvin Connelly



# E xpansion

## Christopher W. Klaus Advanced Computing Building

Construction on the Christopher W. Klaus Advanced Computing Building, located on Ferst Drive, began in February 2004 and is due for completion in April 2006. The building, comprised of 135,000 assignable square feet, will house research and classroom labs, faculty offices, classrooms, a 200-seat auditorium, and an integrated parking structure accommodating 540 vehicles. The building will house approximately 34 faculty members from ECE.



## Georgia Tech Savannah

The Technology and Engineering Campus is the home of Georgia Tech Savannah. Ten ECE faculty members are housed in two facilities—the Economic Development and Research Building (EDRB), which provides faculty and administrative offices, classrooms, instructional and research laboratories, and business incubator space—and the Program Administration and Resource Building, which contains offices, conventional and distance-learning classrooms, telecollaboration studios, senior design studios, student computer labs, the student lounge, and the GTS library.

### Enrollment (Fall 2004)

B.S.E.E.	37
B.S.Cmp.E.	23
M.S./M.S.E.C.E.	2
Ph.D.	9

### Degrees Awarded

B.S.E.E.	18
B.S.Cmp.E.	9



## Nanotechnology Research Center Building

The Nanotechnology Research Center Building, to be located at the intersection of Ferst Drive and Atlantic Drive, is nearing the end of its design phase. Construction is due to begin in May 2006, with completion slated for March 2008. This facility is composed of 90,000 assignable square feet, including a 30,000-square foot, tri-level clean room, and will contain additional state-of-the-art clean room laboratories to support education, research, and economic development activities associated with microelectronics, medicine, pharmaceuticals, nanoscience, and nanotechnology. ECE faculty will be among a host of interdisciplinary researchers using this facility.





## Georgia Tech Lorraine

Georgia Tech Lorraine was the Institute's first international campus. Since opening in 1991, more than 70 faculty members from Georgia Tech's Atlanta campus have been assigned to GTL for varying periods of time. Almost 250 graduate students in ECE, computer science, and mechanical engineering are regularly enrolled and seek degrees from not only Georgia Tech, but from partner European institutions under double degree programs.

### ECE Enrollment (Fall 2004)

Doctoral	10
Master of Science/M.S.E.C.E.	33



## Georgia Tech China

Led by G. Tong Zhou of ECE and Haizheng Li from the Ivan Allen College School of Economics, 44 students (10 from ECE) enrolled in the Shanghai Summer Program. The undergraduate program was centered at Shanghai Jiaotong University in Shanghai, China.

Chinese language, engineering, humanities, and social sciences courses, as well as opportunities for undergraduate research were provided. Monson H. Hayes, a professor in ECE's DSP group, taught ECE and industrial engineering courses. In addition to taking a normal load of three classes from those offerings, students also enrolled in complimentary non-credit courses offered by SJTU in Chinese cooking, Chinese painting, Chinese calligraphy, and Taijiquan (or Tai Chi).

SJTU is a leading engineering university comprised of several campuses, with 2,800+ faculty and nearly 38,000 full-time students. The Xuhui campus, located in the center of the city, was home to the 2005 Shanghai Summer Program. Starting in May 2006, a Georgia Tech-SJTU dual master's degree program in ECE will be offered, thus adding a graduate program component to GT China.



## Georgia Tech India

In December 2004, ECE Professor Vijay Madisetti led the delegation that discussed the potential of a Georgia Tech presence in India. The group met with academic, government, and industry leaders in Bangalore, Chennai, Hyderabad, and Mumbai and included ECE Professors Roger P. Webb, Rao R. Tummala, and Nikil Jayant.

The mission is to provide Tech students and faculty with academic, research, and cultural opportunities and allow Indian students and faculty to explore the diversity of Georgia Tech via an exchange program. This collaboration will also encourage economic development and commercialization for both areas.



*In fall 2005, Georgia Tech launched a new International Plan offering students a multi-cultural dimension to their undergraduate experience. ECE has played a key role in past development of global educational initiatives and is poised for even more future growth in this critical area.*

# 2005 ECE Award Winners

On April 28, 2005, ECE celebrated the end of the academic year by holding its fourth annual awards program. C. Dean Alford (BEE '76) and C. Meade Sutterfield (BEE '72), both members of the ECE Advisory Board, hosted the event, which honors the students, staff, and faculty who have shown exceptional dedication to their professions and studies, ECE, Georgia Tech, and the community as a whole.

This program was supported in part by the Honorable Daniel A. Webster, Florida State Senator representing the 9th District; Warren M. Batts (BEE '61); Framatome ANP, an AREVA and Siemens Company; and Milliken.

## STUDENT AWARDS

### Outstanding ECE Sophomore

**Award**.....R. Reeve Ingle  
Eta Kappa Nu, the honor society for ECE, honored the sophomore electrical or computer engineering student with the highest scholastic average by presenting a plaque and a check for \$250 from Milliken.

**ECE Junior Scholar Award**.....G. Wallace Tennille  
This award was presented to the student who has junior standing and has the highest GPA in ECE. The recipient was awarded a \$250 check from Milliken and a plaque.

### ECE Undergraduate Research

**Award**.....George Cadena  
This award recognized an undergraduate student who has demonstrated an unusually strong aptitude for research. The recipient was awarded a \$250 check from Milliken and a plaque.

### Most Outstanding ECE Senior Co-op

**Award**.....Benjamin Alexander Johnson  
This award was presented to the ECE co-op student who is considered of the highest caliber by their co-op employer. The recipient was awarded a \$250 check and a plaque. Funding for this award was provided by Mr. Warren Batts (BEE '61).

### Outstanding Service to Georgia's

**Community Award**.....Michael Rivera  
Investing time in community activities can have significant rewards for Georgia Tech in the future, and recognizing students who participate in and organize such activities helps to motivate other students to do the same. The recipient was awarded a \$250 check and a plaque.

**ECE Faculty Award**.....Anita Chow  
This award was given to the electrical or computer engineering student who, in the opinion of the ECE faculty, has done the most to improve the educational environment within ECE or Georgia Tech and has contributed significantly to both student welfare and student-faculty interactions. The recipient was awarded a \$250 check and a plaque.

### Outstanding Electrical Engineering

**Senior Award**.....Irene Chow  
Eta Kappa Nu, the honor society for ECE, honored the senior electrical engineering student who has a very high scholastic average and who plays an active role in extra-curricular activities. The award consisted of a plaque, engraving the name of the individual on a plaque in the Van Leer (ECE) Building, and awarding a check for \$750 from Framatome ANP.

### Outstanding Computer Engineering

**Senior Award**.....Vikram Raj  
Eta Kappa Nu, the honor society for ECE, honored the senior computer engineering student who has a very high scholastic average and who plays an active role in extra-curricular activities. The award consisted of a plaque, engraving the name of the individual on a plaque in the Van Leer (ECE) Building, and awarding a check for \$750.

**ECE Senior Scholar Award**.....Justin Kloos  
This award consisted of a plaque that is given to the electrical or computer engineering senior(s) with the highest academic average.



Undergraduate Awards: (l-r) G. Wallace Tennille, Justin Kloos, Benjamin Alexander Johnson, Michael Rivera, Anita Chow, Irene Chow, and Roger Webb



Graduate Awards: (l-r) Joseph Lee, Omid Momtahan, Jinyu Li, Mohanned Sinnokrot, and Roger Webb



Staff Awards: (l-r) Christine Sun, Thomas Champion, Roger Webb, and Ramzy Obaid



Faculty Awards: (l-r) Art Koblasz (received a Richard M. Bass/Eta Kappa Nu Outstanding Teacher Award at the Eta Kappa Annual Spring Picnic), Ian Akyildiz, Roger Webb, Alan Doolittle, and Magnus Egerstedt

### Colonel Oscar P. Cleaver Awards

.....Jinyu Li  
Mohanned Sinnokrot  
These awards were made to the outstanding graduate student(s) in ECE, as determined by scores made on the doctoral preliminary examinations during 2004-05. Each recipient received a cash award and a plaque.

### ECE Graduate Teaching Assistant

**Excellence Award**.....Joseph Lee  
Teaching undergraduates is one of ECE's most important missions. Teaching assistants are necessary to ensure that every student has the opportunity for personal attention during their course of study. The recipient was awarded a \$500 check and a plaque. Funding for this award was provided by Mr. Warren Batts (BEE '61).

### ECE Graduate Research Assistant

**Excellence Award**.....Omid Momtahan  
Hossein Pishro-Nik  
Research is the cornerstone to ECE's success. Nurturing bright and hardworking graduate research assistants (GRAs) are among the most important factors in ensuring that ECE remains a leader in the research community. These awards were given to the GRAs who have demonstrated particular excellence in performing their duties. The recipients were each awarded a \$500 check and a plaque.

## STAFF AWARDS

### Hats Off Performance

**Award**.....James Steinberg, Christine Sun  
These awards, each consisting of a \$1,000 check and a plaque, recognized the classified staff members who have demonstrated exceptional job performance and/or service to ECE above and beyond the call of duty.

**Research Spotlight Award**.....Thomas Champion  
This award was presented to a researcher who has made a significant contribution to research efforts in ECE. The awardee received a \$1,000 check and a plaque.

**Academic Spotlight Award**.....Ramzy Obaid  
This award was presented to the researcher, classified employee, or general faculty member who has made a significant contribution to the ECE teaching or academic program. The awardee received a \$1,000 check and a plaque.

## FACULTY AWARDS

### Outstanding Junior Faculty

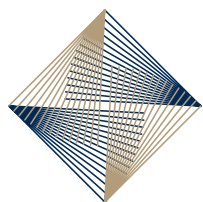
**Member Award**.....W. Alan Doolittle  
Magnus Egerstedt  
These awards, each consisting of a \$1,000 check and a plaque, recognized the most outstanding assistant professors during 2004-05.

### Distinguished Faculty Achievement

**Award**.....Ian F. Akyildiz  
This award, consisting of a \$5,000 check and a plaque, was presented to the senior faculty member who has made

In honor of Roger P. Webb, the ECE Advisory Board is endowing the ECE Awards Program. See details on page 31.





# Students

## STUDENT BODY PROFILE *(Based on Fall 2004 Enrollment)*

The official ECE student enrollment totaled 2,412, which represents all full-time and part-time undergraduate and graduate students engaged as of October 2004. Enrollments are also shown for ECE's undergraduate and graduate programs at remote campuses. The Georgia Tech Regional Engineering Program at Georgia Tech Savannah offers undergraduate and graduate degrees in four areas—civil, computer, electrical, and mechanical engineering. In fall 2004, 71 students were enrolled in electrical and computer engineering programs, making up the majority of students at GTS. Georgia Tech Lorraine, the Institute's platform campus into Europe, offers graduate degrees in both ECE and mechanical engineering, with a total of 43 students engaged. The online master's/video program had a total of 84 students as of fall 2004.

### Enrollment

	Total	Asian	Black	Hispanic	American Indian/ Alaskan Native	White	Multi- Racial	Female
B.S.E.E.	926	311	122	33	3	453	4	112
B.S.Cmp.E.	611	170	54	35	1	344	7	45
<b>Total</b>	<b>1,537</b>	<b>31%</b>	<b>12%</b>	<b>4%</b>	<b>&gt;1%</b>	<b>52%</b>	<b>&gt;1%</b>	<b>10%</b>
M.S./M.S.E.C.E.	288	77	17	14	0	172	8	33
Special	7	1	0	1	0	5	0	0
Ph.D.	580	332	29	20	1	195	3	64
<b>Total</b>	<b>875</b>	<b>47%</b>	<b>5%</b>	<b>4%</b>	<b>&gt;1%</b>	<b>42%</b>	<b>&gt;1%</b>	<b>11%</b>
<b>Grand Total</b>	<b>2,412</b>							

### Georgia Tech Savannah Campus

B.S.E.E.	37	5	4	0	0	28	0	1
B.S.Cmp.E.	23	2	3	0	0	18	0	1
<b>Total</b>	<b>60</b>	<b>12%</b>	<b>12%</b>	<b>0%</b>	<b>0%</b>	<b>76%</b>	<b>0%</b>	<b>3%</b>
M.S./M.S.E.C.E.	2	0	0	0	0	2	0	0
Ph.D.	9	7	1	0	0	1	0	2
<b>Total</b>	<b>11</b>	<b>64%</b>	<b>9%</b>	<b>0%</b>	<b>0%</b>	<b>27%</b>	<b>0%</b>	<b>18%</b>
<b>Grand Total</b>	<b>71</b>							

### Georgia Tech Lorraine Campus

M.S.	33	5	3	0	0	25	0	4
Ph.D.	10	2	0	0	0	8	0	0
<b>Total</b>	<b>43</b>	<b>16%</b>	<b>7%</b>	<b>0%</b>	<b>0%</b>	<b>77%</b>	<b>0%</b>	<b>9%</b>

### Online Master's/Video

M.S.	82	15	3	4	0	59	1	8
Ph.D.	2	2						
<b>Total</b>	<b>84</b>	<b>20%</b>	<b>4%</b>	<b>5%</b>	<b>0%</b>	<b>70%</b>	<b>1%</b>	<b>15%</b>

### The average entering...

#### Freshman Electrical Engineering Student

High school GPA	3.72
SAT verbal score	640
SAT math score	710

#### Freshman Computer Engineering Student

High school GPA	3.7
SAT verbal score	635
SAT math score	695

#### Average Entering Master's Student

Undergraduate GPA	3.66
GRE analytical score	665
GRE quantitative score	754
GRE verbal score	516

#### Average Entering Doctoral Student

Undergraduate GPA	3.58
GRE analytical score	734
GRE quantitative score	781
GRE verbal score	582



### Gates Cambridge Scholarship

Anthony Hylick, a senior computer engineering major, began studies at England's University of Cambridge in fall 2005 as a winner of the highly esteemed Gates Cambridge Scholarship. Mr. Hylick is the third Georgia Tech recipient of this prestigious award, created by Microsoft founder Bill Gates, and was one of approximately 100 students chosen from an international pool of candidates during spring 2005.

Mr. Hylick, who graduated in August 2005, will use this award to study for a Ph.D. in computer science, specifically in the area of reconfigurable computer architecture, techniques, and designs.



### Goldwater Scholarship

John Parish, a junior electrical engineering major, was chosen as one of 320 recipients of the Barry Goldwater Scholarship in March



2005. Named in honor of the former Arizona senator, the Barry M. Goldwater Scholarship Program fosters and encourages outstanding students to pursue careers in mathematics, natural sciences, and engineering.

A co-op student with the U.S. Department of Defense, Mr. Parish spent summer 2005 working with Byers Professor Steven W. McLaughlin on developing a method for encrypting communications that will be able to withstand the growing power of computers to crack them. As for his future plans, Mr. Parish plans to earn a doctorate and pursue a research career.



### NSF Graduate Fellowships

Ryan Pirkel and June Zhang, both spring 2005 electrical engineering graduates, were awarded NSF Graduate Fellowships. They both worked as undergraduate researchers in the Propagation Group, led by Assistant Professor Gregory D. Durgin.

Ms. Zhang plans to pursue a Ph.D. in electrical engineering specializing in telecommunications or information theory at Stanford University.

Mr. Pirkel is pursuing a M.S.E.E. degree at Georgia Tech and plans to study for his Ph.D. in electrical engineering in the future.

## Student Honors

### Sigma Xi Honors

Raviv Raich received a Best Ph.D. Thesis Award for his thesis entitled "Nonlinear System Identification and Analysis with Applications to Power Amplifier Modeling and Power Amplifier Predistortion." Dr. Raich graduated with his Ph.D. in spring 2004. His Ph.D. advisor was G. Tong Zhou. Dr. Raich is currently a postdoctoral fellow in the Department of Electrical Engineering and Computer Science at the University of Michigan at Ann Arbor.

