LETTER FROM THE CHAIR

The past academic year (2003-2004) was good, but challenging, for the Woodruff School. Fortunately, the challenging parts were overcome because of the outstanding team that we have in the faculty and staff as well as support from the administration at the Institute. The challenge was associated with a very tight budget due to reductions in our institutional budget and significant reductions in our endowment income. Fortunately, our research funding has some growth. We took a number of steps to meet the budget reduction challenge, including a reduction in the number of summer course offerings, a reduction in the number of new graduate students recruited for the coming year, the deferral of a number of needed facility upgrades, and a reduction in staff. We also deferred the Woodruff Distinguished Lecture for the year. We did, however, host an excellent Gegenheimer Lecture on Innovation from Steve Stice, a professor at the University of Georgia, on Cloning Technologies. The fiscal year that we are currently entering will not be any easier. We had another reduction in our endowment income. Our institutional budget has held relatively steady although there is already word from the State about budget cuts needed during the year. However, we will continue to provide an excellent education for our students and to advance our programs.

During the year, a new Academic Advisor for the Undergraduate Programs joined our team. Kristi Lewis earned her bachelor’s degree in 1994 from the Woodruff School, holds a master’s degree in mechanical engineering from Clemson University, and has ten years of industrial experience. She is a good addition to our staff and will provide good academic and professional advisement to our students. Kristi is a member of the faculty in an Academic Professional position.

This year, we initiated an extensive review of our undergraduate and graduate curricula. We have been on the semester calendar for five years, and it is time to review the programs and implement changes based on our experience. We plan to complete this review and have degree requirement changes in place by the end of the 2005 academic year.

We are constantly working to improve our programs, and it must be well recognized because as we go to press with this publication, the 2004 U.S. News & World Report undergraduate rankings were published and we are ranked 4th in mechanical engineering, tied with the University of California at Berkeley and following Massachusetts Institute of Technology, the University of Michigan, and Stanford University, in that order. Our nuclear and radiological engineering program also made the rankings this year, coming in at 11th. We are very pleased with these recognitions for our programs.

Student enrollment and quality continue to increase. We granted nearly 500 degrees during the past year and have an increasing pipeline of students at the undergraduate and graduate levels. The job market for graduates in both mechanical engineering and nuclear engineering is up. Our students have received excellent job offers and the reported starting salaries are also up. This may account for some of our increased enrollment. We intended to reduce our incoming graduate class for the fall of 2004, but it is only down about two percent. Our incoming undergraduate class is the largest I can recall. At present, we have about 404 freshmen, 366 indicating mechanical engineering as their major and 38 NRE. This is about double the number of mechanical engineering freshmen we have had in the last several years. There are 1491 total undergraduate students in the Woodruff School. Our distance-learning master’s program is also proving very successful. We have 200 students enrolled in the program.

We completed the conversion of our Master of Science in Health Physics (MSHP) to the Master of Science in Medical Physics (MSMP) this past year, and the first class of students was admitted to the MSMP program for fall 2004. The demand is more than we had expected, with a 5:1 ratio of applicants to positions available. This may prove to be a very popular program. Our nuclear engineering enrollments are also up, particularly at the undergraduate level.

The student competition teams continue to do well. The Georgia Tech Motorsports team went to Australia and won first place. Unfortunately, they did not do quite as well in Detroit, having experienced a vehicle problem during the all-important endurance run. The GT Off Road team also did well this year until they went to a competition in Canada, where the truck, trailer, and equipment were stolen from the parking lot of their motel. We are interested in our students getting international experience, but that is not exactly what we had in mind. Fortunately, General Motors stepped forward and provided $40,000 to replace much of the equipment for the team. The FutureTruck team also did well, having converted a stock Ford SUV to a hybrid vehicle with very good fuel economy and better acceleration than the gas powered stock SUV they started with. We continue to have strong representation from our mechanical engineering students in the national student competitions.

We were pleased to announce the appointment of Professor Yogendra Joshi to the McKenney/Shiver Chair in Building Mechanical Systems. Professor Joshi has been with the Woodruff School for the past three years and has developed a strong program in building energy management, particularly in the new field of environmental control for computer server farms so important for the Internet. Tom Barrow, who was named the 2004 Woodruff Distinguished Alumnus, initiated the idea of the Chair in Building Mechanical Systems, made the first contribution, and was a relentless worker at helping us raise the needed funds. Thanks Tom.

With regret, I must announce that during the past year, we lost several members of the Woodruff School family. Professor Robert Fulton died unexpectedly on February 24, 2004. Bob Fulton also was an elected member of the Fulton County Commission and was a very active person, both professionally and in the community. Fulton County named a new branch of the North Fulton County Library System in his honor. Also, Jim Brazell died on December 2, 2003. Many of you may remember that he taught design classes for many years in the 1970s and 1980s, leading our student teams to recognition in several NASA competitions. Finally, Mr. Ralph Pries, who was our Distinguished Alumnus in 2002, also passed away. All three of these people contributed significantly to Woodruff School programs and they will be missed.

In closing, I want to thank all members of the Woodruff School team — students, faculty, staff, contributors — for your assistance in making our education and research programs outstanding.

Ward O. Winer, Ph.D.
Eugene C. Gwaltney, Jr. Chair of the Woodruff School of Mechanical Engineering
Atlanta, September 2004
SPECIAL EVENTS

The Gegenheimer Lecture on Innovation
Dr. Steve Stice, Professor and Georgia Research Alliance Eminent Scholar at the University of Georgia, gave the ninth annual Harold W. Gegenheimer Lecture on Innovation at the end of October 2003. He presented a very interesting lecture titled Cloning Technology at a Crossroad: Raelians or Real Science? He talked about advances and innovations made in cloning, such as the production of safer and cheaper drugs through cloned animals. He said that as is the case with any technological advance, there have been setbacks and we will need to decide whether the potential benefits of cloning outweigh the risks. To listen to Dr. Stice's lecture, go to our home page at www.me.gatech.edu and click on the Gegenheimer Lecture icon.

Dr. Stice's research focuses on developing innovative animal cloning and stem cell technologies. He produced the first cloned rabbit in 1987 and the first cloned transgenic calves in 1988. He holds 14 patents with six pending.

The Spring Banquet
The spring banquet has been an annual event in the Woodruff School for almost twenty years. It is planned and organized by the Woodruff School Student Advisory Committee (WSSAC). The event, which honors graduating seniors and fellowship winners, was attended by about 150 people. There was a buffet dinner, the introduction by Dr. Ward Winer of the Outstanding Alumnus, Tom Barrow, and the Jack M. Zeigler Outstanding Educator, David McDowell.

Faculty awards this year were: best student relations: Bill King; most knowledgeable: Tom Kurfess; best new professor: Sam Graham; best overall professor, Al Ferri; most challenging professor: Marc Smith; most admired professor: David Sanborn; most entertaining professor: Jon Colton; and most helpful staff member: Norma Frank.

The Jack M. Zeigler Outstanding Educator Award
Dr. David McDowell was chosen as the 2004 Jack M. Zeigler (BME 1948) Outstanding Educator in the Woodruff School because of his contributions to education and teaching. Dr. McDowell could not attend the banquet, but he passed along some of his philosophy on education for the assembled students: “My philosophy is simple, but based on experience. Everyone has the seed to be world-class at something. Some realize this, and some don’t. Some believe it and some don’t. Some discover it and some don’t. This is a great mystery of being human. A place like Georgia Tech can liberate those dreams buried in imagination and can offer their transformation to reality. But it is hard work. It is up to the student to identify and pursue their strengths. In this, an educator can play a crucial role.”

Dr. McDowell joined the Woodruff School in 1983 as Assistant Professor. Today, he holds the Carter N. Paden, Jr. Distinguished Chair in Metals Processing, is a Regents’ Professor, and has a joint appointment in the School of Materials Science and Engineering. He completed his undergraduate work at the University of Nebraska and earned his master's and doctoral degrees in mechanical engineering from the University of Illinois. He is a Fellow of the ASME, the recipient of the 1997 Nadai Award, the most prestigious honor bestowed by the Materials Division of the ASME, and the winner of the 2001 Georgia Tech Outstanding Interdisciplinary Activities Award.

Dr. McDowell’s research concerns materials processing, deformation, and damage, with an emphasis on wrought and cast metals and their alloys.

The Distinguished Alumnus Award
Mr. Tom Barrow was honored with the 2004 Woodruff Distinguished Alumnus Award at the Annual Spring Banquet. He described his mechanical engineering education: “My education at Georgia Tech was one of the finest. I developed a work ethic – it took hard work to get here and hard work to stay here. I developed an analytical approach to solving problems and a somewhat skeptical attitude. All of the above gave me confidence and that will give you the attitude that you can lead. A Georgia Tech education is special and will last all your life.”

Mr. Barrow received his bachelor’s degree in mechanical engineering from Georgia Tech in 1947. Upon graduation, he worked for a manufacturer’s representative in Atlanta selling heating and air conditioning accessory equipment. He left to start his own firm in 1955. Since that time, the company has grown to one of the largest of its type, including nine offices in Georgia, Florida, and Tennessee.
Mr. Barrow is a registered professional engineer. He has contributed to the design of new types of equipment and has assisted in the selection of equipment in major construction projects. He has held offices in various professional and civic organizations including: ASHRAE; National Society of Professional Engineers; Atlanta Builders Exchange; Kiwanis Club; Georgia Tech Alumni Association; Northside Shepherd Center; and Trinity Presbyterian Church.

Woodruff School Cookout
The Annual Woodruff School Cookout was held on the George P. Burdell Plaza of the Love Building the week after classes began for the fall 2003 semester. It was a very hot day. A popular item was our new tee-shirt with the theme Degrees Above the Rest. This extremely popular event gives new graduate students a chance to meet returning students and to talk with faculty and staff in an informal setting. This was also Dr. Joshi’s first cookout at the helm of the graduate studies program.

Outstanding Seniors Dinner
Each fall, the Woodruff School sponsors a dinner for outstanding seniors who are eligible to attend graduate school based on their academic record (a GPA of 3.5 and above). About eighty-five people attended the dinner and listened to faculty members explain in an anecdotal way the reasons to attend graduate school. It was also an opportunity for the seniors to meet some current graduate students and learn about their experiences. Information was available on applications, fellowships, financial aid, and the GTL program.

Family Weekend
The Woodruff School held another very successful open house for the families of Woodruff School undergraduates. Student organizations were represented. The design studio, the engineering graphics lab, and the mechatronics lab were open for inspection and demonstrations. School Chair, Dr. Ward Winer welcomed our visitors, and Dr. David Sanborn, Associate Chair for Undergraduate Studies, hosted an information and question-and-answer session about the Woodruff School.

Georga Tech Auto Show
Restored antique automobiles, 1960s muscle cars, and race cars filled the College of Management parking lot for the inaugural Georgia Tech Auto Show on March 27th. The show was sponsored by the Woodruff School and the Industrial Design Program in the College of Architecture. The show attracted more than one hundred and twenty entries from alumni, students, faculty, staff, and friends. The idea was to bring people to campus with a focus on technology and design that everyone could relate to: cars. Awards were given for the post-1984 unmodified class; the modified rear-wheel-drive category; the modified front-wheel-drive category; the truck category; and the student beater class. Sterling Skinner, Undergraduate Laboratory Coordinator, was the driving force behind the show.
LECTURES AND CONFERENCES

Woodruff School Colloquia
The Woodruff Colloquium Series highlights new developments in mechanical engineering and nuclear and radiological engineering. As such, the seminars are intended to be of interest to the entire school, rather than a specific research group. The Woodruff School Colloquia given during the past academic year were: Darvin Edwards, Texas Instruments, Packaging Challenges for Current and Future Semiconductors Technologies; Craig Hartley, Air Force Office of Scientific Research, The Challenge for Materials in Design; Yogesh Jaluria, Rutgers University, Thermal Transport in High Speed Optical Fiber Drawing and Coating; Moe Khaleel, Pacific Northwest National Laboratory, Hydrogen: The Fuel of the Future, Where Are We Now and Where Are We Going?; Kyriakos Komvopoulos, University of California, Berkeley, Surface Nanoengineering; James A. Lake, Idaho National Engineering & Environmental Laboratory, Nuclear Energy’s Role in Responding to the Energy Challenges of the 21st Century; Marc Madou, University of California, Irvine, Nanotechnology: Icarus Revisited?, Thomas Sialak, University of Virginia, Vascular Assembly and Arteriolar Remodeling: In Vivo and in Silico Approaches for Analysis and Design of Multisignal, Multicomponent Assembly Processes in Vascular Systems; Sandra M. Troian, Princeton University, Microfluidic Actuation by Modulation of Surface Stresses: From Fundamentals to Applications; Steven Vogel, Duke University, Cambered Wings and Chain Saw Cutters: When Have We Managed to Copy Nature’s Mechanical Devices; Mickey Wade, General Atomics, Recent DIII-D Research Results Aimed at Advancing the Tokamak Concept; and James E. West, Johns Hopkins University, Modern Electret Microphones and Their Applications.