Siavash Pourkamali received a Best M.S. Thesis Award for his thesis entitled "Electrically-Coupled MEMS Bandpass Filters." He graduated with his M.S. in spring 2004. Mr. Pourkamali's M.S. advisor was Farrokh Ayazi. Mr. Pourkamali is continuing his studies on the Ph.D. level in Dr. Ayazi's group.

### Georgia Tech Scholarships

**Tegan Counts** received a James G. and Mary G. Wohlford Scholarship for his excellent record as a student, co-op employee, and service to the community.

**Yamille Delvalle** received a Georgia Tech Women's Forum Scholarship for outstanding performance in the classroom.

**R. Reeve Ingle** received a Georgia Tech Faculty Women's Club Scholarship for good academic standing. This scholarship is given to children of Georgia Tech employees.

**Pelham David Norville** received an Auxiliary Services IMPACT Scholarship for his role as a student leader of the Georgia Tech community.

### Georgia Tech Awards

**Shilo Ayalon, David Allen Bauer, William Preston Galle, Ehsan Shah Hosseini, Tushar Kumar, Dwi Sianto Mansjur, Joy Mazumdar, Saeed Mohammadi, Muhammad Nisar, and Juan Felix Torres** received Outstanding ECE Graduate Teaching Assistant Awards at the ECE Eta Kappa Nu Spring Picnic.

**Anthony Hylick** received the AESO Systems Graduate Minority Engineering Award.

**Eric W. Southard** received the Robert Engineering Award.

**G. Wallace Tennille** and **Chin H. Yong** received the Henry Ford II Scholar Award.

### Industry Awards

**Aravind Velayutham** received Motorola's University Partnership in Research Award, presented by the company's Science Advisory Board Associates. Mr. Velayutham, a Ph.D. student who is advised by Raghupathy Sivakumar, received the award for his presentation, "TP: A Run-time Reconfigurable Transport Layer Framework for Mobile Devices."

**Alenka Zajic** received the Daniel E. Noble Fellowship Award, presented jointly by Motorola and the IEEE Vehicular Technology Society to promote graduate-level study in vehicular technology. Ms. Zajic's Ph.D. advisor is Gordon L. Stüber.



## Degrees Awarded

	Total	Asian	Black	Hispanic	White	American Indian/ Alaskan Native	Multi- Racial	Female
B.S.E.E.	218	74	33	7	99	4	1	35
B.S.Cmp.E.	140	44	10	11	72	2	1	6
B.S.E.E./GT Savannah	18	1	2	0	15	0	0	1
B.S.Cmp.E./GT Savannah	9	3	0	0	6	0	0	2
<b>Total</b>	<b>385</b>	<b>32%</b>	<b>12%</b>	<b>5%</b>	<b>50%</b>	<b>2%</b>	<b>1%</b>	<b>11%</b>
M.S.	50	36	2	0	12	0	0	9
M.S.E.C.E.	180	42	14	7	114	3	0	23
Ph.D.	83	53	1	4	25	0	0	8
<b>Total</b>	<b>313*</b>	<b>42%</b>	<b>5%</b>	<b>4%</b>	<b>48%</b>	<b>1%</b>	<b>0%</b>	<b>13%</b>
<b>Grand Total</b>	<b>698</b>	<i>*Degree total includes GTL and online master's graduates</i>						



## PH.D. STUDENTS GRADUATED

Eighty-three students graduated with their doctoral degrees in 2004-05. Students are grouped by semesters of graduation; their advisors, thesis titles, and employment status are also listed.

### Summer 2004

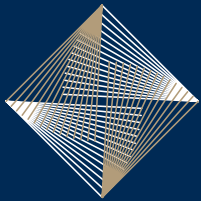
<b>Amer Atrash</b>	Hertling	Data Bus Deskewing Systems in Digital CMOS Technology	Technical staff, Automotive Group of Texas Instruments, Dallas, Tex.
<b>Joshua Bergman</b>	Laskar	Development of Indium Arsenide Quantum Well Electronic Circuits	Technical staff, Rockwell Scientific Corp., Thousand Oaks, Calif.
<b>Santithorn Bunchua</b>	S. Wills	Fully Distributed Register Files for Heterogeneous Clustered Microarchitectures	Assistant professor, Assumption University, Bangkok, Thailand
<b>Fatma Caliskan</b>	Peterson	Electromagnetic Analysis of Planar Layered Structures	Signal integrity engineer, Intel, Chandler, Ariz.
<b>José Gonzalez</b>	Mersereau	Image and Texture Analysis Using Biorthogonal Angular Filter Banks	Assistant professor, Department of Electrical Engineering, University of Texas at El Paso
<b>Luis Gutierrez Zea</b>	Vachtsevanos	Adaptive Mode Transition Control Architecture with an Application to Unmanned Aerial Vehicles	Professor, Universidad Pontificia Bolivariana, Medellin, Colombia
<b>Tyson Hall</b>	Anderson	Field-Programmable Analog Arrays: A Floating-Gate Approach	Assistant professor, School of Computing, Southern Adventist University, Collegedale, Tenn.
<b>Hung Yun Hsieh</b>	Sivakumar	Addressing Network Heterogeneity and Bandwidth Scarcity in Future Wireless Data Networks	Assistant professor, Department of Electrical Engineering and Graduate Institute of Communications Engineering, National Taiwan University, Taipei, Taiwan
<b>Jeng Shiann Jiang</b>	Ingram	Measurement, Modeling, and Performance of Indoor MIMO Channels	Senior algorithm engineer, Himax, Inc., Taipei, Taiwan
<b>Shantanu Kangude</b>	Copeland	CSMA with Implicit Scheduling through State-Keeping: A Distributed MAC Framework for QoS in Broadcast LANs	Electrical design engineer, Texas Instruments, Dallas, Tex.
<b>Woopoung Kim</b>	Swaminathan	Development of Measurement-Based Time-Domain Models and Its Application to Wafer Level Packaging	Design engineer, Rambus, Inc., Los Altos, Calif.
<b>Sven Krasser</b>	Owen	Adaptive Measurement-Based Traffic Engineering in Packet-Switched-Radio Access Networks	Postdoctoral fellow, School of ECE, Georgia Institute of Technology, Atlanta, Ga.
<b>Nancy List</b>	Williams	Low-Complexity Interleaver Design for Turbo Codes	Staff, MIT Lincoln Laboratory, Lexington, Mass.
<b>Aravind Nayak</b>	Barry	Iterative Timing Recovery for Magnetic Recording Channels with Low Signal-to-Noise Ratio	System architect, Agere Systems, Longmont, Colo.
<b>Seung-Jong Park</b>	Sivakumar	Energy-Aware Topology Control and Data Delivery in Wireless Sensor Networks	Assistant professor, Department of Computer Science, Louisiana State University, Baton Rouge, La.
<b>Youngcheol Park</b>	Kenney	Adaptive Digital Predistortion Linearization of Frequency Multiplier for Dual-Band Transmission Systems	Senior engineer, Samsung Electronics, Seoul, South Korea
<b>Kyeong Keol Ryu</b>	Mooney	Automated Bus Generation for Multi-Processor SOC Design	Samsung, South Korea
<b>Susanta Sengupta</b>	P. Allen	Technology-Independent CMOS Op Amp in Minimum Channel Length	Research engineer II, School of ECE, Georgia Institute of Technology, Atlanta, Ga.
<b>Joon Hyun Sung</b>	Barry	Transmitter Strategies for Closed-Loop MIMO-OFDM	Research staff, Samsung Advanced Institute of Technology, Suwon, South Korea
<b>Narayanan Varadarjan</b>	Barry	The Design of Linear Space Time Codes for Quasi Static Flat Fading Channels	Electrical design engineer, Texas Instruments, Dallas, Tex.

<b>Jaikrishna Venkatesan</b>	Scott	Investigation of the Double-Y Balun for Feeding Pulsed Antennas	NASA Jet Propulsion Lab, Pasadena, Calif.
<b>Ricardo Villalaz</b>	Gaylord	Volume Grating Couplers for Optical Interconnects Analysis, Design, Fabrication, and Testing	Engineer, Intel Corporation, Portland, Ore.
<b>Zhijie Xiong</b>	P. Allen	Radio Frequency Low Noise and High Q Integrated Filters in Digital CMOS Processes	Engineer, Skyworks, Newport Beach, Calif.
<b>Yeo-Sun Yoon</b>	McClellan	Direction of Arrival Estimation for Wideband Sources Using Sensor Arrays	Senior engineer, Samsung Thales Co., Ltd. , Sungnam, South Korea
<b>Fall 2004</b>			
<b>David Arnold</b>	M. Allen	Magnetic Machines for Microengine Power Generation	Postdoctoral fellow, School of ECE, Georgia Institute of Technology, Atlanta, Ga.
<b>Abhishek Bandyopadhyay</b>	Hasler	Matrix Transform Imager Architecture for On-Chip Low-Power Image Processing	Engineer, Analog Devices, Wilmington, Mass.
<b>Lewis Baumstark</b>	L. Wills	Extracting Data-Level Parallelism from Sequential Programs for SIMD Execution	Assistant professor, Department of Computer Science, University of West Georgia, Carrollton, Ga.
<b>Nathan Bushyager</b>	Tentzeris	Novel Adaptive Time Domain Techniques for the Modeling and Design of Complex RF and Wireless Structures	Electronics engineer, Northrop Grumman, Linthicum, Md.
<b>Carl Chun</b>	Laskar	Investigation of Integrated Circuits for High Data-Rate Optical Data Links	Self-employed consultant in San Jose, Calif.
<b>Brian Delaney</b>	Jayant	Reduced Energy Consumption and Improved Accuracy for Distributed Speech Recognition in Wireless Environments	Technical staff, MIT Lincoln Laboratory, Lexington, Mass.
<b>Jian Fang</b>	Akyildiz	Advanced Transport Protocols for Space Communications	Software engineer, Jewelry Television, Knoxville, Tenn.
<b>John Glotzbach</b>	Schafer	A Color Filter Array Interpolation Method Based on Sampling Theory	Software engineer, Texas Instruments, Dallas, Tex.
<b>Tamir Hegazy</b>	Vachtsevanos	A Distributed Approach to Dynamic Autonomous Agent Placement for Tracking Moving Targets with Application to Monitoring Urban Environments	Postdoctoral associate, Center for Process Systems Engineering/School of Chemical and Biomolecular Engineering, Georgia Institute of Technology, Atlanta, Ga.
<b>Ryan Hersey</b>	Richards	Adaptive Detection and Estimation Using a Conformal Array Antenna	Research engineer, GTRI-Cobb County Research Facility, Smyrna, Ga.
<b>Seok Hun Hyun</b>	Brooke	Design of High-Speed Laser Driver Using Standard CMOS Technology for Optical Data Transmission	Research engineer, Department of Electrical and Computer Engineering, Duke University, Durham, N.C.
<b>Zhenrong Jin</b>	Cressler	Low-Frequency Noise in SiGe HBT BiCMOS Technology	Staff engineer, IBM Microelectronics, Burlington, Vt.
<b>Daek Kim</b>	Brooke	Design of Robust and Flexible On-Chip Analog-to-Digital Conversion Architecture	Research engineer, Department of Electrical and Computer Engineering, Duke University, Durham, N.C.
<b>Hasung Kim</b>	Stüber	Turbo-Like Coding for Spread-Spectrum Communications	Technical staff, Samsung, South Korea
<b>Piya Kovintavewat</b>	Barry	Timing Recovery Based on Per-Survivor Processing	Lecturer and researcher, Telecommunications Program on the Faculty of Science and Technology, Rajabhat University, Nakhon Pathom, Thailand
<b>Matthew Kucic</b>	Hasler	Analog Computing Arrays	Engineer (and co-founder), GTronix, Fremont, Calif.
<b>Hung-Fei Kuo</b>	Jokerst	Thin Film Lasers Integrated with Planar Waveguides	Postdoctoral fellow, School of ECE (Packaging Research Center), Georgia Institute of Technology, Atlanta, Ga.
<b>Jaehwan Lee</b>	Mooney	Hardware/Software Deadlock Avoidance for Multiprocessor Multiresource System on a Chip	Assistant professor, Department of Electrical and Computer Engineering, Indiana University-Purdue University Indianapolis
<b>Jifeng Mao</b>	Swaminathan	Modeling of Simultaneous Switching Noise in On-Chip and Package Power Distribution Networks Using Conformal Mapping Finite Difference Time Domain and Cavity Resonator Methods	Engineer, Optimal Corporation, San Jose, Calif.
<b>Apurva Mody</b>	Stüber	Signal Acquisition and Tracking for Fixed Wireless Access MIMO-OFDM	Communications engineer, France Telecom, France
<b>Marc Niethammer</b>	Tannenbaum	Dynamic Level Sets for Visual Tracking	Postdoctoral fellow, School of ECE, Georgia Institute of Technology, Atlanta, Ga.
<b>Ketan Patel</b>	Ralph	Spatially Resolved Equalization: A New Concept in Intermodal Dispersion Compensation for Multimode Fiber	Optoelectronic Device and Packaging Division, Opticomp Corporation, Zephyr Cove, N.J.
<b>Gregory Rohling</b>	Clements	Multiple Objective Evolutionary Algorithms for Independent Computationally Expensive Objectives	Senior research engineer, GTRI, Atlanta, Ga.
<b>Biranchinath Sahu</b>	Rincón-Mora	Integrated Dynamically Adaptive Supplies for Linear RF Power Amplifiers in Portable Applications	Design engineer, Silicon Labs, Inc., Austin, Tex.
<b>Chung-Seok Seo</b>	Chatterjee	Physical Design of Optoelectronic System on a Chip/Package Using Electrical and Optical Interconnects: CAD Tools and Algorithms	Senior design and test engineer at Jacket Micro Devices, Inc., Atlanta, Ga.
<b>Michael Shell</b>	Hughes	Cascaded All Optical Shared Memory Architecture Packet Switches Using Channel Grouping under Bursty Traffic	Unknown

<b>Paul Smith</b>	Hasler	Analog Architectures for Auditory Feature Extraction and Recognition	Engineer (and co-founder), GTronix, Fremont, Calif.
<b>Indal Song</b>	Brooke	Multi-Gbit/s CMOS Transimpedance Amplifier with Integrated Photodetector for Optical Interconnects	Employed in South Korea
<b>Bortecene Terlemez</b>	Brooke	Oscillation Control in CMOS Phase-Locked Loops	Cypress Semiconductor, Istanbul, Turkey
<b>Xiangdong Xuan</b>	Chatterjee	Analysis and Design of Reliable Mixed Signal CMOS Circuits	Test engineer, Texas Instruments, Dallas, Tex.
<b>Sangwoong Yoon</b>	Laskar	LC Tank CMOS Voltage Controlled Oscillators Using High Quality Inductors Embedded in Advanced Packaging Technologies	Senior design engineer, RF Micro Devices, Billerica, Mass.
<b>Hua Zhang</b>	Li	OFDM for Wireless Communications	SkyWorks Solutions, Inc., Irvine, Calif.

## Spring 2005

<b>Christopher Alvino</b>	Yezzi	Multiscale Active Contour Methods in Computer Vision with Applications in Tomography	Research scientist, Siemens Corporate Research, Princeton, N.J.
<b>Volkan Cevher</b>	McClellan	A Bayesian Framework for Target Tracking Using Acoustic and Image Measurements	Postdoctoral fellow, School of ECE, Georgia Institute of Technology, Atlanta, Ga.
<b>Ravi Chawla</b>	Hasler	Power-Efficient Analog Circuits and Systems to Perform Signal-Processing Using Floating-Gate MOS Device for Portable Wireless Applications	Engineer, Silicon Labs, Austin, Tex.
<b>Elizabeth Chesnutt</b>	Barry	Novel Turbo Equalization Methods for the Magnetic Recording Channel	Senior systems engineer, OnStar, Troy, Mich.
<b>Yuvraj Dhillon</b>	Chatterjee	Hierarchical Optimization of Digital CMOS Circuits for Power, Performance, and Reliability	Research engineer, Intel, Hillsboro, Ore.
<b>Abdulkadir Diril</b>	Chatterjee	Circuit Level Techniques for Power and Reliability Optimization of CMOS Logic	Hardware engineer, NVIDIA, Santa Clara, Calif.
<b>Thayne Edwards</b>	Frazier	Microfabricated Acoustic and Thermal Field-Flow Fractionation Systems	Postdoctoral fellow, Department of Bioengineering, University of Washington, Seattle, Wash.
<b>Majid Fozunbal</b>	Schafer	Coding and Information Theoretic Aspects of Multiple Antenna Channels	Technical staff, Hewlett-Packard Laboratories, Palo Alto, Calif.
<b>Ana Elisa Goulart</b>	Abler	Signaling Architectures for the Interaction of the Session Initiation Protocol and Quality of Service for Internet Multimedia Applications	Seeking employment
<b>Mark Hooper</b>	Hasler	Submicron CMOS Programmable Analog Floating-Gate Circuits and Arrays Using Charge Pumps	Unknown
<b>Xianghui Huang</b>	Habetler	Diagnostics of Air Gap Eccentricity in Closed-Loop Drive-Connected Induction Motors	Research engineer, General Electric Global R&D Center, Schenectady, N.Y.
<b>Jongmyon Kim</b>	S. Wills	Architectural Enhancements for Color Image and Video Processing on Embedded Systems	Engineer, Samsung, Seoul, South Korea
<b>Taehyun Kim</b>	Ammar	Scalable Video Streaming over the Internet	Senior engineer, Freescale Semiconductor, Austin, Tex.
<b>Venkatesh Krishnan</b>	Anderson	A Framework for Low Bit-Rate Speech Coding in Noisy Environments	Senior engineer, QUALCOMM, Inc., San Diego, Calif.
<b>Matthew Lee</b>	M. Smith	Acoustic Models for the Analysis and Synthesis of the Singing Voice	Postdoctoral fellow, School of ECE, Georgia Institute of Technology, Atlanta, Ga.
<b>Qingqing Liang</b>	Cressler	Systematic Analysis and Optimization of Broadband Noise and Linearity in SiGe HBTs	Device engineer, IBM, Hopewell Junction, N.Y.
<b>Moonkyun Maeng</b>	Laskar	Combined Digital/Wireless Link over the Multi-Mode Fiber with VCSEL Using CMOS-Based Feed-Forward Equalizer	Senior signal integrity engineer, Intel Corporation, Fremont, Calif.
<b>Priscilla Mohammed</b>	Steffes	Laboratory Measurements of the Millimeter Wavelength Opacity of Phosphine (PH <sub>3</sub> ) and Ammonia (NH <sub>3</sub> ) under Simulated Conditions for the Cassini-Saturn Encounter	Research associate, NASA, Goddard Space Flight Center, Greenbelt, Md.
<b>Carole Montarou</b>	Gaylord	Low-Level Birefringence Measurement Methods Applied to the Characterization of Optical Fibers and Interconnects	Technical staff, Intel Corporation, Hillsboro, Ore.
<b>Steven Nugent</b>	Meindl	A Second Generation Generic Systems Simulator for a Gigascale System-on-a Chip	Seeking employment
<b>Kaveh Shakeri</b>	Meindl	Power Distribution in Gigascale Integration	Technology device engineer, Cypress Semiconductor, San Jose, Calif.
<b>Nuttapong Srirattana</b>	P. Allen	High-Efficiency Linear RF Power Amplifiers Development	Senior design engineer, RF Micro Devices, Greensboro, N.C.
<b>Yudong Tan</b>	Mooney	Cache-Related Timing Analysis for Preemptive Multi-Tasking Real-Time Systems	NVIDIA, Santa Clara, Calif.
<b>Wang-Myong Woo</b>	Kenney	Hybrid Digital/RF Envelope Predistortion Linearization for High Power Amplifiers in Wireless Communication Systems	Research engineer, Samsung Electro-Mechanical Design Center, Georgia Institute of Technology, Atlanta, Ga.
<b>Heejoong Yoo</b>	Anderson	Low-Power Audio Input Enhancement for Portable Devices	Senior engineer, QUALCOMM, Inc., San Diego, Calif.
<b>Guangfan Zhang</b>	Vachtsevanos	Optimum Sensor Localization/Selection in a Diagnostic/Prognostic Architecture	Research engineer, Intelligent Automation, Inc., Rockville, Md.
<b>Yingchuan Zhang</b>	Heck	Product Quality Modeling and Control Based on Vision Inspection with an Application to Baking Processes	Seeking employment



# Student Activities

## STUDENT ORGANIZATIONS

The lifeblood of ECE is its students. The student branch of the Institute of Electrical and Electronics Engineers, Eta Kappa Nu, the ECE Student Advisory Council, the ECE Student-Faculty Committee, and the newly formed Women of Electrical and Computer Engineering not only provide students with opportunities for personal and professional development, but these groups also give valuable input to the School's faculty and administrators regarding student issues and concerns.

### IEEE Student Branch



IEEE officers from 2004-05 celebrate the end of the academic year with incoming officers for 2005-06.

Maintaining its stature as the world's largest student branch, the Georgia Tech IEEE group hosts seminar speakers from various companies and organizations on a weekly basis. They also sponsor a Student-Professional Awareness Conference each spring, and they participate in numerous competitions and conferences on the national and international levels.

#### 2004-05 IEEE Student Branch Officers and Chairs

Sriram Narasimhan, <i>Chair</i>	Biren Patel, <i>Publicity Chair</i>
Joe Yeager, <i>Vice Chair, External Relations</i>	Peter Sahlstrom, <i>Webmaster</i>
Cody Planteen, <i>Vice Chair, Internal Relations</i>	Mario Vittes, <i>Mailing Lists Manager</i>
Sourjo Basu, <i>Treasurer</i>	Troy Riberon, <i>Historian</i>
Parul Gupta, <i>Secretary</i>	W. Marshall Leach, <i>Branch Faculty Advisor</i>
Ryan Westafer, <i>Hardware Chair</i>	Chase Battaglio, <i>Branch Mentor</i>
Sulabh Patel, <i>Software Chair</i>	
Stephanie McLeod, Kevin Kung, <i>Social Chairs</i>	

### Eta Kappa Nu

HKN is the international honor society for electrical engineers; outstanding juniors, seniors, and graduate students are eligible for election to this program. They participate in community service projects throughout the year and host the weekly Bridge to Business meetings. HKN also sponsors the annual ECE Spring Picnic and several awards throughout the year, including the Richard M. Bass Eta Kappa Nu Outstanding Teacher Awards, which were presented to Gregory D. Durgin and Arthur Koblasz in spring 2005.

#### 2004-05 Eta Kappa Nu Officers

Amit Agarwal, <i>President</i>	G. Wallace Tennille, <i>Bridge Correspondent</i>
Angelique Yeung, <i>Vice President</i>	Patrick Phelan, <i>Graduate Liaison</i>
David Lindbergh, <i>Treasurer</i>	Ryan Westafer, <i>Webmaster</i>
Abhinav Saxena, <i>Corresponding Secretary</i>	Justin Vogt, <i>Banquet Chair</i>
Yohan Yoon, <i>Recording Secretary</i>	Charles Wang, <i>Service Project Coordinator</i>
Thomas Hanley, <i>Lab Supplies Coordinator</i>	Thomas K. Gaylord, <i>Faculty Advisor</i>

### Student Advisory Council/Student-Faculty Committee

The ECE Student Advisory Council meets with ECE administrators and the School's Advisory Board on a regular basis, and the Student-Faculty Committee works on various projects throughout the year to promote more interactions and better relations among students and faculty.

The ECE Fair made its debut in April 2005, providing students a chance to learn more about ECE research and the profession as a whole. The day included the launch of *ecesis*, an online webzine showcasing the artistic talents of ECE's students, faculty, and staff.

#### 2004-05 OFFICERS

##### ECE Student Advisory Council

Christopher Alvino  
Woosuk Choi  
Irene Dershin Chow  
Eric Clopper  
Siddharth (Sid) Easwar  
Adam Eisenman  
Gavin Ho  
James Holland  
Neil Joshi  
Jennifer Lee  
Eric Liu

Miguel Lopez  
Danny Nguyen  
Elizabeth A. Whitaker  
Christopher Wiczorek  
Matt Wiggins

##### ECE Student-Faculty Committee

James Holland, *Student Chair*  
Eric Liu, *Student Vice Chair*  
Neil Joshi, *Student Treasurer*  
Danny Nguyen, *Student Secretary*  
Peter Sahlstrom, *Information Officer*  
Jeffrey A. Davis, *Faculty Chair*



## NEW STUDENT ORGANIZATION FOR WOMEN FORMED

### Women of Electrical and Computer Engineering

Founded in fall 2004, the mission of WECE is to address the persistently low enrollment of women in the School by working to increase awareness of the opportunities for women in electrical and computer engineering and to challenge women to achieve their full potential as engineers and as leaders. The group has undertaken an energetic program of outreach to female students in ECE and to prospective female students throughout the last academic year. WECE's two major social events, a Halloween-Tech trivia party and a bowling party, attracted a wide cross-section of faculty, staff, and undergraduate and graduate students.

#### 2004-05 Women of Electrical and Computer Engineering Officers

Anita Chow, *President*  
Sara Hancock, *Vice President*  
Paige Carpentier, *Secretary*  
Ashley Coe, *Treasurer*  
Bonnie Heck and Douglas B. Williams, *Faculty Advisors*

## Outreach

ECE faculty, staff, and students took part in a number of ECE-sponsored and Georgia Tech-sponsored programs focused on K-12 outreach to promote awareness of engineering and science education, as well as to inform these students about career opportunities in these fields.

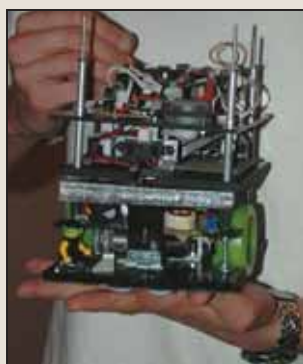
In addition, WECE conducted its own, targeted outreach to elementary, middle, and high school students throughout metropolitan Atlanta by visiting students on-site and hosting female student groups at Georgia Tech for campus and lab tours. To gain even further momentum in these outreach efforts, ECE alumni and industrial sponsors have been invited to become involved in this particular outreach initiative.

## Competitions

### 2005 Windows Embedded Student Challenge

Four ECE 4006 Senior Design Project students were among a field of 30 international teams competing in the Windows Embedded Student Challenge at Microsoft's world headquarters in Redmond, Wash. The ECE team—known as the “GT Ambulance Chasers”—was comprised of spring 2005 ECE graduates Brandon Harrington, Kevin Wright, Dan Boland, Brian Liu, and their faculty mentor, Professor James O. Hamblen. The ECE 4006 team designed a Secure Traffic-Light Emergency Management System, a wireless encrypted intelligent traffic light control system for use by emergency vehicles.

### Winners at IEEE SoutheastCon



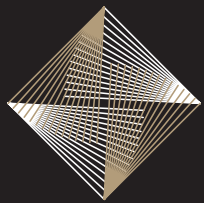
At the IEEE SoutheastCon, held in Fort Lauderdale, Fla. during spring 2005, the Tech IEEE student branch hardware team entered a robot into the IEEE Hardware Competition. Each round, the Tech IEEE Branch robot raced against an opponent with the objective of locating and collecting randomly positioned steel balls, taking the least time possible. The Tech robot won Best Mechanical Design for its precision movement and sturdy construction, and it also took Most Entertaining

honors for playing the Tech fight song or exclaiming “Go Yellow Jackets!” at opportune moments.

### 2005 FIRST LEGO League Challenge

*The Galactic Designers, an eight-member team from The Galloway School and Warren T. Jackson Elementary School of Atlanta and Sope Creek Elementary School and Dickerson Middle School in Marietta, Ga., claimed first prize for the second year in a row. Coached by David Turner, the Galactic Designers are (back row, L-R) Rand Elsbree, age 12; Danny Kreuz, age 10; Drew Eikhoff, age 12; and Sean Eikhoff, age 10 and (front row, L-R) Hailey Brown, age 11; Jake Turner, age 10; Sutton Birch, age 10; and Austin Mattheissen, age 12. The competition is supported by grants from the National Science Foundation, Kimberly Clark, and the Netherlands American Trust.*





# Faculty

One hundred sixteen faculty members were employed in ECE during 2004-05, with 70 percent holding tenure and all holding doctorates. The average age of the faculty was 47.

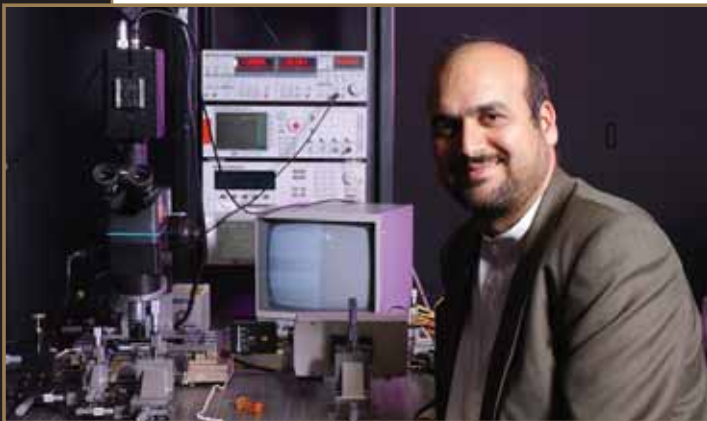
## Ali Adibi, David Anderson Named as PECASE Honorees

Ali Adibi and David V. Anderson were presented with the 2004 Presidential Early Career Awards for Scientists and Engineers, the nation's highest honor for promising young researchers within their areas of research, on June 13, 2005. Fifty-eight researchers from the U.S. were honored in a White House ceremony presided over by John H. Marburger, III, science advisor to President George W. Bush and director of the White House Office of Science and Technology Policy.

Nominated by the U.S. Department of Defense, Dr. Adibi was honored for his research contributions to optical storage by exploring two-center holographic recordings and his contributions to chip-scale all-optical information processing modules by exploring wavelength crystals and nanophotonic approaches. Dr. Adibi was also commended for outstanding teaching with his PECASE award.

Dr. Anderson was nominated by NSF for pioneering the design of embedded signal processing and control systems that perform significant processing in both analog and digital circuits. This research in cooperative analog-digital processing is enabling potential advances in low-power embedded systems and smart sensors, such as assistive devices for the hearing-impaired.

Eight federal departments and agencies annually nominate scientists and engineers at the start of their careers whose work shows exceptional promise for leadership at the frontiers of scientific knowledge during the 21<sup>st</sup> century. Participating agencies award these beginning scientists and engineers up to five years of funding to further their research in support of critical government missions. This is the first time that two PECASE awards have been given to faculty in the same academic unit in the same year.