The Woodruff School Goes to Washington
The Woodruff School was at the R&D Expo that was part of the ASME’s Congress and Exposition in Washington, D.C. This was the eighth year we have sponsored a booth from which to speak with potential graduate students, meet with alumni, and discuss mechanical engineering undergraduate and graduate education with conference attendees from industry and academia. It was also a terrific opportunity to hand out our CD that contains résumés of graduate students who are looking for academic positions or one in an industrial setting. Members from the ASME student chapter in the Woodruff School attended the conference and the job fair. Numerous Woodruff School faculty members presented papers and chaired sessions at the conference.

Faculty Retreat
In May 2004, the Woodruff School held a day-long faculty retreat in the Global Learning and Conference Center. The purpose of the meeting was to review the undergraduate and graduate curricula in mechanical engineering and nuclear and radiological engineering under the semester system. It has been five years since Georgia Tech converted from quarters to semesters. The curricula are also under review in anticipation of the next ABET visit.

PROGRAMS

Accreditation
Georgia Tech has institutional accreditation from the Southern Association of Colleges and Schools (SACS). The College of Engineering and its schools are accredited by the Accreditation Board for Engineering and Technology (ABET). The Co-op Program is accredited by the Accreditation Council for Cooperative Education.

Rankings
Georgia Tech and its programs are highly regarded, which is reflected in current rankings. According to U.S. News & World Report:
• Georgia Tech’s undergraduate programs are ranked 9th among public universities and 41st among all universities.
• The undergraduate program in mechanical engineering is ranked 4th in the nation.
• The graduate program in mechanical engineering is ranked 7th in the nation.
• The College of Engineering ranks 5th in the nation.
• The Georgia Tech Co-op Program ranks 3rd as a Program That Works.
• The undergraduate nuclear and radiological engineering program is ranked 11th in the nation.

Overview of the Graduate Program
According to Dr. Yogendra Joshi, Associate Chair for Graduate Studies, in the past academic year the Office of Student Services, under the leadership of Dr. Wayne Whiteman, took a number of steps to increase the efficiency and quality of their services. A web-based Student Financial Support Tracking System is now in place. Once an electronic form is submitted, only updates are entered in subsequent semesters. Another achievement was the development of a comprehensive database of currently enrolled students and new applicants. This allows the faculty to review the credentials of applicants hours after these are received at the Institute. This process used to take several weeks. We also implemented the Online Assessment and Tracking Systems (OATS) to document the educational objectives of our programs, and to assess how well these are being achieved by our graduates. The system allows us to monitor progress toward our stated goals and to put in place corrective measures, as needed.

The past academic year provided some unique challenges for the graduate program. We saw a significant reduction in the School’s endowment. In the past, we used these funds to provide topping awards to attract the very best students nationally to our
programs. These reductions occurred at the same time as state budget cuts. We also saw a reduction by about twenty percent in the number of international applicants. This trend is nationwide, and is attributed to visa-related delays and improving employment opportunities in many countries that have traditionally had a large number of applicants. Despite this reduction, we had no difficulty in attracting a sufficient number of highly qualified students. Also, the distance-learning program continues to expand.

New Degree Program: Medical Physics

The Woodruff School is pleased to announce that the Board of Regents has approved a master’s program in Medical Physics (M.S.M.P.) to be offered by the Nuclear and Radiological Engineering Program in cooperation with Emory University School of Medicine, beginning in fall 2004. There are currently about five thousand practicing medical physicists in the United States. Due to the increased complexity of equipment and the patient population, there is a steady increase in the demand for appropriately trained medical physicists. Employment prospects are excellent and salaries for these positions are very high. Students will be registered at Georgia Tech and take courses offered by Emory University through a statewide agreement. On-campus students in this program will intern at Emory University’s hospitals and clinic to gain the required four hundred hours of clinical experience in radiation therapy, nuclear medicine, and diagnostic imaging. The curriculum has both a thesis and nonthesis option. Both options include seven required courses and a clinical rotation. The program is designed to be completed in one-and-one-half years by well-motivated, full-time students. There is also a two-and-a-half year curriculum (nonthesis) for distance-learning students. Fall enrollment for the program includes ten on-campus students and 17 distance-learning students. Information about the medical physics program can be found at [www.mp.gatech.edu](http://www.mp.gatech.edu).

Georgia Tech Lorraine (GTL)

Our program in France focuses on a master of science in mechanical engineering. Students complete the degree by combining courses taken at GTL, on-campus in Atlanta, or through video and on-line course offerings. The courses at GTL are taught in English by professors from Georgia Tech who go to France on a rotating basis. Seventy-six students participated in the program in the past academic year. The fall 2004 group consists of three graduate students from Atlanta going to France and twenty-seven students from ENSAM and other schools in France coming to Atlanta. Dr. Robert Mahan is the Academic Affairs Director for GTL and Dr. Yves Berthelot coordinates the program in Atlanta.

Learn From A Distance

The Woodruff School offers both the MSME degree and the new MSMP degree as part of its distance-learning program. The admission requirements, courses, and the degree received are the same as for on-campus students. We offer approximately sixteen mechanical engineering courses each semester, except during the summer. In the past academic year, there were 200 (185 ME, 15 HP) Woodruff School graduate students involved in distance-learning classes. Many of these students have their tuition paid for by their employer. Thirty-four new distance-learning students (17 ME, 17 MP) were admitted to the Woodruff School in fall 2004.

Twenty-two ME students completed the requirements for the master’s degree (nonthesis) through the distance program in the past academic year (14 in summer 2003, 4 in fall 2003, and 4 in spring 2004). Examples of some of the companies that these students work for are: United Technologies, Lockheed-Martin, Knowles Atomic Power Lab, U. S. Navy, Harris Corporation, U. S. Air Force, and Boeing.

The Graduate Program: Women and Minorities

The Woodruff School continues to be a leading producer of graduate degrees to women and minorities. In the 2003-2004 academic year, six women earned their doctoral degrees (5 ME, 1 NE) and seventeen women earned the master’s degree (15 in ME and 2 in BIOE). The first Ph.D. in the Woodruff School given to a woman was awarded to Denise Noonan in Health Physics in 1984. In 1987, Mardi Hastings was the first woman to earn a Ph.D. in mechanical engineering. To date, 75 women have earned the Ph.D. from the Woodruff School (56 ME, 19 NE).

The Woodruff School granted its first doctoral degree to a minority student in 1978. Since then, 64 minority students have received the Ph.D. (55 ME, 9 NE). Three minority students earned a Ph.D. in the past academic year, all in ME. In addition, twenty-seven master’s degrees were awarded to minorities, twenty-five in ME and two in BIOE.

The Graduate Cooperative Program

The graduate cooperative program was established in December 1983 and is currently the largest such program in the United States for science and engineering. In 2003, there were 599 students enrolled in the program; of these, 52 were mechanical engineering students and one was a nuclear engineering student. In 2003, 150 students received their degrees with Graduate Co-op Program certificates. One hundred and forty six companies participated in placing students, an increase over the previous year.

The Five-Year BS/MS Degree Program

In fall 2001, outstanding freshmen and sophomore students in the Woodruff School were invited to apply to the new Five-Year BS/MS Degree Program. Students can earn two degrees in a five-year period, which provides a tremendous advantage when entering the job market. It might also be an impetus to continue for the doctorate. The program is individualized with numerous opportunities for faculty and students to interact, including mentoring and undergraduate research. Graduate course work begins in the senior year. The first person completed the program in 2003. Currently, there are fifty-one students in the program. Three students finished their bachelor’s degrees and matriculated into the graduate program in fall 2004. The number of applicants continues to increase for this popular program. In the past academic year, fourteen students were accepted into the program. Dr. Tom Kurfess is the Program Director.
Frank K. Webb Program in Professional Communication

The Frank K. Webb Program in Professional Communication was established in 1990 to teach students verbal and written communication skills. The Woodruff School has made the teaching of these skills an integral part of the undergraduate engineering curriculum. Program Coordinator Dr. Jeffrey Donnell provides formal instruction to students in four required laboratory and design courses: Creative Decisions and Design (ME 2110), Experimental Methodology Lab (ME 3056), Mechanical Systems Lab (ME 4053), and Capstone Design (ME 4182). Donnell instructs the students on how to prepare reports and presentations, reviews project reports, and provides written feedback to the students on their projects, reports, and presentations. In addition, he provides guides to writing skills, sample reports, and lectures on communications skills specific to engineers. Graduate students receive help with graduate school and fellowship applications. In addition, they receive instruction in communications early in their graduate careers when they are preparing their first manuscript, be it a proposal, a journal article, or a conference presentation.

Undergraduate Program Review

Dr. David Sanborn, Associate Chair for Undergraduate Studies, provided this assessment of the undergraduate program. Undergraduate enrollment was again on the increase in the past academic year. There is a strong interest in mechanical engineering with a significant number of Georgia Tech students switching to mechanical engineering as late as their senior year. Consistent with the national trend, the number of students participating in the cooperative program dropped slightly, whereas participation in internships and study abroad programs increased significantly.

The School's Undergraduate Curriculum Committee was charged with a re-examination of the curriculum. This is a normal accreditation requirement, but it was particularly timely because five years have passed since the conversion to semesters. The current program had stabilized and very few of the students who started under the quarter system were still enrolled. After comparing our curriculum to that of our peer institutions and examining the exit survey comments of hundreds of seniors, the committee agreed that the curriculum needed to be more flexible to allow students to explore additional subject areas. The program currently offers only two technical electives and no free electives. The committee recommended that courses be added in both of these areas, without increasing the total number of hours required for the degree. The faculty has endorsed this concept and the details of the program will be worked out this fall.

Study-Abroad Programs

Georgia Tech strongly believes in the importance of international experience for students. Student participation in these programs has grown steadily in recent years. During the past academic year seventy-seven Woodruff School students participated in study-abroad programs: Costa Rica Summer Program (4 students), Cuba Program (1 student), Exchange Programs (7 students), French Language for Business and Technology (3 students), German Language for Business and Technology (2 students), Georgia Tech Lorraine Summer Program for Undergraduates (23 students), History of Art and Architecture in Italy (1 student), International Academic Project (1 student), International Study/Internship Program (2 students), Non-Georgia Tech Programs (3 students), Oxford Summer Program (18 students), Pacific Study Abroad Program (11 students), and Spanish Language for Business and Technology (1 student).

The Undergraduate Cooperative Program

Since 1912, Georgia Tech has offered a five-year cooperative program to those students who wish to combine career-related experience with classroom studies. The program is the fourth oldest of its kind in the world and the largest optional co-op program in the country. Students who enroll in the program alternate between industrial assignments and classroom studies on a semester basis, completing the same course work in five years that is completed by regular four-year students. Graduates of the program receive the B.S.M.E. or the B.S.N.R.E., with a Cooperative Plan designation. In 2003, there were 480 mechanical engineering students (about 38% of our undergraduates) enrolled, the largest group in the program at the Institute. In addition, 17 nuclear engineering students participated in the program. The job placement rate for program participants after graduation is very high; many take a permanent position with the company in which they did co-op work.

The International Cooperative Program

Students can complete work assignments in a foreign country as part of the International Cooperative Program. This program is a great opportunity to utilize foreign language skills, gain a global perspective, and experience a diverse culture. Proficiency in a foreign language is necessary to earn the International Cooperative Plan designation. During the past academic year, a number of mechanical engineering students worked in Germany at Siemens, Bosch, ZF Industries, and WIKA Instruments. This program is expected to expand in the coming year.