*Ali Adibi is working with an automated setup for the detailed characterization of spatial and spectral properties of photonic crystals with very small feature sizes. Such miniaturized structures are very promising for integrated photonic circuits for applications such as optical communications and sensing.*



*David V. Anderson holds a prototype board for acoustic array processing. Computer monitors show development tools with code for configuring the array processing hardware.*

## FACULTY PROFILE

### Rank

Regents' Professors	4
Professors	61
Associate Professors	31
Assistant Professors	20
<b>Total</b>	<b>116*</b>

### Tenured

Regents' Professors	4
Professors	57
Associate Professors	20

### Diversity

Female	8
African-American	2
Asian	21
Hispanic	1
Multi-racial	1

*\*includes GT Savannah faculty and all faculty members employed during FY 2005*

## FACULTY DISTINCTIONS

Endowed professorships	28	Optical Society of America Fellows	4
Georgia Research Alliance Eminent Scholars	8	Presidential Early Career Award in Science and Engineering recipients	4
National Academy of Engineering members	5		
IEEE Fellows	31		



Deepak Divan



Elliot Moore



Shyh-Chiang Shen



F. Levent Degertekin

## NEW FACULTY

**Deepak Divan**, a professor in the electric power group, has established and now serves as the director of the Intelligent Power Infrastructure Consortium, which pursues multidisciplinary research into advanced concepts in power. The possibility of implementing a smarter power grid using 'power sensor-nets' is of particular interest; this technique would use embedded, low-cost, massively-dispersed sensors, actuators, and converters that are networked together to improve the reliability and utilization of the nation's power infrastructure. Before coming to Georgia Tech, he served as chair of the board and chief technology officer for Soft Switching Technologies, a spinoff company from the University of Wisconsin at Madison.

**Elliot Moore** is an ECE assistant professor at Georgia Tech Savannah, where he is involved in digital signal processing. Dr. Moore was a postdoctoral fellow and Ph.D. student in ECE's Center for Signal and Image Processing. His Ph.D. research involved the analysis of objectively measurable speech features and their relation to vocal affect and depression in a human voice. While a graduate student, Dr. Moore was a NSF Fellow, President's Fellow, and a Fellow in the Facilitating Academic Careers in Engineering Program.

**Shyh-Chiang Shen** is an assistant professor in microsystems. Before joining Tech in January 2005, Dr. Shen spent four months as a postdoctoral research associate at the University of Illinois, where he worked on GaN HBT and LET projects. Prior to his postdoctoral position, he was a senior processing engineer at Xindium Technologies in Champaign, Ill.

**F. Levent Degertekin** accepted a joint faculty appointment as an assistant professor in ECE; his primary appointment is with Tech's George W. Woodruff School of Mechanical Engineering. His main areas of interest are in microelectromechanical systems, acoustic and opto-acoustic devices, medical ultrasound imaging, and atomic force microscopy. Dr. Degertekin is a 2004 recipient of the NSF CAREER Award and presently serves as associate editor of the *IEEE Sensors Journal*.



ECE Regents Professor Gives Summer Commencement Address

*As the recipient of the Class of 1934 Distinguished Professor Award, Thomas K. Gaylord delivered the address to the graduates at Georgia Tech's 222<sup>nd</sup> commencement. Dr. Gaylord is pictured holding the Georgia Tech mace as he leads the faculty processional.*

## Professorships in FY 05

**James H. McClellan**, John and Marilu McCarty Chair of Electrical Engineering

**John D. Cressler**, Byers Professor

**Steven W. McLaughlin**, Byers Professor

**Russell M. Mersereau**, Joseph M. Pettit Professor

**Sudhakar Yalamanchili**, Joseph M. Pettit Professor

**Aaron D. Lanterman**, Demetrius T. Paris Professor

## Promotions and Tenure in FY 05

### Promotions

**Ali Adibi**, to Associate Professor

**Abhijit Chatterjee**, to Professor

**Steven W. McLaughlin**, to Professor

**Henry L. Owen**, to Professor

### Promotion to Associate Professor with Tenure

**Yucel Altunbasak**

**Robert J. Butera, Jr.**

**Vincent J. Mooney, III**

**Emmanouil M. Tentzeris**

**Anthony J. Yezzi, Jr.**

### Tenure

**David S. Citrin**

**John D. Cressler**

**Ian T. Ferguson**

**Chin-Hui Lee**



## REGENTS' PROFESSORS

### Thomas K. Gaylord

Julius Brown Chair Professor  
Ph.D., Rice University  
*Optics and photonics*  
OSA Fellow, 2005 OSA Esther Hoffmann Beller Medal "for his innovative teaching in optical science and engineering and his significant contributions in establishing Tech's optics and photonics program" and the Class of 1934 Distinguished Professor Award which recognizes sustained outstanding achievement in teaching, research, and service and is the highest honor given to a faculty member at Georgia Tech.

### Russell M. Mersereau

Joseph M. Pettit Professor  
Sc.D., Massachusetts Institute of Technology  
*Digital signal processing*

### Ajeet Rohatgi

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

### Glenn S. Smith

John Pippin Chair in Electromagnetics  
Ph.D., Harvard University  
*Electromagnetics; electronic design and applications*

## PROFESSORS

### Ian F. Akyildiz

Byers Professor in Telecommunications  
Ph.D., University of Erlangen  
*Telecommunications*

### Mark G. Allen

Joseph M. Pettit Professor in Microelectronics; Co-Director, Center for MEMS and Microsystems Technologies  
Ph.D., Massachusetts Institute of Technology  
*Microsystems*  
Georgia Tech Outstanding Faculty Leadership for the Development of Graduate Research Assistants Award for providing high quality leadership in direct research advising.

### Phillip E. Allen (Retired June 1, 2005)

Schlumberger Chair Professor in Microelectronics  
Ph.D., University of Kansas  
*Electronic design and applications*  
Dr. Allen joined ECE in 1984 as the Schlumberger Chair Professor in Microelectronics, and in 1989, he co-founded the Georgia Tech Analog Consortium.

### Thomas P. Barnwell, III

Director, Arbutus Center for Distributed Engineering Education; Arbutus Chair in Distributed Engineering Education; Georgia Research Alliance Eminent Scholar  
Ph.D., Massachusetts Institute of Technology  
*Digital signal processing*

### Douglas M. Blough

Co-Director, Center for Experimental Research in Computer Systems  
Ph.D., The Johns Hopkins University  
*Computer engineering*

### John A. Buck

Ph.D., University of California at Berkeley  
*Electromagnetics; optics and photonics*

### W. Russell Callen, Jr. (Retired June 1, 2005)

Ph.D., Stanford University  
*Optics and photonics*  
A faculty member since 1970, Dr. Callen has been one of ECE's most versatile instructors. For the last 15 years, he has been the administrator and principal instructor for Fundamentals of Engineering and Principles and Practice of Engineering, courses offered through Tech's Professional Education Office.

### Gee-Kung Chang

Byers Endowed Professor in Optical Networking; GRA Eminent Scholar  
Ph.D., University of California at Riverside  
*Optics and photonics; telecommunications*  
IEEE Fellow "for contributions to optical networking and label switching technologies" and an OSA Fellow.

### Abhijit Chatterjee

Ph.D., University of Illinois at Urbana-Champaign  
*Computer engineering*

### Mark A. Clements

Director, Interactive Media Technology Center  
Sc.D., Massachusetts Institute of Technology  
*Bioengineering; digital signal processing*  
IEEE Fellow "for contributions to speech signal processing and robust speech recognition."

### John A. Copeland

John H. Weitnauer, Jr. Technology Transfer Chair; GRA Eminent Scholar; Director, Communications Systems Center  
Ph.D., Georgia Institute of Technology  
*Telecommunications*

### John D. Cressler

Byers Professor  
Ph.D., Columbia University  
*Microsystems*

### Stephen P. DeWeerth

Ph.D., California Institute of Technology  
*Bioengineering*

### Deepak Divan

Director, Intelligent Power Infrastructure Consortium  
Ph.D., University of Calgary  
*Electric power*

### John F. Dorsey

Ph.D., Michigan State University  
*Systems and controls*

### Russell D. Dupuis

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

### Robert K. Feeney (Retired December 2004)

Ph.D., Georgia Institute of Technology  
*Electromagnetics; electronic design and applications; microsystems*  
In 1970, Dr. Feeney began his career with the ECE faculty and together with David R. Hertling, professor and ECE associate chair emeritus, they founded one of the first RF electronics educational programs.

### Ian T. Ferguson

Ph.D., University of St. Andrews in Scotland  
*Microsystems; optics and photonics*

### Elias N. Glytsis

Ph.D., Georgia Institute of Technology  
*Optics and photonics*

### Thomas G. Habetler

Ph.D., University of Wisconsin at Madison  
*Electric power*

### James O. Hamblen

Ph.D., Georgia Institute of Technology  
*Computer engineering*

### Ronald G. Harley

Duke Power Company Distinguished Professor  
Ph.D., London University  
*Electric power*  
IEEE Power Engineering Society Cyril Veinott Award "for his contributions to the analysis and design of electric machines and drive systems."

### Monson H. Hayes, III

Sc.D., Massachusetts Institute of Technology  
*Digital signal processing*

### Bonnie S. Heck

Ph.D., Georgia Institute of Technology  
*Computer engineering; systems and controls*  
Women in Engineering Excellence Faculty Mentoring Award for guidance of current and prospective students in and outside the classroom.

### Joseph L.A. Hughes

Associate Chair for ECE Academic Operations  
Ph.D., Stanford University  
*Computer engineering; microsystems; telecommunications*  
ECE Distinguished Educator Award from the ECE Division of the American Society for Engineering Education "for advancing ECE education through development and guidance of computer engineering undergraduate programs, leadership in electrical and computer engineering education, and extraordinary service to accreditation process."



**William D. Hunt**

Ph.D., University of Illinois at Urbana-Champaign  
*Bioengineering; microsystems*

**Ramesh C. Jain**

Rhesa "Ray" S. Farmer, Jr. Distinguished Chair in Embedded Experiential Systems; GRA Eminent Scholar  
Ph.D., Indian Institute of Technology at Kharagpur  
*Computer engineering; digital signal processing*

**Nikil S. Jayant**

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

**Biing-Hwang (Fred) Juang**

Motorola Foundation Chair Professor; GRA Eminent Scholar  
Ph.D., University of California at Santa Barbara  
*Digital signal processing; telecommunications*

**Bernard Kippelen**

Associate Director, Center for Organic Photonics and Electronics  
Ph.D., Université Louis Pasteur  
*Microsystems; optics and photonics*

**Joy Laskar**

Director, Georgia Electronic Design Center; Joseph M. Pettit Professor in Electronics  
Ph.D., University of Illinois at Urbana-Champaign  
*Electromagnetics; electronic design and applications; microsystems*  
IEEE Fellow "for contributions to the modeling and development of high frequency communication modules."

**W. Marshall Leach, Jr.**

Ph.D., Georgia Institute of Technology  
*Electromagnetics; electronic design and applications; microsystems*  
IEEE Fellow "for contributions to electroacoustics and near-field antenna measurements."

**Chin-Hui Lee**

Ph.D., University of Washington  
*Digital signal processing*

**James H. McClellan**

Byers Professor in Digital Signal Processing  
Ph.D., Rice University  
*Computer engineering; digital signal processing*

**Vijay K. Madiseti**

Ph.D., University of California at Berkeley  
*Computer engineering; digital signal processing*

**Gary S. May**

Steve W. Chaddick School Chair (effective May 2005); Executive Assistant to President G. Wayne Clough and Motorola Foundation Professor (titles held previous to May 2005)  
Ph.D., University of California at Berkeley  
*Microsystems; systems and controls*

**James D. Meindl**

Joseph M. Pettit Chair in Microelectronics; Director, Microelectronics Research Center  
Ph.D., Carnegie-Mellon University  
*Microsystems*  
2004 Aristotle Award from the Semiconductor Research Corporation. The award "acknowledges outstanding teaching in its broadest sense, emphasizing student advising and teaching during the research project."

**A.P. Sakis Meliopoulos**

Ph.D., Georgia Institute of Technology  
*Electric power; systems and controls*

**Steven W. McLaughlin**

Byers Professor and Research Director, Georgia Tech Lorraine  
Ph.D., University of Michigan at Ann Arbor  
*Telecommunications*

**Henry L. Owen**

Ph.D., Georgia Institute of Technology  
*Computer engineering; telecommunications*

**Krishna V. Palem**

Director, Center for Research on Embedded Systems and Technology  
Ph.D., University of Texas at Austin  
*Computer engineering*

**John B. Peatman**

Ph.D., Case Western Reserve University  
*Computer engineering*  
2006 IEEE Undergraduate Teaching Award  
"for a distinguished career of inspirational teaching and mentoring of undergraduate students in digital systems design."

**Andrew F. Peterson**

Associate Chair for ECE Faculty Development  
Ph.D., University of Illinois at Urbana-Champaign  
*Electromagnetics*

**Hans B. Püttgen**

Associate Chair for ECE External Affairs; President, Georgia Tech Lorraine; Director, National Electric Energy Testing, Research, and Applications Center; Georgia Power Distinguished Chair Professor  
Ph.D., University of Florida  
*Electric power*

**William T. Rhodes**

Ph.D., Stanford University  
*Optics and photonics*

**Jay H. Schlag** (Retired November 2004)

Associate Chair for ECE Operations  
Ph.D., Georgia Institute of Technology  
*Computer engineering*  
Dr. Schlag joined the School's faculty in 1967. He has been the primary contact for the facilities design of the Technology Square Research Building, the Klaus Advanced Computing Building, the Bunger-Henry Building renovation, and the forthcoming Nanotechnology Research Center Building; he remains as an associate chair on a half-time basis.

**Waymond R. Scott, Jr.**

Ph.D., Georgia Institute of Technology  
*Electromagnetics*

**Paul G. Steffes**

Associate Chair for ECE Graduate Affairs  
Ph.D., Stanford University  
*Electromagnetics; telecommunications*

**Gordon L. Stüber**

Joseph M. Pettit Professor in Communications  
Ph.D., University of Waterloo  
*Computer engineering; telecommunications*

**Madhavan Swaminathan**

Deputy Director, Packaging Research Center  
Ph.D., Syracuse University  
*Computer engineering; electromagnetics*

**Allen Tannenbaum**

Julian Hightower Professor  
Ph.D., Harvard University  
*Bioengineering; systems and controls*

**David G. Taylor**

Director, Center for Board Assembly Research; Associate Director, Manufacturing Research Center  
Ph.D., University of Illinois at Urbana-Champaign  
*Systems and controls*

**Rao R. Tummala**

Director, Packaging Research Center; Joseph M. Pettit Chair in Electronics Packaging; GRA Eminent Scholar  
Ph.D., University of Illinois at Urbana-Champaign  
*Computer engineering; microsystems*

**George J. Vachtsevanos**

Ph.D., The City University of New York  
*Bioengineering; systems and controls*

**Erik I. Verriest**

Ph.D., Stanford University  
*Optics and photonics; systems and controls*

**Yorai Y. Wardi**

Ph.D., University of California at Berkeley  
*Computer engineering; systems and controls; telecommunications*

**Roger P. Webb** (Retired December 2004)

Steve W. Chaddick School Chair  
Ph.D., Georgia Institute of Technology  
*Electric power*  
ECE Distinguished Alumnus Award at the University of Utah and the ECEDHA Outstanding Leadership and Service Award.

**D. Scott Wills**

Sc.D., Massachusetts Institute of Technology  
*Computer engineering*

**Sudhakar Yalamanchili**

Co-Director, Center for Experimental Research in Computer Systems; Associate Director, Center for Research in Embedded Systems and Technology; Joseph M. Pettit Professor  
Ph.D., University of Texas at Austin  
*Computer engineering*

## ASSOCIATE PROFESSORS

### Ali Adibi

Ph.D., California Institute of Technology  
*Optics and photonics*  
2005 PECASE Award - see story on page 16

### Yucel Altunbasak

Ph.D., University of Rochester  
*Digital signal processing*

### John R. Barry

Ph.D., University of California at Berkeley  
*Telecommunications*

### Miroslav M. Begovic

Ph.D., Virginia Polytechnic Institute and State University  
*Electric power*

### Oliver Brand

Co-Director, Center for MEMS and Microsystems Technologies  
Ph.D., ETH-Zurich  
*Microsystems*

### Robert J. Butera, Jr.

Ph.D., Rice University  
*Bioengineering; computer engineering*

### David S. Citrin

Ph.D., University of Illinois at Urbana-Champaign  
*Optics and photonics*

### K.-H. Michael Fan

Ph.D., University of Maryland  
*Systems and controls*

### A. Bruno Frazier

Co-Director, Center for MEMS and Microsystems Technologies  
Ph.D., Georgia Institute of Technology  
*Bioengineering; microsystems*

### Paul E. Hasler

Director, Georgia Tech Analog Consortium  
Ph.D., California Institute of Technology  
*Computer engineering; electronic design and applications*

### Christiana B. Honsberg

Ph.D., University of Delaware  
*Electric power; microsystems*

### Mary Ann Ingram

Ph.D., Georgia Institute of Technology  
*Telecommunications*

### Chuanyi Ji

Ph.D., California Institute of Technology  
*Telecommunications*

### David C. Keezer

Ph.D., Carnegie-Mellon University  
*Computer engineering; microsystems*

### J. Stevenson Kenney

ON Semiconductor Junior Professor  
Ph.D., Georgia Institute of Technology  
*Electronic design and applications; telecommunications*  
2005 IEEE Microwave Theory and Techniques Society Microwave Application Award "for power amplifier linearization for use in cellular/wireless systems."

### Arthur Koblasz

Ph.D., California Institute of Technology  
*Bioengineering*

### Ye (Geoffrey) Li

Ph.D., Auburn University  
*Telecommunications*

### Jennifer E. Michaels

Ph.D., Cornell University  
*Systems and controls*  
Women in Engineering Excellence Faculty Mentoring Award for guidance of current and prospective students in and outside the classroom.

### Thomas E. Michaels

Ph.D., Washington State University  
*Systems and controls*

### Linda S. Milor

Ph.D., University of California at Berkeley  
*Electronic design and applications*

### Vincent J. Mooney, III

Ph.D., Stanford University  
*Computer engineering*

### Stephen E. Ralph

Ph.D., Cornell University  
*Electromagnetics; microsystems; optics and photonics*

### David E. Schimmel

Ph.D., Cornell University  
*Computer engineering*

### Emmanouil M. Tentzeris

Ph.D., University of Michigan at Ann Arbor  
*Electromagnetics*

### Douglas B. Williams

Associate Chair for ECE Undergraduate Affairs  
Ph.D., Rice University  
*Digital signal processing*  
Women in Engineering Excellence Faculty Mentoring Award for guidance of current and prospective students in and outside the classroom.

### Linda M. Wills

Ph.D., Massachusetts Institute of Technology  
*Computer engineering*

### Anthony J. Yezzi, Jr.

Ph.D., University of Minnesota  
*Bioengineering; computer engineering; systems and controls*

### G. Tong Zhou

Ph.D., University of Virginia  
*Bioengineering; digital signal processing*

## ASSISTANT PROFESSORS

### David V. Anderson

Ph.D., Georgia Institute of Technology  
*Computer engineering; digital signal processing*  
2005 PECASE Award - see story on page 16

### Farrokh Ayazi

Co-Director, Center for MEMS and Microsystems Technologies  
Ph.D., University of Michigan at Ann Arbor  
*Electronic design and applications; microsystems*

### Jeffrey A. Davis

Ph.D., Georgia Institute of Technology  
*Computer engineering*  
Georgia Tech Class of 1940 W. Howard Ector Outstanding Teacher Award for his extraordinary efforts in teaching, inspiration transmitted to students, direct impact and involvement with students, and intellectual integrity and scholarship.

### W. Alan Doolittle

Ph.D., Georgia Institute of Technology  
*Microsystems*  
Lockheed Martin Aeronautics Company Dean's Award for Teaching Excellence chosen by Georgia Tech's College of Engineering Dean's Office.

### Gregory D. Durgin

Ph.D., Virginia Polytechnic Institute and State University  
*Electromagnetics*  
Women in Engineering Excellence Teaching Faculty Award - decided by a vote among women engineering students recognizing excellence in teaching, caring, and motivational attitude toward students.

### Magnus Egerstedt

Ph.D., Royal Institute of Technology, Stockholm, Sweden  
*Computer engineering; systems and controls*

### Faramarz Fekri

Ph.D., Georgia Institute of Technology  
*Digital signal processing; telecommunications*

### Aaron D. Lanterman

Demetrius T. Paris Professor  
Ph.D., Washington University in St. Louis  
*Digital signal processing*

### Hsien-Hsin Sean Lee

Ph.D., University of Michigan at Ann Arbor  
*Computer engineering*

### Sung Kyu Lim

Ph.D., University of California at Los Angeles  
*Computer engineering*

### Ioannis (John) Papapolymerou

Ph.D., University of Michigan  
*Electromagnetics; electronic design and applications*

### George F. Riley

Ph.D., Georgia Institute of Technology  
*Computer engineering*

### Gabriel Rincón-Mora

Ph.D., Georgia Institute of Technology  
*Electric power; electronic design and applications*

### Shyh-Chiang Shen

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

**Raghupathy Sivakumar**  
Ph.D., University of Illinois at Urbana-Champaign  
*Telecommunications*

## GEORGIA TECH SAVANNAH

**Randal T. Abler**, Assistant Professor  
Ph.D., Georgia Institute of Technology  
*Computer engineering*  
Gergia Tech Class of 1934 Outstanding  
Innovative Use of Education Technology  
Award

**Ghassan Al-Regib**, Assistant Professor  
Ph.D., Georgia Institute of Technology  
*Digital signal processing; telecommunications*

**Christopher F. Barnes**, Associate Professor  
Ph.D., Brigham Young University  
*Digital signal processing*

**Joel R. Jackson**, Assistant Professor  
Ph.D., Georgia Institute of Technology  
*Digital signal processing*

**Benjamin D.B. Klein**, Assistant Professor  
Ph.D., University of Illinois at Urbana-Champaign  
*Optics and photonics*

**Elliot Moore, III**, Assistant Professor  
Ph.D., Georgia Institute of Technology  
*Digital signal processing*

**Ashraf Saad**, Associate Professor  
Ph.D., Vanderbilt University  
*Computer engineering*

**Feodor Vainstein**, Professor  
Ph.D., Boston University  
*Computer engineering*

**P. Douglas Yoder**, Associate Professor  
Ph.D., University of Illinois at Urbana-Champaign  
*Microsystems*

**Rahman Zaghloul**, Professor  
Ph.D., University of Nebraska at Lincoln  
*Computer engineering; optics and photonics*

## PROFESSORS EMERITI AND LENGTH OF SERVICE

<b>Cecil O. Alford</b>	1968-98
<b>Phillip E. Allen</b>	1984-2005
<b>Henry C. Bourne</b>	1982-92
<b>Aubrey Bush</b>	1965-92 (Employed with the Georgia Centers for Advanced Telecommunications Technology)
<b>W. Russell Callen, Jr.</b>	1970-2005 (Part-time employment with ECE)
<b>J. Alvin Connelly</b>	1968-2001 (Part-time employment with ECE)
<b>Robert K. Feeney</b>	1970-2004 (Part-time employment with ECE)
<b>Joseph L. Hammond</b>	1955-84 (Employed with Clemson University)
<b>David R. Hertling</b>	1978-2004 (Part-time employment with ECE)

<b>Richard J. Higgins</b>	1987-99
<b>John W. Hooper</b>	1957-88
<b>Edward B. Joy</b>	1970-98
<b>Edward W. Kamen</b>	1971-80, 1991-2002
<b>Richard P. Kenan</b>	1986-99
<b>Mohamed F. Moad</b>	1963-2001 (Part-time employment with ECE)
<b>Dale C. Ray</b>	1966-99
<b>George P. Rodrigue</b>	1968-96
<b>William E. Sayle</b>	1970-2003 (Part-time employment with ECE and GTL)
<b>Ronald W. Schafer</b>	1974-2004 (Employed with Hewlett-Packard)
<b>Jay H. Schlag</b>	1967-2004 (Part-time employment with ECE)
<b>Kendall L. Su</b>	1954-94
<b>Roger P. Webb</b>	1963-2004 (Part-time employment with the Georgia Tech Office of the Provost and Vice President for Academic Affairs)

## JOINT FACULTY APPOINTMENTS

**Gisele Bennett**, Senior Research Engineer,  
Georgia Tech Research Institute

**James Foley**, Professor and Stephen Fleming  
Chair in Telecommunications, College of  
Computing

**Levent Degertekin**, Assistant Professor, George  
W. Woodruff School of Mechanical Engineering

**Yogendra Joshi**, Professor, George W. Woodruff  
School of Mechanical Engineering

## ADJUNCT AND PART-TIME APPOINTMENTS

<b>Emmanuel Anemogiannis</b> , Nortel Networks
<b>Daniel J. Blumenthal</b> , University of California at Santa Barbara
<b>David E. Bockelman</b> , Free Electron Technology
<b>Bertrand Boussert</b> , Georgia Tech Lorraine
<b>Catherine Brechignac</b> , Centre National De La Recherche Scientifique
<b>Martin A. Brooke</b> , Duke University
<b>Marijn Brummer</b> , Emory University
<b>Brian Butka</b> , Integrated Device Technology
<b>Donald D. Davis</b> , Antec Corporation
<b>Richard DeMillo</b> , Dean, College of Computing
<b>Jim D. Echard</b> , Georgia Tech Research Institute
<b>Robert Eisner</b> , Crawford Long Hospital of Emory University
<b>Irfan Essa</b> , College of Computing
<b>Gary G. Gimmestad</b> , Georgia Tech Research Institute

**Jean-Pierre Goedgebuer**, Centre National De  
La Recherche Scientifique

**Mathieu Hans**, Hewlett-Packard Company

**Nile F. Hartman**, Georgia Tech Research Institute  
(Retired)

**E. Jefferson Holder**, Georgia Tech Research  
Institute

**Michele L. Jamrozik**, Georgia Tech Lorraine

**Nan Marie Jokerst**, Duke University

**Lance Kaplan**, Clark Atlanta University

**Fred Kitson**, Hewlett-Packard

**Laurent Larger**, Georgia Tech Lorraine

**Bob Lee**, Wallace H. Coulter Department of  
Biomedical Engineering at Georgia Tech/Emory  
University

**Y.-L. Li**, Intel Corporation

**John O. Limb**, Broadcom

**Robert L. Lingle**, Georgia Tech

**Kenneth M. Mackenzie**, College of Computing

**Peter Manolios**, College of Computing

**John H. Matthews**, John H. Matthews and  
Associates, Inc.

**Bill McKinnon**, Georgia Tech Research Institute

**Robert McNally**, NuTek BioMedical

**Jerome Meisel**, Georgia Tech

**William L. Melvin**, Georgia Tech Research  
Institute

**Stephen C. Mettler**, Lucent Technologies

**Joseph W. Monaco**, Line Imaging Systems

**Romain Murenzi**, Clark Atlanta University

**William R. Owens**, Georgia Tech Research  
Institute

**Umakishore Ramachandran**, College of  
Computing

**Mark A. Richards**, Georgia Tech Research  
Institute

**Craig Richardson**, ASPI Digital

**Tariq Samad**, Honeywell

**Karsten Schwan**, College of Computing

**Robert E. Schwerzel**, Georgia Tech Research  
Institute

**Oskar Skrinjar**, 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**, Polycom, Inc.

**May Wang**, Wallace H. Coulter Department of  
Biomedical Engineering at Georgia Tech/Emory  
University

**Stephen B. Wicker**, Cornell University

**Zhiping (James) Zhou**, Georgia Tech  
Microelectronics Research Center

# Professional Education, Conferences, and Courses

During 2004-05, both active and retired ECE faculty members offered and taught 27 courses through the Georgia Tech Professional Education 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. Five ECE-sponsored conferences and workshops are also included in this list.

## 2004

July 26 - 30	<i>RF and Wireless Principles and Practice</i>	Robert K. Feeney and David R. Hertling
Aug. 2 - 6	<i>CMOS Analog Integrated Circuits</i>	Phillip E. Allen; Atlanta, Ga.
Aug. 23 - 27	<i>Near-Field Antenna Measurements and Microwave Holography</i>	Edward B. Joy; Boulder, Colo.
Sept. 8 - 10	<i>5<sup>th</sup> Topical Meeting on Silicon Monolithic Integrated Circuits in RF Systems</i>	John Cressler and John Papapolymerou
Sept. 8 - Oct. 25	<i>Fundamentals of Engineering</i>	W. Russell Callen, Jr.
Sept. 13 - 17	<i>RF and Wireless Engineering</i>	Robert K. Feeney and David R. Hertling
Sept. 21 - 23	<i>Power Distribution System Grounding and Transients</i>	A.P. Sakis Meliopoulos and George Cokkinides
Sept. 9 - Jan. 10, 2005	<i>DSP for Practicing Engineers – Online Course</i>	Doug Williams
Oct. 4 - 7	<i>Fundamentals of Synthetic Aperture Radar Signal Processing</i>	Mark Richards
Oct. 19 - 22	<i>Power System Relaying: Theory and Application</i>	A.P. Sakis Meliopoulos and George Cokkinides
Nov. 10 - 11	<i>5<sup>th</sup> Georgia Tech Conference on Nanoscience and Nanotechnology</i>	Z.L. Wang
Nov. 17 - 19	<i>Modern Energy Management Systems</i>	A.P. Sakis Meliopoulos
Nov. 16 - 19	<i>Fault Diagnostics/Prognostics for Equipment Reliability and Health Maintenance</i>	George Vachtsevanos
Nov. 29 - Dec. 3	<i>Far-Field, Anechoic Chamber, Compact, and Near-Field Antenna Measurements</i>	Edward B. Joy
Dec. 7 - 10	<i>MEMS Boot Camp</i>	Bruno Frazier
Dec. 13 - 15	<i>Emerging MEMS Fabrication Technologies</i>	Bruno Frazier

## 2005

Jan. 22 - March 12	<i>Electrical Engineering: Preparation for the P.E. Exam</i>	W. Russell Callen, Jr. and William E. Sayle
Jan. 24 - 28	<i>Fundamentals of Radar Signal Processing</i>	Mark Richards
Feb. 14 - July 8	<i>DSP for Practicing Engineers – Online Course</i>	Doug Williams
Feb. 7 - Mar. 30	<i>Fundamentals of Engineering</i>	W. Russell Callen, Jr.
March 21 - 23	<i>Ubiquitous Broadband Access Using Wi-MAX</i>	Benny Bing
March 22 - 23	<i>2<sup>nd</sup> International Workshop on Nano and Bio-Electronics Packaging</i>	Leyla S. Conrad
March 22 - 25	<i>Integrated Grounding System Design and Testing</i>	A.P. Sakis Meliopoulos and George Cokkinides
March 28 - 30	<i>Wireless Local Area Networks</i>	Benny Bing
April 4 - Aug. 1	<i>DSP for Practicing Engineers – Online Course</i>	Doug Williams
April 25 - 26	<i>Fault and Disturbance Analysis Conference</i>	A.P. Sakis Meliopoulos
April 25 - 28	<i>MEMS Boot Camp</i>	Bruno Frazier
April 25 - 29	<i>RF and Wireless Principles and Practice</i>	Robert K. Feeney and David R. Hertling
April 25 - 29	<i>Antenna Engineering</i>	Edward B. Joy, Waymond R. Scott, Jr., and Glenn S. Smith
April 27 - 29	<i>59<sup>th</sup> Annual Protective Relaying Conference</i>	A.P. Sakis Meliopoulos
May 16 - 18	<i>Grounding, Harmonics, and Electromagnetic Influence Design Practices</i>	A.P. Sakis Meliopoulos and George Cokkinides
May 23 - 26	<i>Fault Diagnostics/Prognostics for Equipment Reliability and Health Maintenance</i>	George Vachtsevanos



# Academic, Research, and Administrative Personnel

Two hundred thirty-two employees holding academic professional titles, research faculty/personnel titles, and administrative staff titles were employed in ECE during 2004-05. As of June 30, 2005, ECE employed 193 administrative, research, and academic professionals.