The Undergraduate Professional Internship Program

In fall 2002, the Undergraduate Professional Internship Program was established at Georgia Tech. The first students participated in the program in spring semester 2003. This program is geared toward those students who could not or did not participate in the Cooperative Program, but want some career-related experience before graduation. Since the inception of the program, mechanical engineering students have participated: two in summer 2003, four in spring 2004, and 22 in summer 2004. Students generally work for...
one semester, typically in the summer, with an option for more work. Students are typically sophomores, juniors, or seniors because participants must have completed at least thirty hours of academic course work at Georgia Tech. Companies in which mechanical engineering students have worked are: Applied Materials, Cummins, Department of the Air Force, Eli Lilly & Company, General Electric, Robert Bosch Corp., Texas Instruments, and Siemens.

**Undergraduate Research**

Undergraduate research in the Woodruff School is usually performed as a Special Problems Course. Students work with a faculty member, and can do the work for course credit or pay, part-time or full-time. Each special problem culminates in a written final report. Dr. David Sanborn, Associate Chair for Undergraduate Studies, administers the program.

Opportunities for funding exist from the President’s Undergraduate Research Awards ( PURA). The Undergraduate Studies Office funds requests by faculty/student teams to support undergraduate student involvement in faculty research. These awards are for student salaries and travel expenses to attend professional meetings. In the past academic year, twenty students (19 ME/1 NRE) received PURA funding. Faculty advisors were: Levent Degertekin, Imme Ebert-Uphoff, Sam Graham, Yogendra Joshi, Jens Karlsson, Bill King, Jack Lackey, Marc Levenston, Richard Neu, Farzad Rahnema (NRE), Bill Singhose, Minami Yoda, Ajit Yoganathan, and Cheng Zhu.

**The United Technologies Teaching Interns Program**

The United Technologies Teaching Interns Program is funded by the United Technologies Corporation and supports a number of junior and senior mechanical engineering students for two semesters. Students are invited into the program based on their academic achievement (a 3.5 GPA is required for participation) and recommendations by the faculty. The program is intended to give students the opportunity to work with a faculty member in teaching an undergraduate course in mechanical engineering; encourage our best students to consider going to graduate school; help develop communication and interpersonal skills; and provide a way for practicing engineers and managers at United Technologies to interact with Woodruff School students. The interns for the past academic year were Bill Dalhoff (ME 3322, Richard Salant), Milnes David (ME 3180, Jeffrey Streator), and Jake Quicksall (ME 3345, Zhuomin Zhang).

**STUDENT ORGANIZATIONS**

There are a number of groups for Woodruff School students to join. These organizations offer a unique opportunity to learn about the many facets of mechanical or nuclear engineering, provide an opportunity to meet practicing professionals, and provide valuable service to the School.

**PROFESSIONAL SOCIETIES**

**American Nuclear Society (ANS)**

The student section of the ANS is the link for prospective nuclear engineers with their chosen profession. The section holds monthly meetings which feature presentations by practicing engineers. Dr. Farzad Rahnema is the faculty advisor.

**American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)**

ASHRAE is an international professional and technical society devoted to promoting the art and science of heating, refrigerating, air-conditioning, ventilation, and allied technologies. The student chapter meets twice a semester. Dr. Sheldon Jeter is the faculty advisor.

**SAE International**

SAE International furthers research, development, design, manufacture, and utilization of vehicles which operate on land and sea, and in air and space. The student section is one of the largest and most active groups on campus; they had another busy and exciting year. The highlight, and one of the most popular events in the Woodruff School, was the spring picnic, held at the end of spring semester on the George P. Burdell Plaza. Hundreds of people attended the event.

Chapter meetings featured a number of companies and chapter sponsors: Shell, Equistar, Rolls Royce, Clorox, Flowserve, Exxon/Mobil, Schlumberger, Framatome ANP, Texas Instruments, Panasonic, Shaw, BASF, Kimberly Clark, and Michelin. Other activities included the Paintball Challenge, Georgia Tech Family Night, Mystery Design Competition, a membership drive, and participation in Tech’s Diversity Day. Plant tours included Anheuser Busch, GM, McKenney’s, and Lockheed Martin. Members from the chapter also attended the Regional Meeting in Mobile, Alabama and the ASME Congress and Exposition in Washington, D.C. Dr. Jeffrey Streator is the group’s faculty advisor.

**American Society of Manufacturing Engineers (ASME)**

The ASME student chapter is one of the largest and most active groups on campus; they had another busy and exciting year. The highlight, and one of the most popular events in the Woodruff School, was the spring picnic, held at the end of spring semester on the George P. Burdell Plaza. Hundreds of people attended the event.

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**Society of Manufacturing Engineers**

The Society of Manufacturing Engineers is dedicated to serving its members and the manufacturing community through the advancement of professionalism, knowledge, and learning. Members have access to the resources needed to compete in today’s rapidly changing manufacturing environment. The student chapter meets regularly and sponsors plant trips and special events. Dr. William Singhose is the faculty advisor.
HONOR SOCIETY

Pi Tau Sigma
The Georgia Tech chapter of Pi Tau Sigma, the mechanical engineering honorary society, was recognized with an Outstanding Performance Award at its national convention at Texas Tech University. Dr. Janet Allen is faculty advisor to the group and Dr. Farrokh Mistree is secretary-treasurer for the national organization. The national office of the society is housed in the Woodruff School.

In the fall, the chapter hosted the Mechanical Challenge, a Jeopardy-type quiz competition. Sponsors for the yearly activity were Schlumberger and Kimberly Clark. Dr. David Sanborn read the questions; judges were Mario Araya (BSME 2001) from Schlumberger and Dr. Tim Patterson.

The Academic Study Program in the Woodruff School is organized by Pi Tau Sigma. Members serve as tutors for many of the required courses in mechanical engineering. The School has set aside an area in the MRDC Building for this activity.

STUDENT COMPETITION GROUPS

gt motorsports
In May 2003, an Australian team from the University of Wollongong won the Formula SAE competition in Detroit, the first time a team outside the United States won the national competition. On December 7, 2003, gt motorsports returned the favor, winning the Formula SAE Australasia event held in Tailem Bend, Australia.

The Formula SAE competition comprises a blend of static and dynamic events, intended to challenge the student’s knowledge of their car’s design, and to challenge the performance and ruggedness of the car itself. In the static events, the team placed 5th in presentation, 5th in design, and 4th in cost. In the dynamic events, the team placed first in skid pad, 7th in acceleration, and 6th in autocross. These finishes, plus a first place performance in the endurance/fuel event (40% of the total points are at stake) led to taking the award for best overall performance in the dynamic events, and, best total point score for the entire event. The team faced a number of difficulties in the course of the competition, including having to perform a complete engine change between the morning and afternoon endurance events on the last day of competition.

The team bypassed the competition in England in Summer 2003 so they could enter the Australia competition. In Spring 2004, the team had some problems in the all-important endurance race so they did not fare as well as they had in previous national competitions. Dr. Ken Cunefare is the faculty advisor.

GT Off-Road
GT Off-Road designs, builds, and races two small, off-road vehicles for the Society of Automotive Engineer’s Mini-Baja competitions. The Georgia Tech team is one of only a few that runs two cars at every race. The team designs and builds a new car from scratch each year and makes significant modifications to the previous year’s car to make it eligible to race again. Track conditions vary, but the West event is generally rocky and muddy with rough terrain, the East event includes a water maneuverability portion in which the car must float and propel itself in deep water, and the Midwest race is held at a motorcross-style track.

Car thieves cut short the team’s competition at the Mini-Baja East in Montreal, Canada, stealing a new pickup truck and a trailer that carried two custom-designed race cars and all of the team’s tools and equipment. The team returned to Atlanta, unable to compete, but they had competed in the Mini-Baja competition in Portland, Oregon in April. GM contributed $40,000 to the team so they could design and build a car for next year’s competition. Dr. Ken Cunefare is faculty advisor to the team.
Robojackets/LEGO Robot Challenge
The third annual Lego Robot Challenge was held in November. Students from five local Atlanta-area high schools learned to build robots from Lego Mindstorm Robotics Invention System kits. The students were assisted by members of the Robojackets, a competitive robotics club at Tech. With the theme of Mission Mars, the challenge was designed to introduce students to engineering; show them a variety of fields such as physics, mechanics, and electronics; give them hands-on experience in solving an engineering problem from design to construction; develop teamwork and communications skills; and give them the chance to work with engineering students at GT. Each team was comprised of three students. The Center for the Enhancement of Teaching and Learning, its STEP program, and the Woodruff School sponsored the event. Dr. Imme Ebert-Uphoff is faculty advisor to the Robojackets.

Robojackets/GT FIRST
The FIRST competition is an exciting high school robotics challenge that takes place all over the U.S. The Peachtree Regional was again held in Atlanta as fifty-two teams, more than 3,000 people, filled the Gwinnett Civic Center. The team from Wheeler High School received the Chairman’s Award at the Regional. In April, the Championship Event was held at the Georgia Dome and the World Congress Center. This first-ever Atlanta event featured more than 300 teams and 22,000 people. Dr. Wayne Book is the group’s faculty advisor.

FutureTruck
The FutureTruck Competition was held in June at the Ford Proving Ground in Florida. The team finished in 3rd place, showing how well a hybrid-electric powertrain can perform. The Hybrid-Electric Explorer had no significant problems and demonstrated great performance. The team completed all the dynamic events with no mishaps. Technicians from the Proving Ground awarded them a trophy for the team requiring the least amount of help from the technicians. For the second year in a row the team won the Acceleration event, they almost tied for first place in Consumer Acceptability, and they came in 4th in the Emission Event. Their Explorer had increased miles per gallon, with low emissions, and significantly improved performance when compared to the stock Explorer that Ford sells. Fifteen schools competed. Dr. Jerry Meisel from ECE served as faculty advisor to the students who are mainly from electrical engineering and mechanical engineering.

UMBERLAA GROUPS
Woodruff School Student Advisory Committee (WSSAC)
WSSAC is the umbrella organization in the Woodruff School and is open to all students. WSSAC advises the faculty and administration on issues that directly affect the students. Each year they sponsor two major events: the Undergraduate Research Fair and the Woodruff School Spring Banquet. They publish a newsletter (Mechanical Engineering News) each semester, help interview candidates for faculty positions, and work to improve faculty and student relations. Dr. David Sanborn advises the group.

Mechanical Engineering Graduate Students Association (MEGA)
The purpose of MEGA is to identify the academic, professional, and social needs of graduate students in the Woodruff School and provide a vehicle through which these needs can be met. They develop and promote interactions among potential, new, and current graduate students, the faculty and staff, and the community. Events include meetings, helping with recruiting, panels, and workshops on issues of interest to graduate students.
STUDENTS

ENROLLMENT

There were a total of 1327 undergraduate students in the Woodruff School in fall 2003, excluding co-op students at work. Of these, 1,232 were in Mechanical Engineering and 95 in Nuclear and Radiological Engineering. On the graduate side, we had a total of 691 students. Of these, 410 were master’s students (388 in ME, 18 in NE/HP, and 5 in BIOE), and 271 were doctoral students (237 in ME, 19 in NE/HP; and 15 in BIOE). There were also nine special students (all in ME).

<table>
<thead>
<tr>
<th>SCHOOL</th>
<th>UNDERGRADUATES</th>
<th>GRADUATES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace Engineering</td>
<td>733</td>
<td>363</td>
</tr>
<tr>
<td>Bioengineering</td>
<td>0</td>
<td>119</td>
</tr>
<tr>
<td>Biomedical Engineering</td>
<td>189</td>
<td>56</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>444</td>
<td>152</td>
</tr>
<tr>
<td>Civil and Environmental Engineering</td>
<td>510</td>
<td>317</td>
</tr>
<tr>
<td>Electrical and Computer Engineering</td>
<td>1,647</td>
<td>975</td>
</tr>
<tr>
<td>GTREP(^1)</td>
<td>95</td>
<td>0</td>
</tr>
<tr>
<td>Industrial and Systems Engineering</td>
<td>963</td>
<td>434</td>
</tr>
<tr>
<td>Materials Science and Engineering</td>
<td>70</td>
<td>108</td>
</tr>
<tr>
<td>Mechanical Engineering (includes NRE/HP)</td>
<td>1327</td>
<td>691</td>
</tr>
<tr>
<td>Paper Science and Engineering(^2)</td>
<td>0</td>
<td>43</td>
</tr>
<tr>
<td>Polymer, Textile and Fiber Engineering</td>
<td>118</td>
<td>40</td>
</tr>
<tr>
<td>Undeclared Engineering</td>
<td>449</td>
<td>0</td>
</tr>
<tr>
<td><strong>College of Engineering Totals</strong></td>
<td><strong>6,545</strong></td>
<td><strong>3,298</strong></td>
</tr>
<tr>
<td><strong>Institute Totals</strong></td>
<td><strong>11,257</strong></td>
<td><strong>5,386</strong></td>
</tr>
</tbody>
</table>

\(^1\) GTREP includes 7 ME students
\(^2\) To date, there are no paper science students with ME as their home school.

Student Body Makeup

In fall 2003, there were 2,018 students enrollment in the Woodruff School: 1,866 in mechanical engineering (1222 BS, 397 MS, 237 Ph.D.), 132 in nuclear and radiological engineering (95 BS, 18 MS, 19 Ph.D.), and 20 in bioengineering (5 MS, 15 Ph.D.). By gender and ethnicity, there were 1,135 males (86%) and 192 females (14%) for a total of 1,327 undergraduate students. Of these, 280 (21%) were minorities (note that minority includes only U.S. citizens and permanent residents: Asians, Blacks, Hispanics, American Indians, and Multiracials) and 31(2%) were internationals. On the graduate side, there were 581 males (84%) and 110 females (16%) for a total of 691 students. Of these, 98 (14%) were minorities and 208 (30%) were internationals.

New Undergraduate Academic Advisor

Ms. Kristi Lewis joined the Woodruff School as an Academic Professional and the Woodruff School’s new Undergraduate Academic Advisor. She is a 1994 honors graduate of the Woodruff School’s mechanical engineering program. While here she was a member of the marching band and was a co-op student at Ford Electronics. She also earned an M.S.M.E. from Clemson University and has ten years of industrial experience as a mechanical engineer. Her industrial experience includes manufacturing, design, and supervisory positions.

When asked about the special skills she brings to the position, she said, “I think my biggest advantage in working with the students is that I was also a student in the Woodruff School. I understand the stresses that Georgia Tech students see, and I think that my work experience is helpful in offering students advice on careers, co-op positions, and internships.” Kristi enjoys working with students. Her goal is to give Woodruff School students the support they need to have a successful academic career at Georgia Tech.
Profiles of Incoming Students
The Woodruff School continues to enroll excellent students, as shown by the class profiles of the new undergraduate and graduate students in fall 2004.

### Freshman Class Profile

<table>
<thead>
<tr>
<th></th>
<th>Mechanical Engineering</th>
<th>Nuclear Engineering</th>
<th>Georgia Tech</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average SAT Score (out of 1600)</td>
<td>1351</td>
<td>1351</td>
<td>1336</td>
</tr>
<tr>
<td>High School Grade Point Average</td>
<td>3.71</td>
<td>3.74</td>
<td>3.72</td>
</tr>
<tr>
<td>Number of Freshmen</td>
<td>299*</td>
<td>34</td>
<td>2,574</td>
</tr>
</tbody>
</table>

**Demographics (ME & NRE)**
- Females: 39
- Males: 294
- Georgia Residents: 157
- Out-of-State Residents: 176

### Graduate Class Profile

<table>
<thead>
<tr>
<th></th>
<th>635</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicants</td>
<td>635</td>
</tr>
<tr>
<td>Admitted (46% of applicants)</td>
<td>294</td>
</tr>
<tr>
<td>Matriculated (51% of those accepted)</td>
<td>149</td>
</tr>
</tbody>
</table>

Average Grade Point Average 3.51

Average Score on Graduate Record Exam
- Verbal (out of 800): 507
- Quantitative (out of 800): 736
- Analytical (out of 6.0): 4.5

**Demographics**
- Males: 125
- Females: 24
- Minorities (U.S. Citizens): 20
- Internationals: 46

**Geographical Breakdown by Undergraduate School**
- East/Northeast: 20 (14%)
- South/Southwest: 56 (38%)
- Midwest: 12 (8%)
- West/Southwest: 14 (9%)
- International: 47 (31%)

* This profile is based on information from the acceptance rates; by the time enrollment was completed we had 366 freshmen in mechanical engineering.

### CAREERS

The job market has strengthened somewhat for graduates of the Woodruff School during the past academic year. At graduation in spring 2004, 64 percent of those getting a BSME and not going to graduate school, had jobs in industry. This is a significant increase over last year, when 44 percent of Institute graduates had jobs at commencement.

The number of companies visiting Georgia Tech that wish to recruit Woodruff School students is very high. The top interviewing companies for last year were: Accenture, General Motors, Georgia Department of Transportation, Harris Corporation, IBM, Lockheed-Martin, Radiant Systems, Schlumberger, Shell, and Siemens.

The reported starting salaries in spring 2004 for those with a BSME were: $52,000 (median), $38,000 (low), and $75,000 (high). The median signing bonus was $3,500. The median starting salary for those with a BSNRE was $51,000. The most current data for the master’s degree in mechanical engineering was from the end of the fall 2003 term. The median salary was $63,000, with a low of $61,000 and a high of $105,000. There is no reported salary information for those receiving doctoral degrees. These numbers reflect only those students who reported salary information to Career Services, which is a very small percentage of our graduates.

### HONORS

**Katherine Adams** received an Impact Scholarship for 2004-2005 from Georgia Tech Auxiliary Services.

**Ashante Allen** received a Ford Foundation Predoctoral Fellowship. Dr. Sam Graham is her advisor.

**Joe Charest** won an NSF Graduate Research Fellowship. Dr. Bill King is his advisor.

**James Ford** received a NASA-Harriett G. Jenkins Predoctoral Fellowship. Dr. David Parekh is his advisor.

**Ben Forget** won a 2004-2005 Robert S. Landauer, Sr. Fellowship from the Health Physics Society. Dr. Farzad Rahnama is his advisor.

**Carl Hanna, Jennifer Muncy, and Sathyan Subbiah** received Manufacturing Education Program (MEP) Fellowships. MEP is the educational arm of Georgia Tech’s Manufacturing Research Center. Drs. Suresh Sitaraman, Daniel Baldwin, and Shreymes Melkote are their respective advisors.

**Kathryn Harper** received the University Research Alliance Fellowship from the Department of Energy. Dr. Sam Shelton is her advisor.

**Nathan Masters** was selected as one of the ASME Graduate Teaching Fellows for the 2004-2005 academic year. Dr. Wenjing Ye is his advisor.

**Jeffrey McLean** won the Best Student Paper Award in Transducers at the 2003 IEEE International Ultrasonics Symposium. In addition, Jeff won one of the five Research Partnership to Secure Energy for America fellowships given for 2004. Dr. Levent Degertekin is his advisor.

**Bill Dates** received an award in the Georgia Tech Student Paper Competition sponsored by Science Applications International Corporation. His advisor is Dr. Chris Lynch.

**Shawn O’Connor** received the Rank William & Dorothy Given Miller Auxiliary Scholarship from the Board on Engineering Education of the ASME.

**Jack Palmer and Anne-Marie (Albanese) Lerner** are graduate fellows in Georgia Tech’s STEP (Student and Teacher Enhancement Partnership) program. They work with students at Rockdale Magnet School, teaching and enhancing the research classes at the accelerated high school. Drs. Wayne Whiteman and Kenneth Cunefare are their respective advisors.
Frank Pyrtle received a 2003 Grant-in-Aid Research Award from Sigma Xi. Dr. Bill Black is his advisor.

Michael Robertson won a Student Educational Partnership Award at Georgia Tech's Student Honors Day. Dr. William Singhose is his advisor.

Nathan Rolander received an Honorable Mention in the NSF Graduate Research Fellowship competition. Dr. Yogendra Joshi is his advisor.

Rahul Sathe, a new graduate student, received an Honorable Mention in the NSF Graduate Research Fellowship Competition.

Thom Sokol received a scholarship from the German Academic Exchange under the German American Initiative in Science and Technology.

Shannon Stott received a Georgia Tech Student Paper Competition Award from Science Applications International Corporation. Dr. Jens Karlsson is her advisor.

Norman C. Trammell received an award in the Georgia Tech Student Paper Competition sponsored by Science Applications International Corporation. His advisor is Dr. Kok-Meng Lee.

Markus Wegner received a German Academic Exchange Grant from the German-American Initiative in Science and Technology.

Meagan Wright, a new graduate student, received an Honorable Mention in the NSF Graduate Research Fellowship Competition.

Macfield Young received a grant from the German Academic Exchange from the German-American Initiative in Science and Technology.

Sai Zeng received an IBM Fellowship. Dr. Bob Fulton was her advisor.

Hailong Zhu received an Impact Scholarship for 2004-2005 from Georgia Tech Auxiliary Services. Dr. Wayne Book is his advisor.

Qi Angela Zhu received a Best Ph.D. Thesis Award from the Georgia Tech Chapter of Sigma Xi. Dr. Suresh Sitaraman is her advisor.

Student Honors Day Awards

Awards are announced at Student Honors Day held in April. The winners are chosen by the Associate Chair for Undergraduate Studies and the Undergraduate Academic Advisor with approval by the School Chair, Dr. Ward O. Winer. This year's recipients are:

- Pi Tau Sigma Outstanding Sophomore, Junior, and Senior Awards for demonstrating outstanding scholarship and service to the School and student activities: Christopher Clarke, Stephanie Campbell, and Milnes David.
- Richard K. Whitehead Jr. Memorial Award, which is given to an outstanding mechanical engineering senior who exemplifies high standards of scholarship and service: Milnes David.
- Samuel P. Eschenbach (class of 1933) Memorial Award in Mechanical Engineering, based on academic performance, leadership capabilities in the campus community, and promise as a mechanical engineer: Shawn O’Connor.
- Woodruff School Chair’s Award for outstanding scholarship and contributions to the School, especially to its program by a graduating senior: Steven Schrader.
- Woodruff School Outstanding Scholar Award, which recognizes a graduating senior who has achieved an exceptional scholastic record in the mechanical engineering program: Catherine Von Reyn.

The Briaerean Scholarship Cup honors the graduating co-op student with the highest grade point average: Milnes David.

SCHOLARSHIPS

Many awards recognize academic achievement and outstanding service to the School, the College of Engineering, and the Institute.

HOPE Scholarships

Many undergraduate students in the Woodruff School receive some type of scholarship. Half of our in-state students receive HOPE scholarships, the tuition program financed through the Georgia State Lottery.

President’s Scholars

The President’s Scholar Program, which began in 1981, identifies students who have excelled in academia and leadership. Financial awards are for four academic years, and students are expected to maintain honors-level academic performance and to be involved in campus or community activities. The program is funded entirely by endowments and annual contributions from Georgia Tech’s alumni, industry supporters, and other friends through the Roll Call annual giving program. In fall 2004, sixty-four new President’s Scholars enrolled at Georgia Tech. Of these, eleven are mechanical engineering students: Kevin Bell, Sam Britt, Ryan DeMars, Josh Figured, Bradley Herrmann, Drew Hess, Tauhira Hoossainy, Brandon Kearse, Kyle Schwing, James Waring, and Rachel Wheeler.

Other Woodruff School students currently enrolled as President’s Scholars are: Kevin Bell, Sam Britt, Chris Clarke, Will Cross, Annie Davis, Ryan DeMars, Eric Deutsch, Josh Figuered, Parag Gajarawala, Chris Hannemann, David Harman, David Harris, Lindsey Heine, Bradley Herrmann, Drew Hess, Tauhira Hoossainy, Alex Johnson, Brandon Kearse, Joey Kenny, Scott Kerko, Rahul Kirtikar, Kirsten Lundstrom, Chris Madsen, Matt Madsen, John Malek, Gavin McDonald, Dan Muxie, Andy Powell, Matthew Prohaska, Adam Reich, Jen Schur, Kyle Schwing, Nate Scripps, Scott Spencer, Cielle Thibodeaux, Carla Uribe, James Waring, Brent West, and Rachel Wheeler.