## ACADEMIC PROFESSIONALS

Jill Auerbach <i>Academic Professional</i>	Ali Asghar <i>Research Engineer I</i>	Ravi Doraswami <i>Research Engineer II</i>	Admela Jukan <i>Research Engineer II</i>	Ramzy Obaid <i>Postdoctoral Fellow</i>
Catherine Bass <i>Instructor</i>	Amir Betser <i>Senior Research Engineer</i>	Adriane Swalm Durey <i>Postdoctoral Fellow</i>	Kang-Wook Kim <i>Postdoctoral Fellow</i>	Ming Pan <i>Postdoctoral Fellow</i>
Christina Bourgeois <i>Lecturer</i>	Abdul Beyah <i>Research Engineer II</i>	Abashifreke Ebonig <i>Senior Research Engineer</i>	Seong-Soo Kim <i>Postdoctoral Fellow</i>	Hyun Min Park <i>Postdoctoral Fellow</i>
Leyla Sutcu Conrad <i>Senior Academic Professional</i>	Swapan K. Bhattacharya <i>Senior Research Scientist</i>	Arif Ege Engin <i>Postdoctoral Fellow</i>	Sungwon Kim <i>Postdoctoral Fellow</i>	Jin Woo Park <i>Postdoctoral Fellow</i>
Michael D. Furman <i>Academic Professional</i>	Benny Bing <i>Research Engineer II</i>	Barry N. Fairley <i>Research Coordinator I</i>	Tong-Ho Kim <i>Postdoctoral Fellow</i>	Jung Kwan Park <i>Postdoctoral Fellow</i>
Warren M. Lanier <i>Academic Professional</i>	Edgar Brown <i>Research Engineer I</i>	Babak Firoozbakhsh <i>Research Engineer I</i>	Yeong Kim <i>Research Engineer II</i>	Thomas J. Parker <i>Research Technologist II</i>
Michael Laughter <i>Lecturer</i>	Nathan Bushyager <i>Postdoctoral Fellow</i>	Hiram Firpi <i>Postdoctoral Fellow</i>	Frank C. Lambert <i>Senior Research Engineer</i>	Shashikant G. Patel <i>Senior Research Engineer</i>
François J. Malassenet <i>Directeur of Georgia Tech Lorraine/Academic Professional</i>	Dale E. Callaway <i>Research Coordinator II</i>	Canek Fuentes-Hernandez <i>Postdoctoral Fellow</i>	Baik-Woo Lee <i>Postdoctoral Fellow</i>	Boyd M. Pettitt <i>Research Coordinator II</i>
Christopher McGahey <i>Academic Professional</i>	Giorgio Casinovi <i>Senior Research Engineer</i>	Edward Gebara <i>Research Engineer II</i>	Chang Ho Lee <i>Research Engineer II</i>	Stephane Pinel <i>Research Engineer II</i>
Gail O. Palmer <i>Lecturer</i>	Volkan Cevher <i>Postdoctoral Fellow</i>	Sergei Goupalov <i>Postdoctoral Fellow</i>	Jongsoo Lee <i>Postdoctoral Fellow</i>	Mark A. Richards <i>Principal Research Engineer</i>
Kathleen Robichaud <i>Senior Academic Professional</i>	Sudipto Chakraborty <i>Research Engineer II</i>	Mason Graff <i>Research Scientist I</i>	Matthew Lee <i>Postdoctoral Fellow</i>	Brian Rounsaville <i>Research Scientist I</i>
W. Whitfield Smith <i>Senior Academic Professional</i>	Thomas C. Champion <i>Research Engineer I</i>	Daniel Guidotti <i>Senior Research Scientist</i>	Hua Li <i>Postdoctoral Fellow</i>	Jae-Hyun Ryou <i>Research Engineer II</i>
David S. Webb <i>Senior Academic Professional and Assistant to the Chair for Computer Support</i>	Yi-Jan Chen <i>Research Engineer II</i>	Jeongseok Ha <i>Postdoctoral Fellow</i>	Peng Li <i>Research Scientist II</i>	Caterina Scoglio <i>Research Engineer II</i>
	Uttiya Chowdhury <i>Postdoctoral Fellow</i>	Joshua Haddock <i>Research Scientist I</i>	Ronglin Li <i>Postdoctoral Fellow</i>	Susanta Sengupta <i>Research Engineer I</i>
	Theodore Chung <i>Postdoctoral Fellow</i>	Ki Ho Han <i>Postdoctoral Fellow</i>	Kyutae Lim <i>Research Engineer II</i>	Rahul Singh <i>Research Scientist II</i>
	Larry T. Coffeen <i>Research Engineer II</i>	Zhili Hao <i>Postdoctoral Fellow</i>	Fuhan Liu <i>Research Engineer I</i>	Samuel F. Smith <i>Research Scientist I</i>

## RESEARCH FACULTY/ PERSONNEL

Robin Abothu <i>Research Scientist II</i>	George Cokkinides <i>Visiting Professor</i>	Richard A. Hartlein <i>Senior Research Engineer</i>	Pulugurtha Markondela-Raj <i>Research Engineer II</i>	June O. Song <i>Postdoctoral Fellow</i>
Bilge Akgul <i>Research Engineer II</i>	Didier Contis <i>Research Engineer II</i>	Lonnie D. Harvel <i>Senior Research Scientist</i>	Thomas McKoon <i>Research Coordinator II</i>	Paul L. Springer <i>Senior Research Engineer</i>
Gnana Prakash Akkanagowda Patel <i>Postdoctoral Fellow</i>	Richard Copeland <i>Research Engineer II</i>	David W. Harwell <i>Research Coordinator I</i>	Janeen McReynolds <i>Research Engineer II</i>	Daniela Staiculescu <i>Research Engineer II</i>
Mahmoud Fuad Almassri <i>Postdoctoral Fellow</i>	Christophe Courcimault <i>Research Engineer I</i>	Walter Henderson <i>Research Scientist I</i>	Bao Mi <i>Postdoctoral Fellow</i>	Fred T. Stanley <i>Research Coordinator I</i>
Jorge Altamirano <i>Research Technician II</i>	Florent Cros <i>Research Engineer I</i>	Eliezer Herschkovits <i>Postdoctoral Fellow</i>	Oleg Michailovich <i>Research Engineer II</i>	Harry T. Sullivan <i>Research Scientist I</i>
Timothy Andrews <i>Research Engineer I</i>	Lorand Csiszar <i>Research Technologist</i>	Raymond C. Hill <i>Research Technologist</i>	Gon Namkoong <i>Postdoctoral Fellow</i>	Venkatesh Sundaram <i>Research Engineer II</i>
Caryn Arrowood <i>Research Engineer II</i>	Sidharth Dalmia <i>Research Engineer II</i>	Jiandong Huang <i>Postdoctoral Fellow</i>	Marc Niethammer <i>Research Scientist II</i>	Dean A. Sutter <i>Electrical Engineer III</i>
	Benoit Domercq <i>Research Scientist II</i>	Jimmie Jones <i>Research Technician III</i>	Sebastien Nuttinck <i>Research Engineer I</i>	Liang Tang <i>Postdoctoral Fellow</i>



Elaine Hicks (L) and Nancy Sandlin, who earned professional development certificates, are pictured with Roger Webb at the 2005 ECE Awards Program.

Keith Tate  
*Research Equipment Specialist*

Greg Triplett  
*Postdoctoral Fellow*

Jui-Yun Tsai  
*Postdoctoral Fellow*

Hong-Yih Tseng  
*Postdoctoral Fellow*

Ajay Uphadhyaya  
*Research Engineer I*

Vijay Uphadhyaya  
*Research Engineer I*

Lixi Wan  
*Research Engineer II*

Boyd Wiedenman  
*Research Engineer I*

Dean Williams  
*Research Coordinator II*

Namrata Vaswani  
*Research Scientist II*

Patricio Vela  
*Research Scientist II*

George White  
*Senior Research Engineer*

Biqing Wu  
*Research Scientist II*

Shun-Der Wu  
*Postdoctoral Fellow*

Wei Dong Xiang  
*Research Engineer II*

Ki Seok Yang  
*Postdoctoral Fellow*

Siva Yegnanarayanan  
*Postdoctoral Fellow*

Vijay Yelundur  
*Research Engineer II*

Changhyun Yi  
*Research Engineer II*

Seunghyup Yoo  
*Research Scientist I*

Chong K. Yoon  
*Research Engineer II*

Yong Yoon  
*Postdoctoral Fellow*

Jianjun Yu  
*Research Engineer II*

Junsheng Yu  
*Postdoctoral Fellow*

Guang Yuan  
*Postdoctoral Fellow*

Iulica Zana  
*Postdoctoral Fellow*

Tiejun Zhang  
*Postdoctoral Fellow*

Lichu Zhao  
*Postdoctoral Fellow*

#### ADMINISTRATIVE STAFF

Nancy Baines  
*Administrative Assistant II*

Yvonne Bridges  
*Administrative Assistant II*

Debra Balkcom  
*Accountant II*

Harry Beck  
*Director of Operations*

Brian Bennett  
*Mechanical Technician I*

DeeDee Bennett  
*Administrative Assistant I*

Margaret Boehme  
*Administrative Assistant II*

Robert C. Boozer  
*Business Operations Manager*

Louis Boulanger  
*Mechanical Technician III*

Thomas E. Brewer  
*Assistant to the Chair and  
Laboratory Manager II*

Rebecca "Suzy" Briggs  
*Director of ECE Development-  
Alumni*

Lynda D. Buescher  
*Assistant Director for ECE  
Personnel Services*

Kathy B. Cheek  
*Program Coordinator II*

Christopher Connelly  
*Computer Services Specialist II*

Sherrie Cooper  
*Academic Assistant I*

Reed Crouch  
*Program Coordinator II*

Sharon Crouch  
*Assistant Director for ECE  
Accounting*

Tina Crouch  
*Accountant III*

Marion Crowder  
*Senior Information Specialist*

Bethany Davis  
*Program Coordinator II*

Erica Edwards  
*Accountant III*

Angela Elleby  
*Academic Advisor I*

Christy K. Ellis  
*Administrative Assistant II*

Christopher Evans  
*Project Director II*

Cordai Farrar  
*Administrative Assistant II*

Sharon Pugh Fennell  
*Administrative Assistant II*

Candy S. Floyd  
*Administrative Assistant I*

Claudia Ford  
*Academic Advisor II*

Diana L. Fouts  
*Graphics Specialist*

Kay Gilstrap  
*Administrative Manager I*

Gail A. Gourley  
*Project Coordinator II*

LaJauna F. Guillory  
*Program Manager*

Samuel Gunderman  
*Computer Services Specialist  
III*

Pamela F. Halverson  
*Administrative Coordinator*

Lauren Hall  
*Program Manager*

Sandra Hayes  
*Program Manager*

Elaine Hicks  
*Administrative Assistant I*

Fanchette Hillery  
*Computer Services Specialist  
III*

Robert R. House  
*Electronics Specialist*

Zhaoran Huang  
*Postdoctoral Fellow*

Leslie Hudson  
*Accountant II*

Angela Hughes  
*Administrative Manager I*

Peter Hyunh  
*Computer Services Specialist II*

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*

Amber Leshner  
*Administrative Assistant II*

Judith C. Lorier  
*Accounting Manager I*

Ephraim Macharia  
*Administrative Assistant I*

Keith May  
*Computer Services Specialist  
III*

Elizabeth McDonald  
*Systems Support Specialist I*

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*

Julie Peterson  
*Academic Advisor I*

Rachel Melton Ponder  
*Systems Support Specialist II*

Sheree Posey  
*Accountant III*

Mary Render  
*Accountant III*

Allen Robinson  
*Laboratory Manager I*

Carl A. Rust  
*Business Operations Manager*

Gwendolyn Satchel  
*Administrative Assistant II*

Leslie Schlag  
*Administrative Assistant II*

Tammy Scott  
*Administrative Assistant II*

Nancy Sandlin  
*Associate Director of  
Development*

Purnima Sharma  
*Program Coordinator II*

James Steinberg  
*Electronics Technician III*

Florence I. Stoia  
*Program Coordinator II*

Brian Strickland  
*Programmer I*

Christine Sun  
*Programmer III*

Dean C. Sutter  
*Electronics Technician III*

Denise D. Taylor  
*Program Coordinator II*

Marvin Tingler  
*Head-Supply and Materials*

Janet Tippens  
*Information Analyst II*

Michael Toole  
*Electronics Technician II*

Jacqueline Trappier  
*Administrative Supervisor II*

Alvis Turner  
*Assistant to the Director for  
NEETRAC Operations*

Richard Turner  
*Electronics Technician II*

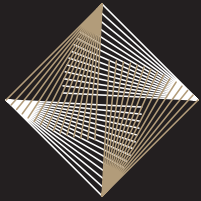
Todd E. Whitehurst  
*Systems Support Specialist III*

Rochelle Y. Williams  
*Accountant III*

Suzzette Willingham  
*Program Coordinator I*

Angela Yvonne  
*Administrative Assistant II*

Carla Zachery  
*Administrative Manager I*



# Research Highlights

## Validation of PBITS Could Save Power, Increase Speed of Computing Devices

For millions of users of computer devices requiring frequent recharging such as cell phones and MP3 players, new technology, developed by ECE researchers, could mean no longer being tethered to their chargers. Krishna V. Palem, a computer engineering professor and director of the Center for Research on Embedded Systems and Technology, and his team confirmed his earlier probabilistic bits, or PBITS, discovery from Spring 2004 by producing a device based on this cutting-edge new approach to making computer chips significantly more energy efficient.

The validation of PBITS is most significant in the area of reduced power consumption and increased processing speeds, resulting in computer devices that run faster and use energy more efficiently. Dr. Palem's PBITS model is now backed by measurements of an actual probabilistic CMOS device, known as PCMOs, that takes advantage of noise at the quarter-micron level to realize the probabilistic behavior resulting in great noise and energy savings—increasingly important factors as semiconductors approach the nanoscale. <http://www.gatech.edu/news-room/release.php?id=514>

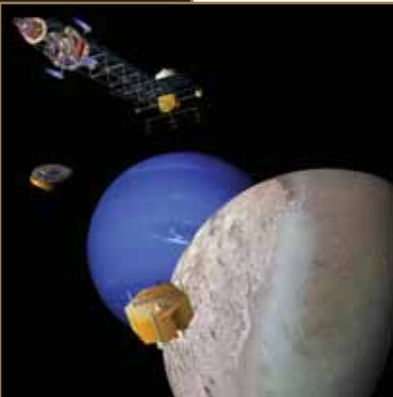


*Krishna Palem (background) and graduate students Pinar Korkmaz and Lakshmi Chakrapani test the probabilistic CMOS test chip.*

## Nuclear Powered Mission May Unlock Solar System Secrets

A 12-month planning study, conducted by a diverse team of experts led by Boeing Satellite Systems and funded by NASA, may begin to reveal some of our solar system's most elusive secrets about the formation of its planets—and recently discovered ones that developed around other stars. ECE Professor Paul G. Steffes is a member of the Neptune team, one of 15 "Vision Mission" studies aimed at developing concepts in the United States' long-term space exploration plans.