Woodruff School Scholarships

The Woodruff School has a number of designated scholarships and awards for mechanical engineering students who excel in scholarship, leadership, and service to the School. Because of its strong ties with industry, government, and foundations, the Woodruff School attracts an unusual number of scholarship opportunities. Recipients are selected by the Associate Chair for Undergraduate Studies and the Undergraduate Academic Advisor after a review of résumés and an interview.
Women in Engineering Scholarships
In 2004, Woodruff School students received scholarships from the Women in Engineering Program: Katherine Adams (Boeing Scholarship); Jennifer Cho (Ford Scholarship); Kathryn Harper (Alcoa Scholarship); Johanna Kauffman (Lockheed Scholarship); Rebecca Rigsby (United Technologies Scholarship); Jennifer Robinson (GMS Scholarship); Jennifer Schur (Honda Scholarship); Alice Snedeker (Boeing Scholarship); Hannah Wynn (GMC Scholarship); and Sarah Brashear (NRE Program, Boeing Scholarship). According to Dr. Mimi Philibos, Director of the Women in Engineering Program, there were a record number of 409 women engineering students with a GPA of 3.35 and above.

Unique scholarship opportunities exist for Georgia Tech undergraduate students in Nuclear and Radiological Engineering. Most scholarships begin in the freshman year and are based on academic achievement. Sponsoring organizations include: American Nuclear Society, CH2M-Hill, Department of Energy, Duke Energy Corporation, Framatome-ANP, McCallum-Turner, MGP Instruments, National Academy for Nuclear Training, and Dominic Napolitano, American Nuclear Society.

NRE Scholarships
In 2004, Woodruff School students received scholarships from the Women in Engineering Program: Katherine Adams (Boeing Scholarship); Jennifer Cho (Ford Scholarship); Kathryn Harper (Alcoa Scholarship); Johanna Kauffman (Lockheed Scholarship); Rebecca Rigsby (United Technologies Scholarship); Jennifer Robinson (GMS Scholarship); Jennifer Schur (Honda Scholarship); Alice Snedeker (Boeing Scholarship); Hannah Wynn (GMC Scholarship); and Sarah Brashear (NRE Program, Boeing Scholarship). According to Dr. Mimi Philibos, Director of the Women in Engineering Program, there were a record number of 409 women engineering students with a GPA of 3.35 and above.

FELLOWSHIPS
From July 1, 2003 to June 30, 2004, Woodruff School students were awarded more than two-and-a-half million dollars in fellowships for graduate study. The impressive quality of our graduate students is demonstrated by the presence of more than 90 Georgia Tech President's and Institute Fellows and 116 winners since 1990 of the prestigious National Science Foundation Graduate Research Fellowship.

Acoustical Society of America Fellowship
Gaylon Hollis

Advanced Accelerator Applications University Fellowship Program
Lee Van Duyne

Achievement Rewards for College Scientists
Foundation
Matthew Allen
Anne Marie Albanese
Erika Ooten-Biediger
Charlotte Kotas
Peter Kotke
Susan Stewart
Susan Stott

American Heart Association Fellowship
Jonathan Butler
Nicole Hurley

ASME Graduate Teaching Fellowship
Susan Stewart

Computational Science Graduate Fellowship
Nathaniel Morgan
Department of Defense
I.S. Fellowship
Carmen Greene

Department of Education Graduate Assistance in Areas of National Need
Cornelius Ejimofor
Neal Hall
Stephen Reiman
Edward Wong

Department of Energy Fellowship
Samuel Durbin
Alex Mychkovsky

Department of Homeland Security Fellowship
Ted Mayle

Ford Foundation Predoctoral Fellowship
Kathryn Harper

George Wingfield Semmes Memorial Scholarship
Esinam Glakpe

Georgia Tech Institute Fellowship
Jason Aughenbaugh
Paul Bosscher
Joe Charest
Charlotte Kotas
Ryan Krauss
Andrea Lay

Robert MacMeccan
Nathan Masters
John Meacham
Catherine Reyes
Harry Rowland
Philip Voglewede

Georgia Tech President's Fellowship
Anne Marie Albanese
Adya Ali
Matthew Allen
Jeff Badertscher
Douglas Bakum
Jonathan Barletta
John Berg
Erika Ooten-Biediger
Scott Bondi
JoSette Broiles
Jonathan Butler
Maria Isabel Camasciati
Matthew Chamberlain
Michael Colella
Rhina Coleman
John Connelly
Ted Conrad
Karen Deen
Mary Douglas
Eric Dumbaga
Scott Duncun
Samuel Durbin
Tarek El-Shazly
Timothy Ferguson
Marco Fernandez
Alicia Fortier
Nathan Gallant
Donavan Gerly
Christopher Gerly
Christopher Green
Mike Haberman
Neal Hall
Sarah Herbison
Mark Holdhusen
John Huey
Ryan Johnson
Robert Kenny
Jesse Killion
Joshua Knight
Timothy Koehler
Michael Kohl
Peter Kotke
Jason Lawrence
Margaret Lowder
Jeffrey McLean
Logan McLeod
Kristin Michael
Greg Mocko
Nathan Morgan
Jennifer Muncy
Pamela Murray
Harry Rowland
Catherine Reyes
John Meacham
Nathan Masters
Robert MacMeccan
Alex Mychkovsky
Srinidhi Nagaraja
Brent Nelson
James Nichols
Ashley Palmer
Matthew Pavlick
Andrew Perkins
Blaise Porter
John Reap

Sergio Lopez, MGP Instruments; Farzad Rahnema, Chair of the NRE/MP Program; David Sandborn, Associate Chair for Undergraduate Studies; Ann Winters, National Academy for Nuclear Training, and Dominic Napolitano, American Nuclear Society.
Ramiro Rivera-Rivera
Galen Robertson
Felipe Roman
Andrew Schnell
Jevin Scrivens
Brian Shellabarger
Katherine Shilling
Thomas Paul Smith
Douglas Spearot
Jiani-Cheng Su
Sten-Ove Tullberg
Eric Vanderploeg
Robert Waddell
Benjamin Wagner
Andrew Walt
Brian Wayman
Paul Wickersham
Christopher Williams
Jamal Wilson
Sebastian Wolff
Tanya Wright

Glenn Fellowship
Ulf Andresen
Douglas Bakum
Jonathan Barletta
John Berg
Joe Charest
Ted Conrad
Michael DeSalvo
Christopher Green
Lisa Ellis
James Ford
Benoit Forget
Joseph Frankel
Tracy Haverty
Haschingh Crystal Hsu
Patrick Opdenbosch
Jeffrey Rambo
Christopher Rinehart
Sathyam Subbiah
Harry Rowland
Nathan Weiland
Tracie (Zoeller) Durbin

Goizueta Foundation Fellowship
Maria-Isabel Carnasciali
Alicia Fortier

Graduate Education for Minorities Fellowship
Ricky Brathwaite
Marielsa Edje
Sarne Hutcherson
Jeffrey Jones

Hertz Fellowship
Carolyn Seepersad

Intel Fellowship
Scott Bondi

Intel Foundation
Ph.D. Fellowship
Meghan Shilling
Morris Bryan Fellowship
Siarhei Triareshka

National Academy for Nuclear Training Fellowship
James Maddox

NASA Graduate Student Research Program
Thomas Smith

NASA-Harriet Jenkins Predoctoral Fellowship
Ashané Allen
Janine Johnson
Omar Mireles
Ramiro Rivera-Rivera
Jamal Wilson

National Defense Science and Engineering Graduate Fellowship
Paul Bosscher
David Damm
Peter Kottke

National Institutes of Health Training Grant
Stacey Schultz
Shannon Stott

National Physical Science Consortium Fellowship
Michael Woodmansee
Tracie (Zoeller) Durbin

National Science Foundation
Graduate Research Fellowship
Matthew Allen
Jason Aughenbaugh
JoSette Broiles
Matthew Chamberlain
Joseph Charest
John Connelly
Adam Coutee
Hsingching Crystal Hsu
John Huey
Juan-Carlos Jakaboski
Charlotte Kotas
Andrea Lay
Robert MacMeccan
John Meacham
Kristin Michael
Pamela Murray
Galen Robertson
Felipe Roman
Andrew Schnell
Eric Vanderploeg

NSF Integrative Graduate Education and Research Traineeship Fellowship
Tarek El-Shazly
Marco Fernandez
Ryan Johnson
Gregory Mocko
Laura Rowe
Christopher Williams
Sebastian Wolff

Office of Naval Research Fellowship
Alli Gordon
Sundiata Jangha

Packard Fellowship
James Ford
Christopher Green
Jamal Wilson

Research Partnership to Secure Energy for America Fellowship
Jeffrey Meclan

Robert S. Landauer, Sr. Fellowship
Zhongliu Wang

Sandia Fellowship
Joe Charest
Harry Rowland

U. S. Air Force Traineeship
Donald Rhymer

U. S. Coast Guard Traineeship
Matthew Hammond

U. S. Navy Traineeship
Joshua Hawkes

United Technologies Fellowship
Mary Elizabeth Douglas

Whitaker Fellowship
Catherine Reyes
Brian Wayman

Woodruff Fellowship
Ali Adya
Anne Marie Albanese
Matthew Allen
Ulf Andresen
Jeff Badertscher
Douglas Bakum
Jonathan Barletta
John Berg
Erika Oden Biediger
Benjamin Byers
Maria-Isabel Carnasciali
Joe Charest
Michael Colella
Rhima Coleman
Ted Conrad
Karen Deen
Michael DeSalvo
Gerty Donavon

Mary Beth Douglas
Scott Duncan
Sam Durbin
Lisa Ellis
Tarek El-Shazly
James Ford
Benoit Forget
Alicia Fortier
Joseph Frankel
Nathan Gallant
Julien Gallin-Martel
Christopher Green
Michael Haberman
Tracy Haverty
Joshua Hawkes
Mark Holdhusen
Hsingching Crystal Hsu
Stacy Imler
Juan-Carlos Jakaboski
Robert Kenny
Jesse Killion
Joshua Knight
Timothy Koehler
Michael Kohl
Jason Lawrence
Margaret Lowder
Leland Marcus
Jeffrey McLean
Logan McLeod
Jennifer Muney
Pamela Murray
Alexander Mychkovsky
Srinidhi Nagaratna
James Nichols
Patrick Opdenbosch
Matthew Pavlick
Andrew Perkins
Braje Porter
Frank Pyrtle
Jeffrey Rambo
John Reap
Christopher Rinehart
Harry Rowland
Benay Sager
Jevin Scrivens
Kimberly Sheafe
Brian Shellabarger
Katherine Shilling
Thomas Smith
Douglas Spearot
Susan Stewart
Jiani-Cheng Su
Sathyam Subbiah
Sten-Ove Tullberg
Benjamin Wagner
Nathan Weiland
Tanya Wright
Tracie (Zoeller) Durbin

Woodruff School GTL Fellowship
Brian Frankey
Marielsa Edje
Sarah Herbison
Alexander Mychkovsky
Keith Suda-Cederquist
Lisa Ellis

Woodruff School High Score on Ph.D. Qualifying Exams
Benoit Forget
Keunhan Park
Krishna Tunga

Woodruff School Teaching Internship
Susan Stewart
In 1888 when Georgia Tech opened, mechanical engineering was the only degree-granting program. Today, the Woodruff School offers two undergraduate degrees and eight graduate degrees. In addition, the master’s degree can be completed off-campus through the distance-learning program, which employs a combination of technologies, including video, CD-ROM, and the Internet. This report details the degrees awarded from summer 2003 to spring 2004.

### Undergraduate Degrees Awarded

During the past academic year, 302 undergraduate degrees (292 ME, 10 NRE) were awarded in the Woodruff School: 66 in summer 2003, 112 in fall 2003, and 124 in spring 2004. There were 261 males (253 ME and 3 NRE) and 41 females (38 ME and 2 NRE). By ethnicity, there were 30 Asians, 16 Blacks, 11 Hispanics, 1 Native American, 6 Multiracial, 9 Internationals, all in ME, and 229 Whites (219 ME, 10 NRE).

### Fall 2003

- Michael Adams
- Eric Ames
- Jared Barber
- Laura Baum
- David Beaulieu
- Zachary Betsill
- Jesse Birbach
- Jason Birnbbaum
- Colin Black
- Christopher Bland
- Colin Boling
- Jacob Brand
- Jeffrey Brannon
- Emil Cefaro
- Ian Campbell
- Andrew Cannon
- Thach Cap
- Timothy Carlton
- Josh Cavender
- Jay Cermeno
- Alex Chong
- Anjali Choudar
- Itt Chosupin
- Ryan Clonon
- Clayton Cooper
- Maria Cordero-Garcia
- Frenk Dawson
- Birth Do
- Julie Dowling
- William Dooley
- Jarret Dunn
- Brian Ehric
- Eric Eian
- Dustin Fichter
- Anna Finchler
- Benjamin Foltz
- Scott Gibbons
- Brett Gilbert
- Craig Goldstein
- Michael Gootman
- Jason Graning
- Samuel Hale
- Bradley Hall
- Patrick Harden
- Christher Healy
- Richard Hearn
- Robert Hereby
- Philip Herbert
- Tu Hoang
- Thomas Holst
- Karl Hyde
- Jennifer Indech
- John Jackson
- Phillip Jaquith
- Jeremiah Johnson
- Kenneth Jones
- John King
- Daniel Kinneccom
- Chad Linn
- Christyn Magill
- Jonathon Maltach
- Marquis McDuffie
- Daniel Miccet
- Anish Momaya
- Cameron Moore
- Tiffany Morrow
- Christopher Newlin
- Kxang Nuyuyen
- Michael Nichols
- Kevin O’Connor
- Chrvu Parshk
- Jayeep Park
- Matthew Parker
- Erika Parra
- Jason Peters
- Joseph Plumley
- Matthew Prather
- Ikram Rahim
- Lesley Ribble
- Brandon Rice
- Erika Rokicki
- Fernando Rosario
- Michael Ruff
- Jonathan Sada
- Erika Schnieder
- Carna Schlotman
- Katherine Seymour
- Brandon Shuman
- Daniel Sineway
- Michael Skene
- Robert Stachow
- Kathleen Stokes
- Anthony Sullivan
- Douglass Tackney
- Amos Tam
- Jason Taylor
- Trevor Taylor
- Geoffrey Toon
- Norman Trammell
- Colleen Twee
- Robert Urey
- Raymond Varona
- Catherine Von Reyt
- Edwin Wade
- Brian Walker
- Brandon Ward
- Thomas Weathers
- Brody Weber
- Nathan Weidner
- Mark Whitney
- Christopher Williamson
- John Wos

### Spring 2004

- Cindy Allen
- Shreyas Balakrishnan
- Victoria Beavers (NRE)
- Jason Branch
- Samuel Halle
- Bradley Hall
- Patrick Harden
- Christopher Healy
- Richard Hearn
- Robert Hereby
- Philip Herbert
- Tu Hoang
- Thomas Holst
- Karl Hyde
- Jennifer Indech
- John Jackson
- Phillip Jaquith
- Jeremiah Johnson
- Kenneth Jones
- John King
- Daniel Kinneccom
- Chad Linn
- Christyn Magill
- Jonathon Maltach
- Marquis McDuffie
- Daniel Miccet
- Anish Momaya
- Cameron Moore
- Tiffany Morrow
- Christopher Newlin
- Kxang Nuyuyen
- Michael Nichols
- Kevin O’Connor
- Chrvu Parshk
- Jayeep Park
- Matthew Parker
- Erika Parra
- Jason Peters
- Joseph Plumley
- Matthew Prather
- Ikram Rahim
- Lesley Ribble
- Brandon Rice
- Erika Rokicki
- Fernando Rosario
- Michael Ruff
- Jonathan Sada
- Erika Schnieder
- Carna Schlotman
- Katherine Seymour
- Brandon Shuman
- Daniel Sineway
- Michael Skene
- Robert Stachow
- Kathleen Stokes
- Anthony Sullivan
- Douglass Tackney
- Amos Tam
- Jason Taylor
- Trevor Taylor
- Geoffrey Toon
- Norman Trammell
- Colleen Twee
- Robert Urey
- Raymond Varona
- Catherine Von Reyt
- Edwin Wade
- Brian Walker
- Brandon Ward
- Thomas Weathers
- Brody Weber
- Nathan Weidner
- Mark Whitney
- Christopher Williamson
- John Wos

### Bachelor’s Degrees

- 1386
- 858
- 233

### Master’s Degrees

- 78
- 80
- 15

### Doctoral Degrees

- 19
- 7
- 10

### Aerospace Engineering

- 98
- 13
- 16

### Biomedical Engineering

- 21
- 13
- 105

### Chemical and Biomolecular Engineering

- 303
- 193
- 22

### Civil and Environmental Engineering

- 8
- 12
- 7

### Electrical and Computer Engineering

- 302
- 165
- 30

### Industrial and Systems Engineering

- 1386
- 858
- 233

### Materials Science Engineering

- 78
- 80
- 15

### Mechanical Engineering (and NRE/HP)

- 19
- 7
- 10

### Polymer, Textile and Fiber Engineering

- 8
- 12
- 7

### Totals for COE

- 1386
- 858
- 233
## Graduate Degrees Awarded

In the period from summer 2003 through spring 2004, the Woodruff School awarded 195 graduate degrees: 165 master’s (156 MSME, 4 MS, 4 BioE, 1 MSHP) and 30 doctoral degrees (28 ME, 1 NE, 1 BioE). In summer 2003, there was a total of 55 degrees (45 master’s and 10 Ph.D.’s); in fall 2003, 60 degrees were awarded (52 master’s and 8 Ph.D.’s); and in spring 2004, we granted 80 degrees (68 master’s and 12 Ph.D.’s). By gender, 172 males received graduate degrees (148 master’s, 24 Ph.D.’s) and 23 females received graduate degrees (17 master’s and 6 Ph.D.’s). By ethnicity, there were ten Asians (9 MS, 1 Ph.D.), 8 Blacks (7 MS, 1 Ph.D.), 8 Hispanics (4 MS, 4 Ph.D.), 64 Internationals (51 MS, 13 Ph.D.), 101 Whites (84 MS, 14 Ph.D.), and 4 Multiracials (3 MS, 1 Ph.D.).

### SUMMER 2003 GRADUATES

<table>
<thead>
<tr>
<th>NAME</th>
<th>DEGREE</th>
<th>ADVISOR</th>
<th>THESIS TITLE</th>
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<td>Alajbegovic, Vahidin</td>
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<td>Design and Development of a Test Apparatus for a Downhole Tool Medal Face Mechanical Seal</td>
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<td>Indian Institute of Technology</td>
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<td>Ultrasonic Detection of Debonding Within a Gradient Enhanced Piezoelectric Actuator</td>
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<td>Fixturing Analysis and Synthesis for Flexible Circuit Board Assembly</td>
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<td>Asymmetric Thermal Cycles: A Different Approach to Accelerated Reliability Assessment of Microelectronic Packages</td>
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<td>Evaluation of New Generation Titanium Composites for the 3rd Generation RLV</td>
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<td>Modeling of Composites at Micro- and Nano-Scale and a New Approach to the Problem of a Concentrated Force on a Half-Plane</td>
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<td>Jouan, Gurvan</td>
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<td>Quantitative Measurements of Flow Within a Polymer Scaffold Inside a Compressed Perfusion Biorector</td>
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<td>Lee, Young</td>
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<td>The Real-Time Implementation of Hardware-in-the-Loop System on the Different RTOS Platforms</td>
<td>Pusan National University, Korea</td>
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<td>Ma, Lunyu</td>
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<td>Suresh Sitaraman</td>
<td>Design and Development of Stress-Engineered Compliant Interconnect in Microelectronic Packaging</td>
<td>Jiao Tong University, Shanghai</td>
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<td>Mailbec, Aurelien</td>
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<td>Moloney, Christopher</td>
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<td>Visual and Analytical Characteristics for the Identification of Complex Modes</td>
<td>Virginia Tech</td>
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<td>Moux, Janna</td>
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<td>O’Leary, Timothy</td>
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<td>Patel, Amuj</td>
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<td>Pierce, Robert</td>
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<td>David Rosen</td>
<td>A Method for Integrating from Errors into Tolerance Analysis</td>
<td>Georgia State</td>
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<td>Porter, Blaise</td>
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<td>Robert Gilberg</td>
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<td>Raguhi, Anand</td>
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<td>Shreyes Melkote</td>
<td>Prediction of Workpiece Location as a Function of Fixture-Induced Errors</td>
<td>University of Illinois</td>
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<td>Rathnam, Sharad</td>
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<td>Bert Bras</td>
<td>Designing an Environmentally Conscious Decision Support Tool for Capital Investments in Small and Medium Enterprises</td>
<td>University of Maine</td>
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<td>Rios, Erick</td>
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<td>Jonathan Colton</td>
<td>Design and Manufacturing of Plastic Micro-Cantilevers By Injection Molding</td>
<td>MIT</td>
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<td>Sanchez, Rene</td>
<td>MSME</td>
<td>Cheng Zhu</td>
<td>Dissecting Contributions of Structural Elements of PSGL-1 to Its Interaction with P-Selectin Using AFM</td>
<td>Georgia Tech</td>
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</table>
## SUMMER 2003 GRADUATES

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<th>NAME</th>
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<th>THESIS TITLE</th>
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<tr>
<td>Shannon, Michael</td>
<td>MSHP</td>
<td>Nolan Hertel</td>
<td>An Illicit Nuclear Material Detection System Based on Photoneutron and Photofission Interactions</td>
<td>Embry-Riddle Aeronautical University</td>
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<td>Siebenaler, Shane</td>
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<td>Shreyes Melkote</td>
<td>Finite Element Approach to Modeling Deformation in a Fixture – Workpiece System</td>
<td>Georgia Tech</td>
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<td>Tamburello, David</td>
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<td>Parametric Analysis of the Synthetic Air Jet Using Numerical Simulations</td>
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<td>Observation and Modeling of Heterogeneous Coarsening in 60Sn-40Pb</td>
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<td>Collaborative Multidisciplinary Decision Making in a Distributed Environment</td>
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<td>Hierarchical Modeling of the Mechanical Behavior of Human Trabecular Bone</td>
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<td>Zhu, Qi</td>
<td>Ph.D. (ME)</td>
<td>Suresh Sitaranan</td>
<td>Helix-Type Compliant Off-Chip Interconnect for Microelectronic Packaging</td>
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## FALL 2003 GRADUATES

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<td>Systems Development for High Temperature, High Strain Rate Material Testing of Hardeneds for Plasticity Behavior Modeling</td>
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The Woodruff School maintains a standard of excellence in all the core, traditional areas of mechanical engineering, as well as in other interdisciplinary areas and applications such as acoustics, bioengineering, materials, microelectromechanical (MEMS), nanotechnology, paper science, and tribology. The School also has complete programs in Nuclear and Radiological Engineering and Medical Physics.

DEMOGRAPHICS

The Woodruff School currently (fall 2004) has 72 tenure-track faculty. In addition, eight faculty members have joint appointments in the Woodruff School. Of this total, fourteen have endowed chairs or distinguished professorships. We also have twenty-two research faculty, five academic professionals, and a support staff of forty-nine. We average twenty postdoctoral fellows and fifteen visiting scholars each semester. By gender, there are fourteen male distinguished professors, 35 male full professors, 20 male and two female associate professors, and eight male and one female assistant professors. The research faculty has seventeen males and five females; there are four male and one female academic professionals.