The focus of the mission to Neptune and its moons—expected to launch between 2016 and 2018 and arrive around 2035—is to discover some of our solar system's most elusive secrets about the formation of the outer planets and how "adopted children" like Triton, one of Neptune's moons, has affected that development. The mission will employ electrical and optical sensors aboard the orbiter and probes for sensing the nature of Neptune's atmosphere. Mission designers also face challenges in transmitting data from the probes through Neptune's radiowave-absorbing atmosphere. Dr. Steffes' lab at Tech has conducted extensive research and has gained a thorough understanding of how to address this problem. <http://gtresearchnews.gatech.edu/newsrelease/neptune.htm>



*This artist's conception depicts a nuclear-electric-powered orbiter equipped with electrical and optical sensors. The mission would deploy three probes for sensing Neptune's atmosphere and two landers for exploring Triton. Neptune's largest moon (foreground).*

## Sensing Danger: Improving Response to Chemical, Biological Attacks

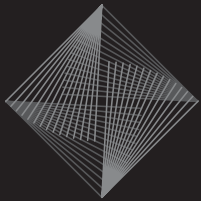
Should terrorists ever use chemical or biological weapons against the U.S., new sensing technologies under development in ECE could help public safety officials respond more rapidly and effectively to the threats. Led by ECE Associate Professor Stephen E. Ralph, researchers in ECE, the School of Chemical and Biomolecular Engineering, and at several other universities are developing integrated micro-optical sensors for chemical and biological agents of national security concern.

The goal is to merge optical sensing technology with highly integrated electrical circuits into a fully integrated sensing system on a silicon chip. The advantages of this system will be better performance, a smaller size that uses less power, full integration, and a low cost of only a few dollars per chip. This proof-of-concept stage of the research—funded by DARPA through the University of Illinois—concluded in December 2004. Additional funding will enable tests of "mock" agents with similar chemical composition to substances that terrorists might use. <http://gtresearchnews.gatech.edu/newsrelease/danger.htm>

*Researchers test an optical chemical sensor with this experimental set-up in the laboratory of Associate Professor of Electrical Engineering Stephen Ralph (right). Associate Professor of Chemical Engineering Cliff Henderson (left) is among those contributing to the project's development of integrated micro-optical sensors for chemical and biological testing.*



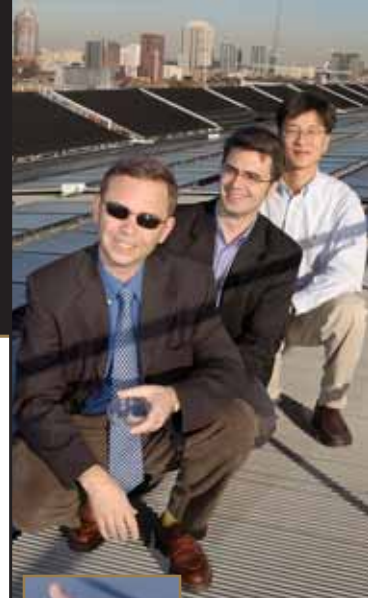




## COPE Researchers Developing Organic Solar Cell

Center for Organic Photonics and Electronics are using pentacene, a polycrystalline, and C60, a form of carbon known as "buckyballs" to create a new breed of solar cells that are lighter, flexible, and less expensive to produce. Made from cheaper, organic materials, the cells' flexibility and feather-weight construction promise to open new markets for solar energy, potentially powering everything from RF identification tags to iPods and laptop computers.

The solar cells are still at least five years away from residential applications, according to ECE Professor Bernard Kippelen, but he estimates that they will be ready to use in smaller devices, such as RFID tags, used by some retailers to control inventory and in sensor networks, within two years. To capitalize on the commercial aspect of this research, Dr. Kippelen and his colleagues in COPE have started LumoFlex, a spin-off company based at Tech. <http://www.gatech.edu/news-room/release.php?id=497>



Bernard Kippelen, Benoit Domercq, and Seunghyup Yoo (pictured front to back) show their organic solar cell in front of an array of silicon solar cells on the roof of Tech's Campus Recreation Center. Inset-The flexibility of organic solar cells will allow them to power a wide variety of products.

## GTMax Test Flight Successful, Moves toward Military Use

Unmanned aerial vehicles are one step closer to someday matching—and possibly surpassing—their human-piloted counterparts, thanks to the successful test flight of GTMax, sponsored by DARPA and the U.S. Air Force Research Laboratory. Based on this UAV success, Georgia Tech has now been awarded funding for two follow-on programs for multiple UAVs in an urban warfare environment and for transitioning the technologies developed under the DARPA/Air Force program to military vehicles.

Tech's primary contribution to the overall project was continuing work started by Boeing on the new software enabled control system, an Open Control Platform, which gives the UAV the ability to reconfigure its software systems autonomously in flight. The final test, conducted at the Military Operations Urban Terrain site at Fort Benning, Ga., successfully demonstrated its

capabilities of flight control fault identification and reconfiguration, adaptive control, and agile maneuvering. Georgia Tech's principal investigators on the project were ECE Professor George J. Vachtsevanos and Daniel Schrage and Eric Johnson, professors in the School of Aerospace Engineering. <http://www.gatech.edu/news-room/release.php?id=515>



GTMax, the first rotary wing UAV, is able to learn as it flies, maneuver aggressively, and automatically plan a route through obstacles thanks to its Open Control Platform system.

## Samsung Design Center Established at GEDC

Samsung Electro-Mechanics Company, Ltd. announced the establishment of a Georgia-based design center to develop next-generation radio frequency integrated circuit technology. SEM, a corporation within the Samsung group, is a global leader in semiconductor, telecommunications, digital media, and digital convergence technologies.

The Center, to be housed initially in the Georgia Electronic Design Center on the Georgia Tech campus, will become the company's principal North American research location and will emphasize high-speed RFIC technologies and expertise. Chang-Ho Lee, formerly with GEDC and a 2001 ECE Ph.D. graduate, has been named director of the Samsung Design Center. As the new design center expands over the next few years, the company plans to extend its cooperation with the Institute and Atlanta to include packaging technology. The activity will provide opportunities for students to gain real-world design experience and potential collaborations in cognitive radio and power amplifiers, already strong research areas for ECE and Georgia Tech.

<http://www.gatech.edu/news-room/release.php?id=609>

Officials of Samsung, the State of Georgia, and Georgia Tech officially open the new Samsung design center at the Georgia Electronic Design Center in Atlanta. Pictured (l-r) are Craig Lesser, commissioner of the Georgia Department of Economic Development; Ho-Moon Kang, CEO of Samsung; Jean-Lou Chameau, provost of Georgia Tech; Byeong-Cheon Koh, chief technical officer of Samsung; and Mike Cassidy, president of the Georgia Research Alliance.







(l-r) Mary Ann Ingram and researchers Vikram Anreddy, Billy Barott, and Nathan Jones (with Mr. Barott in the far right photo) collect and analyze data from an antenna array located on the roof of the GCATT Building.

## Adaptive Arrays Improve Access to NASA Satellite Data

A new adaptive array system being studied by NASA and Georgia Tech researchers could dramatically decrease the cost of building and maintaining ground stations, thus enabling cost-effective construction of many more ground stations and revolutionizing the way that the space agency obtains data from its Earth observing satellites. Ultimately, this system could make information from NASA's Earth-observing satellites more widely and rapidly available. The "off-the-shelf" technology—developed by ECE Professor Mary Ann Ingram and her research group—has already demonstrated that it can successfully receive one satellite telemetry frequency.

The adaptive arrays are built from inexpensive components, including common PVC piping and aluminum foil. Signals from the four antennas are analyzed using a processing technique that learns to improve its performance by constructively combining scattered and reflected versions of the signal and by suppressing noise and interference. That eliminates the need for costly front-end hardware and precise aiming of the antenna arrays, and allows flexibility in the location of the ground station. In tests conducted at the Tech campus, the researchers were able to downlink EO-1 information in the S-band, a frequency used for transmissions at low data rates.

<http://gtresearchnews.gatech.edu/newsrelease/adaptive-array.htm>

## CardioMEMS Creates Devices to Monitor Heart Patients

A graduate company of Georgia Tech's Advanced Technology Development Center, CardioMEMS is pioneering a new breed of testing devices to monitor heart patients by combining wireless communications technology with MEMS fabrication. Launched in 2001, CardioMEMS was co-founded by Jay Yadav, a cardiologist and director at the Cleveland Clinic Foundation, and Mark G. Allen, Joseph M. Pettit Professor in Microelectronics and co-director of the Center for MEMS and Microsystems Technologies in ECE.

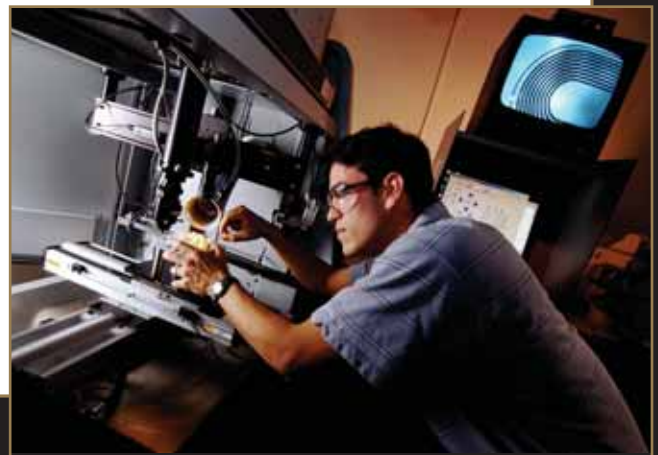
In June 2004, CardioMEMS began clinical trials in the U.S. for its EndoSensor™, which measures blood pressure in people who have abdominal aortic aneurysms. Doctors can treat the aneurysm with a stent graft, but it can fail, resulting in blood leakage into the aneurysm, which can cause it to burst. CardioMEMS' biocompatible sensor, which is implanted with the stent, provides more effective monitoring than CT scans, plus it is cheaper and more convenient.

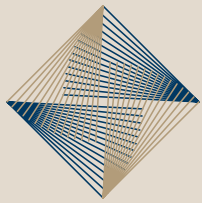
CardioMEMS conducted its first U.S. implants at the Cleveland Clinic in July 2004, and within a year, more than 100 patients had received sensor implants. Clinical trial data has been submitted to the U.S. Food and Drug Administration, with permission to commercialize the EndoSensor anticipated by the end of 2005.

<http://gtresearchnews.gatech.edu/newsrelease/cardiomems.htm>

(top) Close-up image of a CardioMEMS pressure sensor. The device, implanted along with a stent graft to wirelessly measure pressure, is currently undergoing clinical trials.

CardioMEMS engineer Michael Fonseca uses a laser to separate pressure sensors in the company's clean room facility in the ATDC Biosciences Center located at Georgia Tech's Environmental Science and Technology Building.





## External Affairs

The ECE Office of External Affairs—led by Suzy Briggs and Nancy J. Sandlin—cultivates and coordinates the School's development and fundraising efforts with industry, alumni, and other interested individuals and organizations. ECE External Affairs also manages the School's Industrial Partnership Program, and it supports and coordinates all ECE consortia organized under the IPP umbrella. In addition, this office also plans twice-yearly ECE Advisory Board meetings and the annual James R. Carreker Distinguished Lecture, and it also works in cooperation with the College of Engineering and the Institute's Central Development Office to produce events of interest to both alumni and current and prospective donors.

### Eight ECE Alumni Honored at College of Engineering Alumni Awards

The College of Engineering held its annual alumni awards induction ceremony in November 2004 at the Grand-Hyatt Atlanta. Eight 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 CoE 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 14 inductees, three were ECE alumni.

##### **E. Calvin Johnson**

B.E.E. '47  
Vice President for Engineering  
UBC, Inc.  
Tampa, Fla.

##### **M. David Prince**

B.E.E. '46, M.S.E.E. '49  
Senior Staff Specialist (Retired)  
Lockheed Aeronautical Systems Company  
Atlanta, Ga.

##### **Roger P. Webb**

Ph.D.E.E. '64  
Steve W. Chaddick School Chair  
School of Electrical and Computer Engineering  
Georgia Institute of Technology  
Atlanta, Ga.

#### 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 eight inductees, one was an ECE alumnus.

##### **Alan F. Krauss**

M.S.E.E. '95, Ph.D.E.E. '98  
Principal Engineer  
Schneider Electric  
Raleigh, N.C.



(l-r) Randy I. Walker, Ronald S. Slaymaker, E. Calvin Johnson, Roger P. Webb, Richard J. Coddling, Stefan V. Stein, and past YEA recipient Robert Gemmell.

#### 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 18 total inductees, four were ECE alumni.

##### **Richard J. Coddling**

B.E.E. '66  
Partner  
Akin Gump Strauss Hauer and Feld,  
LLP  
Los Angeles, Calif.

##### **Ronald S. Slaymaker**

B.E.E. '82  
Vice President, Investor Relations  
Texas Instruments  
Dallas, Tex.

##### **Stefan V. Stein**

B.E.E. '77  
Partner, Intellectual Property Group  
Holland and Knight, LLP  
Tampa, Fla.

##### **Randy I. Walker**

B.E.E. '81, M.S.E.E. '92  
General Manager  
AP Business Transformation  
IBM  
Shanghai, China

# Georgia Tech Foundation Grants and Gifts

During FY 2005, corporations, non-profit organizations, and individual donors contributed \$12,331,549 to ECE through the Georgia Tech Foundation. The first table shows the amount of funds designated for specific categories. The second table alphabetically lists the various companies, constituencies, and individuals that donated funds to ECE.