Academic Faculty

Said I. Abdel-Khalik, Southern Nuclear Distinguished Professor
Ph.D., University of Wisconsin, 1973
Research areas: Fission; Heat Transfer
Reactor engineering and thermal-hydraulics, two-phase flow and heat transfer, and inertial fusion technology
Fellow of ANS and ASME
Holds three U. S. patents

Frederick W. Ahrens, Professor
Ph.D., University of Wisconsin, 1971
Research areas: Heat Transfer; Fluid Mechanics
Heat and mass transfer, drying, transport phenomena in porous media, thermal and energy systems modeling, simulation, and optimization
Holds seven U. S. patents

Cyrus Aidun, Professor
Ph.D., Clarkson University, 1985
Research areas: Fluid Mechanics; Bioengineering
Multiscale computational analysis, suspended particle and fiber hydrodynamics and biocellular transport
Holds eight U. S. patents

Daniel F. Baldwin, Associate Professor
Ph.D., Massachusetts Institute of Technology, 1994
Research areas: Manufacturing; MEMS
Interconnection, packaging, and integration of MEMS, optoelectronics, microelectronics devices/assemblies, electronic manufacturing/assembly and polymer processing
Holds six U. S. patents

Yves H. Berthelot, Professor
Ph.D., University of Texas, 1985
Research area: Acoustics/Dynamics
Acoustics, laser instrumentation in acoustics, and ultrasonics
Fellow of ASA
Holds two U. S. patents

Wayne J. Book, HUSCO/Ramirez Distinguished Chair in Fluid Power and Motion Control and Professor
Ph.D., Massachusetts Institute of Technology, 1974
Research areas: Automation/Mechatronics; Acoustics/Dynamics
Robotics, automation, modeling, fluid power, and motion control
Fellow of ASME and IEEE
Holds four U. S. patents

Bert A. Bras, Professor
Ph.D., University of Houston, 1992
Research areas: Manufacturing; MEMS
Manufacturing, polymer/composites processing, rapid prototyping, nano/microfabrication, and bioengineering
Fellow of ASME and IEEE
Holds five U. S. patents

Kenneth A. Cunefare, Associate Professor
Ph.D., Pennsylvania State University, 1990
Research areas: Acoustics/Dynamics; CAE/Design
Active/passive noise and structural acoustic control, modeling and control of brake squeal, fluid-structure interaction, and optimal acoustic design
Fellow of ASA
Holds one U. S. patent

Steven Danyluk, Morris M. Bryan, Jr. Chair in Mechanical Engineering for Advanced Manufacturing Systems and Professor
Ph.D., Cornell University, 1974
Research areas: Manufacturing; Tribology
Semiconductor processing, lubricant-surface interaction, polishing, and sensors
Fellow of ASME, ASMI, and STLE
Holds two U. S. patents

J. Nari Davidson, Associate Dean of Engineering and Professor
Ph.D., University of Michigan, 1969
Research area: Heat Transfer
Academic administration, engineering education, plasma physics, and power plant operation

F. Levent Degertekin, Assistant Professor
Ph.D., Stanford University, 1997
Research areas: MEMS; Acoustics/Dynamics
Micromachined sensors and actuators, ultrasonics, atomic force microscopy, and nondestructive evaluation
Holds twelve U. S. patents

Cassiano de Oliveira, Professor
Ph.D., University of London, England, 1987
Research area: Fission
Numerical radiation transport, computational fluid flow and molecular flow and numerical modeling

Imme Ebert-Uphoff, Associate Professor
Ph.D., Johns Hopkins University, 1997
Research areas: Automation/Mechatronics; CAE/Design
Robotics, theoretical kinematics, dynamics, parallel manipulators, and digital clay
Andrei G. Fedorov, Assistant Professor
Ph.D., Purdue University, 1997
Research areas: Heat Transfer; Fluid Mechanics
Catalysis and fuel cells, chemical and electrochemical
ensors, atomic force microscopy, and thermal radiation

Aldo A. Ferri, Associate Professor
Ph.D., Princeton University, 1985
Research areas: Acoustics/Dynamics; Automation/Mechtronics
Acoustics, structural dynamics, and nonlinear dynamics
and control

Robert E. Fulton,* Professor
Ph.D., University of Illinois, 1960
Research area: CAE/Design
Finite-element methods, structural mechanics, integrated
CAD/CAM, information management, and electronic commerce
Fellow of ASME
* Dr. Fulton passed away in spring 2004.

Srinivas Garimella, Associate Professor
Ph.D., Ohio State University, 1990
Research areas: Heat Transfer, Fluid Mechanics
Sustainable technologies, phase change in microchannel and
compact heat exchangers, and heat and mass transfer in
binary mixtures
Holds three U. S. patents

Andres J. Garcia, Associate Professor
Ph.D., University of Pennsylvania, 1996
Research area: Bioengineering
Cellular and tissue engineering, cell adhesion, and
biomaterials
Holds one U. S. patent

S. Mostafa Ghiaasiaan, Professor
Ph.D., University of California, Los Angeles, 1983
Research areas: Heat Transfer; Fission
Multiphase flow, aerosol and particle transport, microscale
heat transfer, and nuclear reactor thermal-hydraulics
Fellow of ASME

Jerry H. Ginsberg, George W. Woodruff Chair in Mechanical
Systems and Professor
E.Sc.D., Columbia University, 1970
Research area: Acoustics/Dynamics
Vibrations, acoustics, dynamics, and fluid-structure interaction
Fellow of ASA and ASME

Ari Glezer, George W. Woodruff Chair in Thermal Systems
and Professor
Ph.D., California Institute of Technology, 1981
Research areas: Fluid Mechanics; Heat Transfer
Fluid mechanics, turbulent shear flows, flow control, and
diagnostics
Associate Fellow of AIAA
Holds seventeen U. S. patents

James Gole, Professor of Physics (Joint Appointment)
Ph.D., Rice University, 1971
Research area: MEMS
Nanostructured materials, porous media, sensors, and
micro- and nanocaltalysis
Holds seven U. S. patents

Samuel Graham, Assistant Professor
Ph.D., Georgia Institute of Technology, 1999
Research area: MEMS
Microscale heat transfer, thermophysical properties,
nanostructured materials, nanodevices, and device reliability

Itzhak Green, Professor
Sc.D., Technion-Israel Institute of Technology, 1984
Research areas: Tribology; Acoustics/Dynamics
Hydrodynamic lubrication, vibrations, rotordynamics, fluid
sealing, design, and diagnostics
Fellow of ASME and STLE
Holds one U. S. patent

Robert E. Guldberg, Associate Professor
Ph.D., University of Michigan, 1995
Research areas: Bioengineering; Mechanics of Materials
Biomechanics, microCT imaging, and tissue engineering

Nolan E. Hertel, Professor
Ph.D., University of Illinois, 1979
Research area: Fission
Radiation shielding, neutron and computational dosimetry,
radiological assessment, accelerator sources and
applications, and high-energy particle transport

Peter J. Hesketh, Professor
Ph.D., University of Pennsylvania, 1987
Research areas: MEMS; Manufacturing
Microfabrication, micromachining, sensors, actuators,
biosensors, and microfluids
Holds six U. S. patents

Laurence J. Jacobs, Professor of Civil and Environmental
Engineering (Joint Appointment)
Ph.D., Columbia University, 1987
Research areas: Mechanics of Materials; Acoustics/Dynamics
Nondestructive evaluation, wave propagation in solids, and
experimental mechanics

Iwona M. Jasiuk,* Professor
Ph.D., Northwestern University, 1986
Research area: Mechanics of Materials
Micromechanics, elasticity, fracture, composite materials,
nano and biomaterials
Fellow of ASME
*Dr. Jasiuk resigned her position in summer 2004.

Sheldon M. Jeter, Associate Professor
Ph.D., Georgia Institute of Technology, 1979
Research area: Heat Transfer
Thermodynamics, energy systems, and heat transfer
Holds four U. S. patents

W. Steven Johnson, Professor of Materials Science and
Engineering (Joint Appointment)
Ph.D., Duke University, 1979
Research area: Mechanics of Materials
Fatigue, fracture mechanics, and durability of materials
and structures
Fellow of ASM, ASME, ASTM, and NIA

Yogendra K. Joshi, John M. McKenney and Warren D. Shiver
Distinguished Chair in Building Mechanical Systems and Associate
Chair for Graduate Studies
Ph.D., University of Pennsylvania, 1984
Research areas: Heat Transfer; MEMS
Thermofluid issues in emerging technologies and
microthermal systems
Fellow of AAAS and ASME

Jens O. M. Karlsson, Associate Professor
Ph.D., Massachusetts Institute of Technology, 1994
Research areas: Bioengineering; Heat Transfer
Thermodynamics and transport in biological systems,
nonequilibrium solidification, tissue engineering, and
bioMEMS
William King, Assistant Professor
Ph.D., Stanford University, 2002
Research areas: Heat Transfer; MEMS
Micro/nanoscale heat transfer and thermal processing,
atomic force microscopy, MEMS and micro/nanofabrication

David N. Ku, Lawrence P. Huang Endowed Chair in Engineering
and Entrepreneurship and Regents’ Professor
Ph.D., Georgia Institute of Technology, 1983
M.D., Emory University, 1984
Research areas: Bioengineering; Fluid Mechanics
Thrombosis, technology commercialization, biomaterials,
and tissue engineering
Fellow of AIMBE
Holds six U. S. patents

Thomas R. Kurfess, Professor
Ph.D., Massachusetts Institute of Technology, 1989
Research areas: Manufacturing; Automation/Mechatronics
System dynamics, control, metrology, CAD/CAM/CAE, and
precision system design
Fellow of ASME
Holds two U. S. patents

W. Jack Lackey, Professor
Ph.D., North Carolina State University, 1970
Research area: Mechanics of Materials
Nuclear fuel and waste processing, ceramic and metallic
coatings, composites, and rapid prototyping
Fellow of ACS
Holds sixteen U. S. patents

Kok-Meng Lee, Professor
Ph.D., Massachusetts Institute of Technology, 1985
Research area: Automation/Mechatronics
System dynamics, control, automation, and
optomechatronics
Holds seven U. S. patents

Marc E. Levenston, Associate Professor
Ph.D., Stanford University, 1995
Research areas: Bioengineering; Mechanics of Materials
Orthopedic biomechanics, soft tissue mechanics, and
tissue engineering

Steven Y. Liang, Professor
Ph.D., University of California, Berkeley, 1987
Research areas: Manufacturing; Automation/Mechatronics
Automated manufacturing, control systems, and digital
signal processing
Fellow of ASME
Holds one U. S. patent

Harvey Lipkin, Associate Professor
Ph.D., University of Florida, 1985
Research areas: Automation/Mechatronics; CAE/Design
Design and analysis of mechanical systems, robotics, and
spatial mechanisms
Holds two U. S. patents

Christopher S. Lynch, Associate Professor and Associate Chair
for Administration
Ph.D., University of California, Santa Barbara, 1992
Research area: Mechanics of Materials
Experimental mechanics and smart materials
Fellow of ASME

J. Robert Mahan, Academic Affairs Director of Georgia Tech
Lorraine and Professor
Ph.D., University of Kentucky, 1970
Research area: Heat Transfer
Heat transfer, thermal radiation, applied optics, and infrared
survivability of air targets

David L. McDowell, Carter N. Paden Distinguished Chair in
Metals Processing and Regents’ Professor
Ph.D., University of Illinois, 1983
Research areas: Mechanics of Materials; CAE/Design
Material deformation and damage, constitutive laws, and
metals processing
Fellow of ASME

Shreyes N. Melkote, Associate Professor
Ph.D., Michigan Technological University, 1993
Research areas: Manufacturing; Tribology
Machining processes, surfaces, intelligent fixturing, and
CAM/CAPP

Farrokh Mistree, Professor
Ph.D., University of California, Berkeley, 1974
Research areas: CAE/Design; Mechanics of Materials
Strategic design, simulation-based design of materials, and
distributed design and manufacture
Fellow of ASME and Associate Fellow of AIAA

G. Paul Neitzel, Professor
Ph.D., Johns Hopkins University, 1979
Research areas: Fluid Mechanics; Heat Transfer
Hydrodynamic stability, surface-tension-driven and rotating
flows, noncoalescence and nonwetting, and bioreactor
fluid dynamics
Fellow of AIAA, APS, and ASME

Robert M. Nerem, Parker H. Petit Distinguished Chair for
Engineering in Medicine and Institute Professor
Ph.D., Ohio State University, 1964
Research areas: Bioengineering; Fluid Mechanics
Biomechanics and cellular and tissue engineering
Fellow of AAAS, AIMBE, APS, and ASME
Honorary Fellow of IME
Member of NAE and IOM

Richard W. Neu, Associate Professor
Ph.D., University of Illinois, 1991
Research areas: Mechanics of Materials; Tribology
Fatigue, deformation, and degradation of materials

David Orloff, Professor
Ph.D., Drexel University, 1974
Research area: Heat Transfer
Impulse drying, pressing, and web preheating
Holds eight U. S. patents

John G. Papastavridis, Associate Professor
Ph.D., Purdue University, 1976
Research area: Automation/Mechatronics
Analytical, structural and nonlinear mechanics, vibrations,
and stability

Christiaan J. J. Paredis, Assistant Professor
Ph.D., Carnegie Mellon University, 1996
Research areas: CAE/Design; Automation/Mechatronics
Product life-cycle management, simulation-based design,
systems engineering, and mechatronics