## COMPANIES

ABB, Ltd.	Framatome ANP, Inc.
Agilent Technologies, Inc.	Freescall Semiconductor, Inc.
Altera Corporation	Georgia Power Company
Aluminum Company of America	Harimatec, Inc.
American Electric Power Company, Inc.	Hewlett-Packard Company
Analog Devices Corp.	IBM Corporation
Ansoft Corp.	ICON Interventional Systems, Inc.
ARRIS Group, Inc.	Integrated Device Technology, Inc.
Asahi Chemical Industry Company, Ltd.	Intel Corporation
Asahi Glass America, Inc.	Lancop, Inc.
AT&T Corporation	Lockheed Martin Corporation
Atotech Deutschland GMBH	LSI Logic Corporation
BARCO Display Systems	Matsushita Electric Industrial Company, Ltd.
BellSouth Telecommunications, Inc.	Microsoft Corporation
BP Solar International, LLC	Microwave Bonding Instruments
Broadcom Corporation	Milliken and Company, Inc.
Cermet, Inc.	Mitsubishi Electric Information Technology
Chevron Texaco Corporation	Center America
Ciena Corporation	Motorola, Inc.
Cingular Wireless	National Semiconductor Corporation
Cisco Systems, Inc.	NGK Spark Plug Company
Comcast Cable Corporation	Nippon Telegraph and Telephone
ComEd	Corporation
Consolidated Edison Company of	Northrop Grumman Corporation
New York, Inc.	Nova-Borealis Compounds, LLC
Cooper Power Systems	Oak-Mitsui
Cree Microwave, Inc.	OFS Fitel, LLC
Dell Computer Corporation	Pepco
DoCoMo Communication Labs	Pirrelli Cable Corporation
Dominion Virginia Power	Polaris Wireless, Inc.
Dow Chemical Company	Procter and Gamble Company
Duke Energy Company	Public Service Electric and Gas Company
EMS Technologies, Inc.	Quellan, Inc.
Entergy Services, Inc.	Raytheon Company
Exxon Mobil Corporation	Rohm and Haas Company

Gift Category	Total
Endowment	\$1,335,377.85
Equipment	\$673,413.41
Faculty Support	\$3,397,911.27
Fellowships	\$123,133.28
General Support	\$85,395.56
Memberships	\$6,267,863.20
Scholarships	\$410,465.00
Student Support	\$39,990.00
<b>Grand Total</b>	<b>\$12,331,548.57</b>

RWE SCHOTT Solar  
 SAMEER  
 Samsung SDI Company, Ltd.  
 Schlumberger  
 Schlumberger, Ltd.  
 Semiconductor Research Corporation  
 Sharp Labs of America  
 Siemens AG  
 Siemens Information and Communications  
 Mobile, LLC  
 Sonoscan, Inc.  
 South Carolina Electric and Gas Company  
 Southern California Edison Company  
 Southern Company  
 Southern States, Inc.  
 Southwire Company  
 Taiwan Semiconductor Manufacturing  
 Company, Ltd.  
 Teijin Kasei America, Inc.  
 Tellabs  
 Texas Instruments, Inc.  
 Texas Utilities Company  
 Thomas and Betts Corporation  
 Tyco Electronics Corporation  
 Union Carbide Corporation  
 Xilinx, Inc.

## New Associate Director of Development

Nancy J. Sandlin joined ECE in July 2004 as the new associate director of Development, where she is responsible for the School's industrial relations and fundraising activities. She replaced Harry L. Vann who was named director of Georgia Tech's Office of Corporate Relations. A Tech alumna (BMGT '92), Ms. Sandlin has worked in corporate affairs and external relations for over 12 years.



## PROFESSIONAL, RESEARCH, AND ACADEMIC ORGANIZATIONS

American Society for Engineering  
 Education  
 Information Storage Industry Consortium  
 Institute of Microelectronics  
 Purdue University  
 SRC Education Alliance  
 Transducers Research Foundation



## FOUNDATIONS/NON-PROFIT ORGANIZATIONS

Community Foundation for Greater Atlanta  
John and Mary Franklin Foundation, Inc.  
GE Foundation  
General Motors Foundation  
Harris Foundation  
Intel Foundation  
Lockheed Martin Corporation Foundation  
Motorola Foundation  
National Instruments Foundation  
Netherlands-America Community Trust  
Otto and Jenny Krauss Charitable Foundation Trust  
Square D Foundation

## INDIVIDUALS

Han A.M. Al-Ansary  
C. Dean Alford  
Warren Batts  
Harry L. Beck  
Stanley Belyeu  
Henry C. Bourne

R.N. Boyd  
Suzy Briggs  
Michael J. Buckler  
Lynda D. Buescher  
Robert J. Butera  
Michael A. Coleman  
Thomas R. Collins  
J. Alvin Connelly  
Leyla S. Conrad  
Sharon K. Crouch  
Robert G. Dawson  
Howard G. Dean  
R. Thomas Dyal  
H. Allen Ecker  
Thomas A. Edwards  
Aldo A. Ferri  
Thomas K. Gaylord  
Terry Hall  
Leonard J. Haynes  
E. Calvin Johnson  
Jan Kolnik  
Alan F. Krauss  
Thomas R. Lee  
Judith Lorier  
Kenneth E. MacKenzie  
Joseph E. Mayes  
Lea A. McLees

Norma J. McLees  
F.B. "Duke" Mewborn  
Douglas W. Olsen  
Elsie E. Paris  
John B. Peatman  
Claude A. Petty  
John E. Pippin  
Leonard E. Prince  
Hans B. Püttgen  
Thomas J. Quigley  
Marvin O. Richter  
David W. Salter  
Nancy J. Sandlin  
William E. Sayle  
Paul Sheehy  
Stefan V. Stein  
C. Meade Sutterfield  
Howard A. Thrailkill  
Joe L. Trantham  
Kristin Turgeon  
Harry L. Vann  
Randy I. Walker  
Phyllis F. Warrillow  
Roger P. Webb  
The Honorable Daniel A. Webster  
Luis M. Zuniga, Jr.

## Siemens Partners with GEDC to Create Next Generation of Wireless Products

Furthering its commitment to providing advanced telecommunications technology to the U.S. market, Siemens Communications, Inc. joined forces with GEDC to create the next generation of wireless (3G) products and applications. Siemens is providing financial support, which will enhance its ability to create next generation voice, wireless data, and IP-based multimedia subsystem applications for its U.S. customers.

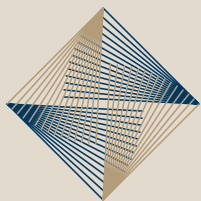
In addition to a monetary contribution, Siemens is donating a variety of its 3G wireless network infrastructure equipment and technology, including Siemens IMS platforms and 3G network components, to a newly constructed state-of-the-art testbed in GEDC. The facility, equipped with the latest 3G/UMTS technology from Siemens, will focus on developing state-of-the-art IMS applications for Siemens and U.S. carriers. Both Georgia Tech and Siemens Communications personnel will staff the facility.

Next generation applications range from high-speed access to the Internet and wireless video and audio for business customers, as well as a wide variety of services such as high-resolution digital image transfer, full-motion video, location and presence-based services, fixed mobile convergence, voice over IP, and advanced interactive gaming.



(l-r) Joy Laskar, GEDC Director; Detlev Otto, Siemens SAG, head of Development for Next Generation 3G Radio Access Networks; Robert (Bob) Capps, Siemens VP Cingular Account; Mike Cassidy, president of the Georgia Research Alliance





## 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. Led by C. Meade Sutterfield, the Board had 21 members in FY 05.

The School of ECE added three new advisory board members—Mel Coker (BEE '87), Sherra Kerns, and Theresa Maldonado (BEE '81, MSEE '82, and PhDEE '90)—in fall 2004, all who represent companies and universities that have strong corporate and academic ties with ECE and Georgia Tech. Ms. Coker is the executive director of BellSouth's Corporate Strategy and Planning. Prior to her current position, she was the general manager of BellSouth Mobility for Middle Georgia and worked in regional operations for BellSouth's start-up video business. In 2000, Ms. Coker was named Georgia Tech's Outstanding Young Alumna and was inducted into the CoE's Council of Outstanding Young Engineering Alumni. Dr. Kerns is the vice president for Innovation and Research at Olin College and is also the F.W. Olin Professor of Electrical and Computer Engineering. A Fellow of the IEEE, Dr. Kerns is the recipient of the IEEE Millennium Medal and the Harriett B. Rigas Award, given by the IEEE Education Society. Dr. Maldonado is currently the associate dean for the Dwight Look College of Engineering at Texas A&M University, the associate director of the Texas Engineering Experiment Station, and a professor in the Department of Electrical Engineering. She was inducted into the inaugural group of the Council of Outstanding Young Engineering Alumni in 1995.

The 2004-05 advisory board members and their affiliations are listed below.

**C. Dean Alford**

Allied Utility Network  
Conyers, Ga.

**Antonio R. Alvarez**

Cypress Semiconductor (Retired)  
San Jose, Calif.

**Michael B. Bartlett**

Dallas, Tex.

**Michael Buckler**

Lucent Technologies  
Cary, N.C.

**Steve W. Chaddick**

CIENA Corporation (Retired)  
Alpharetta, Ga.

**Mel Coker**

BellSouth  
Atlanta, Ga.

**Michael A. Coleman**

Winter Garden, Fla.

**H. Allen Ecker**

Scientific-Atlanta, Inc.  
Lawrenceville, Ga.

**Kelvin C. Hawkins, Sr.**

IBM  
Research Triangle Park, N.C.

**Leonard Haynes**

The Southern Company  
Atlanta, Ga.

**Sherra E. Kerns**

Olin College  
Needham, Mass.

**Fred Kitson**

Motorola  
Schaumburg, Ill.

**Scott Madigan**

Tphone.us  
Cumming, Ga.

**Jim Maran**

Gwinnett County Chamber of  
Commerce  
Duluth, Ga.

**Michael R. McQuade**

DuPont Company  
Wilmington, Del.

**Theresa Maldonado**

Texas A&M University  
College Station, Tex.

**Joe Neel**

Smith Barney  
Birmingham, Ala.

**E. Jock Ochiltree**

St. Augustine, Fla.

**Randall E. Poliner**

Antares Capital Corporation  
Melbourne, Fla.

### ECE Advisory Board Endows Annual Awards Program in Roger Webb's Honor



At the fourth annual School of Electrical and Computer Engineering Awards Program, held on April 28, 2005, C. Meade Sutterfield, chair of the ECE Advisory Board, announced that the Board is endowing the ECE Awards Program in honor of Roger P. Webb, who retired as the Steve W. Chaddick School Chair in December 2004, for his vast contributions to ECE and Georgia Tech spanning more than 40 years.

Starting in 2006, the event will be known as the Roger P. Webb Awards Program in the School of Electrical and Computer Engineering. Mr. Sutterfield, who has hosted the event for the last two years, and his fellow advisory board members consulted with Dr. Webb, and all agreed that this annual awards program—which honors outstanding ECE students, faculty, and staff—should continue in future years. This tribute honors Dr. Webb's leadership which has enabled the School to achieve its phenomenal success.

**Thomas J. Quigley**

Broadcom Corporation  
Franklin, N.C.

**Ronald S. Slaymaker**

Texas Instruments, Inc.  
Dallas, Tex.

**C. Meade Sutterfield**

Chair, ECE Advisory Board  
SSPCS Corporation  
Atlanta, Ga.

## ECE STATE BUDGET AND EXPENDITURES

### State Budget (Initial FY 05 allocation - \$16,935,000)

Salaries and Fringe	\$21,504,376
Travel	119,951
Materials and Supplies	1,775,282
Equipment	649,451
<b>Total</b>	<b>\$24,049,060</b>

### Departmental Sales and Service

Salaries and Fringe	\$191,641
Travel	64,242
Materials and Supplies	141,760
Equipment	12,334
<b>Total</b>	<b>\$409,977</b>

### Research Consortium (State Research-GEDC)

Salaries and Fringe	\$1,796,152
Travel	210,084
Materials and Supplies	435,535
Equipment	54,672
<b>Total</b>	<b>\$2,496,443</b>

### Final State Expenditures **\$26,955,480**

### Sponsored Expenditures\*

Salaries and Fringe	\$16,919,053
Travel	1,260,085
Materials and Supplies	10,714,210
Equipment	1,333,139
Other (GTF Direct)	1,475,249
Indirect (O/Head)	9,631,471

### Final Sponsored Expenditures **\$41,333,207**

\*Includes Georgia Tech Foundation

GTRI – Georgia Tech Research Institute

GTS – Georgia Tech Savannah

HKM – Eta Kappa Nu

PRC – Packaging Research Center

SURE – Summer Undergraduate Research in Engineering/Science Program

TSRB – Technology Square Research Building

WECE – Women of Electrical and Computer Engineering

WIE – Women in Engineering

### Companies and Organizations

ASEE – American Society for Engineering Education

ECEDHA – Electrical and Computer Engineering Department Heads Association

FIRST – For Inspiration and Recognition of Science and Technology

GRA – Georgia Research Alliance

HP – Hewlett-Packard

IEEE – Institute of Electrical and Electronics Engineers

KETI – Korean Electronics Technology Initiative

OSA – Optical Society of America

PES – Power Engineering Society (a technical interest society of IEEE)

SEM – Samsung Electro-Mechanics Company, Ltd.

SRC – Semiconductor Research Corporation

### Governmental Agencies and Universities

DARPA – Defense Advanced Research Projects Agency

ERC – Engineering Research Center (National Science Foundation)

FDA – Food and Drug Administration

MIT – Massachusetts Institute of Technology

NASA – National Aeronautics and Space Administration

NSF – National Science Foundation

NTU – Nanyang Technological University

NUS – National University of Singapore

SJTU – Shanghai Jiaotong University

### Technical Abbreviations

BiCMOS – Bipolar Complementary Metal Oxide Semiconductor

CAD – Computer Aided Design

CMOS – Complementary Metal Oxide Semiconductor

CSMA – Carrier Sense Multiple Access

GSI – Gigascale Integration

HBT – Heterojunction Bipolar Transistor

IC – Integrated Circuit

IMS – IP-Based Multimedia Subsystem

LAN – Local Area Network

LET – Linear Energy Transfer

MAC – Medium Access Control

MIMO – Multiple Input Multiple Output

MEMS – Microelectromechanical Systems

OCP – Open Control Platform

OFDM – Orthogonal Frequency Division Multiplex

PCMO – Probabilistic Complementary Metal Oxide Semiconductor

Q – Quality

QoS – Quality of Service

RF – Radio Frequency

RFIC – Radio Frequency Integrated Circuit

RFID – Radio Frequency Identification

SEC – Software enabled control

SIMD – Single Instruction, Multiple Data

SOC or SoC – System-on-a-Chip

SOP or SoP – System-on-a-Package

UAV – Unmanned aerial vehicle

ULSI – Ultra Large Scale Integration

UMTS – Universal Mobile Telecommunications System

VCSEL – Vertical Cavity Surface Emitting Laser

VLSI – Very Large Scale Integration

## GLOSSARY OF ACRONYMS

This list covers the meanings of abbreviations found throughout the 2004-05 Annual Report for the School of Electrical and Computer Engineering.

### Awards

PECASE – Presidential Early Career Award in Science and Engineering

### Georgia Tech/ECE

ATDC – Advanced Technology Development Center

CoC – College of Computing

COPE – Center for Organic Photonics and Electronics

CoE – College of Engineering

CREST – Center for Research on Embedded Systems and Technology

ECE – Electrical and Computer Engineering

FACES – Facilitating Academic Careers in Engineering and Science Program

GCATT – Georgia Centers for Advanced Telecommunications Technology

GEDC – Georgia Electronic Design Center

GTAC – Georgia Tech Analog Consortium

GTREP – Georgia Tech Regional Engineering Program

## *Contact Information*

### **ECE Main Office**

404.894.4641	ECE Main Office Fax
404.894.2902	Steve W. Chaddick School Chair, Gary S. May
404.894.4468	Program Manager/Assistant to the Chair, LaJauna F. Guillory
404.894.4697	Associate Chair for ECE Faculty Development, Andrew F. Peterson
404.894.3128	Associate Chair for ECE Graduate Affairs, Paul G. Steffes
404.894.4740	Associate Chair for ECE Undergraduate Affairs, Douglas B. Williams
404.894.2975	Associate Chair for ECE Academic Operations, Joseph L.A. Hughes
404.894.2927	Associate Chair for ECE External Affairs, Hans B. Püttgen
404.894.9485	Associate Chair for ECE Operations, Jay Schlag
404.894.2946	Undergraduate Affairs
404.894.2983	Graduate Affairs
404.894.4733	Business Operations
404.894.4769	Accounting
404.894.7574	Human Resources
404.894.5210	Director of Development
404.894.4025	Associate Director of Development
404.894.2906	Communications
U.S. mail	School of Electrical and Computer Engineering 777 Atlantic Drive, N.W. Atlanta, GA 30332-0250

*www.ece.gatech.edu*

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