David Parekh, Deputy Director of GTRI and Associate Vice
Provost for Research (Joint Appointment)
Ph.D., Stanford University, 1989
Research area: Fluid Mechanics
Active flow control, propulsion, and fuel cell systems
Holds one U. S. patent

Timothy Patterson, Assistant Professor
Ph.D., Georgia Institute of Technology, 1999
Research areas: Manufacturing; Heat Transfer
Web preheating
Holds four U. S. patents
Jianmin Qu, Professor
Ph.D., Northwestern University, 1987
Research areas: Mechanics of Materials, Acoustics/Dynamics
Fracture, composite materials, wave propagation, and microelectronic packaging
Fellow of ASME

Farzad Rahnema, Professor and Associate Chair of the Woodruff School, Chair of the Nuclear and Radiological Engineering/Medical Physics Program
Ph.D., University of California, Los Angeles, 1981
Research area: Fusion
Reactor physics, perturbation and variational methods, computational transport theory, and criticality safety
Fellow of ANS

Peter H. Rogers, Rae and Frank H. Neely Chair in Mechanical Engineering and Professor
Ph.D., Brown University, 1970
Research area: Acoustics/Dynamics
Underwater acoustics and bioacoustics
Fellow of ASA
Holds six U. S. patents

David W. Rosen, Professor
Ph.D., University of Massachusetts, 1992
Research areas: CAE/Design; Manufacturing
Virtual and rapid prototyping and intelligent CAD/CAM/CAE
Fellow of ASME

Nader Sadegh, Associate Professor
Ph.D., University of California, Berkeley, 1987
Research areas: Automation/Mechatronics; Acoustics/Dynamics
Controls, vibrations, and design
Holds one U. S. patent

Richard F. Salant, Georgia Power Distinguished Professor in Mechanical Engineering
Sc.D., Massachusetts Institute of Technology, 1967
Research area: Tribology
Fluid mechanics, fluid sealing, lubrication, and tribology
Fellow of ASME and STLE
Holds six U. S. patents

Samuel V. Shelton, Associate Professor
Ph.D., Georgia Institute of Technology, 1969
Research areas: Heat Transfer; Fluid Mechanics
Energy systems, HVAC systems, absorption, and refrigeration
Fellow of ASHRAE
Holds eight U. S. Patents

William E. Singhose, Assistant Professor
Ph.D., Massachusetts Institute of Technology, 1997
Research area: Automation/Mechatronics
Vibration, flexible dynamics, command generation, active sealing and spacecraft control
Holds one U. S. patent

Suresh Sitaraman, Professor
Ph.D., Ohio State University, 1989
Research areas: CAE/Design; Manufacturing
CAD/CAE, electronic packaging, thermomechanics and reliability, and FEM
Fellow of ASME

Marc K. Smith, Professor
Ph.D., Northwestern University, 1982
Research area: Fluid Mechanics
Hydrodynamic stability, liquid films, and droplet atomization
Holds one U. S. patent

Fotis Sotiropoulos, Associate Professor of Civil and Environmental Engineering (Joint Appointment)
Ph.D., University of Cincinnati, 1991
Research areas: Fluid Mechanics; Bioengineering
Computational fluid dynamics, turbulent shear flows, fluid mixing, biofluid mechanics, and environmental hydraulics

Weston M. Stacey, Jr., Fuller E. Callaway Professor in Nuclear Engineering and Regents’ Professor
Ph.D., Massachusetts Institute of Technology, 1966
Research area: Fusion
Fusion engineering, plasma physics, nuclear reactor physics, fusion and nuclear reactor conceptual design
Fellow of ANS and APS

Jeffrey L. Streator, Associate Professor
Ph.D., University of California, Berkeley, 1990
Research area: Tribology
Tribology, adhesion, and contact mechanics

I. Charles Um, Professor
Ph.D., University of South Carolina, 1985
Research areas: Manufacturing; Automation/Mechatronics
Electronic packaging, mechatronics, and laser moiré and laser ultrasomics
Fellow of ASME and IEEE
Holds three U. S. patents

Raymond P. Vito, Associate Dean for Academic Affairs and Professor
Ph.D., Cornell University, 1971
Research areas: Bioengineering; CAE/Design
Biomechanics, tissue mechanics, and design
Fellow of ASME
Holds five U. S. patents

C.-K. Chris Wang, Associate Professor
Ph.D., Ohio State University, 1989
Research area: Medical Physics
Radiation dosimetry, microdosimetry, biophysical modeling of radiation effects, and neutron therapies for cancer treatment

William J. Wepfer, Vice Provost for Distance Learning and Professional Education and Professor
Ph.D., University of Wisconsin, 1979
Research area: Heat Transfer
Heat transfer, energy systems, and fuel cells
Fellow of ASHRAE and ASME

Timothy M. Wick, Professor of Chemical and Biomolecular Engineering (Joint Appointment)
Ph.D., Rice University, 1988
Research areas: Bioengineering; Fluid Mechanics
Tissue and bioprocess engineering, bioreactor design, cell adhesion, and blood rheology

Ward O. Winer, Eugene C. Gwaltney, Jr. Chair of the Woodruff School and Regents’ Professor
Ph.D., Cambridge University, 1964
Ph.D., University of Michigan, 1961
Research areas: Tribology; Fluid Mechanics
High-pressure rheology, lubrication, tribology, thermomechanics, and mechanical systems diagnostics
Fellow of AAS, ASEE, ASME, and STLE
Member of NAE

Wenjing Ye, Assistant Professor
Ph.D., Cornell University, 1998
Research areas: MEMS; Mechanics of Materials
CAD design of MEMS, hybrid continuum and atomistic modeling, and numerical analysis
Minami Yoda, Associate Professor
Ph.D., Stanford University, 1993
Research areas: Fluid Mechanics; Heat Transfer
Experimental fluid mechanics, suspension flows, nano- and microfluids, and optical diagnostics

Ajit P. Yoganathan, Regents’ Professor (Joint Appointment)
Ph.D., California Institute of Technology, 1978
Research areas: Bioengineering; Fluid Mechanics
Cardiovascular fluid dynamics, rheology, Doppler ultrasound, and MRI
Fellow of AIMBE

Zhuomin Zhang, Associate Professor
Ph.D., Massachusetts Institute of Technology, 1992
Research areas: Heat Transfer; MEMS
Micro/nano-scale heat transfer, radiative properties of thin films, light scattering from rough surfaces
Holds two U. S. patents

Min Zhou, Associate Professor
Ph.D., Brown University, 1993
Research areas: Mechanics of Materials; Manufacturing
Micro- and nano-scale behavior, continuum and molecular dynamics modeling, experimental/computational mechanics, dynamic behavior, and fracture

Cheng Zhu, Professor
Ph.D., Columbia University, 1988
Research area: Bioengineering
Biomechanics of single cells and single molecules, cell adhesion kinetics, and bio-MEMS

Ben T. Zinn, David S. Lewis Chair of Aerospace Engineering and Regents’ Professor (Joint Appointment)
Ph.D., Princeton University, 1965
Research areas: Heat Transfer; Acoustics/Dynamics
Combustion instability, active control, microscale combustion, propulsion, and acoustics
Fellow of AIAA and ASME
Member of NAE
Holds nine U. S. patents

Research Faculty (as of fall 2004)

Janet Allen, Senior Research Scientist
Ph.D., University of California, Berkeley, 1973
Research area: CAE/Design
Design evolution over time, modeling uncertainty, decision-based design, and design pedagogy
Fellow of AHA and CoA Associate Fellow

Scott S. Bair, Principal Research Engineer
Ph.D., Georgia Institute of Technology, 1990
Research area: Tribology
Tribology, rheology, properties of liquids at high pressure, and machine design
Fellow of ASME
Holds eleven U. S. patents

Van B. Biesel, Research Engineer II
M.S., Georgia Institute of Technology, 1993
Research area: Acoustics/Dynamics
Acoustics, vibrations, noise control, numerical modeling, transducers, and piezoelectric materials

John R. Bogle, Senior Research Engineer
M.S., Georgia Institute of Technology, 1987
Research area: Acoustics/Dynamics
Structural acoustics, finite/boundary element modeling interaction of underwater sound and structures, and vibrations

Tom Crittenden, Research Engineer II
Ph.D., Georgia Institute of Technology, 2003
Research areas: Heat Transfer; Fluid Mechanics
Flow control, fluidic actuation techniques, small-scale combustion, and MEMS-based actuators
Holds one U. S. patent

John R. Culp, Research Engineer II
B.S., Georgia Institute of Technology, 2000
Research area: Fluid Mechanics
Fluidic actuators and technologies, computer-based data acquisition, fluid flow fields, and electronic components

François M. Guillot, Research Engineer II
Ph.D., Georgia Institute of Technology, 2000
Research area: Acoustics/Dynamics
Acoustic material characterization, measurement methodology, laser Doppler vibrometry, electromechanical transduction, and structural acoustics

Steven R. Hahn, Research Engineer II
M.S., Georgia Institute of Technology, 1988
Research area: Acoustics/Dynamics
Structural acoustics, vibrations and control, and finite- and boundary element techniques
Holds one U. S. patent

Sam Heffington, Research Engineer II
Ph.D., Georgia Institute of Technology, 2001
Research areas: Heat Transfer; Fluid Mechanics
Thermal management of electronic packages, spray cooling, boiling enhancement, and two-phase flows

James Huggins, Research Engineer II
M.S.M.E., Georgia Institute of Technology, 1988
Research area: Automation/Mechatronics
Hydraulic and pneumatic motion controls

Gregg D. Larson, Senior Research Engineer
Ph.D., Georgia Institute of Technology, 1996
Research area: Acoustics/Dynamics
Transduction, acoustics, vibrations, and piezoelectric ceramics
Holds one U. S. patent

Academic Professionals

Jeffrey A. Donnell, Coordinator of the Frank K. Webb Program in Professional Communication
Ph.D. English, Emory University, 1990

Kristi Lewis, Undergraduate Academic Advisor
M.S., Clemson University, 2000

David Sanborn, Associate Chair for Undergraduate Studies
Ph.D., University of Michigan, 1969
Design, thermodynamics, and combustion
Fellow of ASME
Holds four U. S. patents

Michael D. Stewart
M.S., Wayne State University, 1983
Engineering design graphics, computer-aided design, advanced feature-based parametric solid modeling, and rapid prototyping

Wayne Whiteman, Director of the Office of Student Services
Ph.D., Georgia Institute of Technology, 1996
Research area: Acoustics/Dynamics
Vibrations, structural dynamics, nonlinear dynamics, and engineering education
Angela Lin, Research Engineer I  
M.S., Georgia Institute of Technology, 2002  
Research area: Bioengineering

Raghav Mahalingam, Research Engineer II  
Ph.D., Georgia Institute of Technology, 1999  
Research areas: Fluid Mechanics; Heat Transfer  
Thermal management in microelectronics, vortex dynamics, unsteady aerodynamics, rotorcraft aeromechanics and active flow control  
Holds one U.S. patent

John Mandrekas, Senior Research Scientist  
Ph.D., University of Illinois, 1987  
Research area: Fusion  
Plasma physics, transport theory, fusion reactor design, numerical methods, and computational physics

James S. Martin, Senior Research Engineer  
M.S., Georgia Institute of Technology, 1994  
Research area: Acoustics/Dynamics  
Shallow water sound propagation, internal gravity waves, structural acoustics, bioacoustics/biomimetics, nondestructive testing, and nonlinear bubble dynamics

Dennis L. Sadowski, Research Engineer II  
M.S., University of Illinois, 1986  
Research area: Heat Transfer  
Thermal sciences, fluid dynamics, and design and construction of experimental equipment  
Holds three U.S. patents

Reza Sadr, Research Engineer II  
Ph.D., University of Utah, 2002  
Research area: Heat Transfer  
Microfluid mechanics, two-phase flow, and boundary layer flow

Dave Trivett, Principal Research Scientist  
Research area: Acoustics/Dynamics  
Structural acoustics, measurement methodology, transduction mechanisms, acoustic materials, and sonar systems

Bojan Vukasinovic, Research Engineer II  
Ph.D., Georgia Institute of Technology, 2002  
Research areas: Fluid Mechanics; Heat Transfer  
Flow diagnostics and control, shear layer flows, liquid breakup and atomization, sprays, and thermal management

Jelena Vukasinovic, Research Engineer II  
M.S., Georgia Institute of Technology, 2000  
Research areas: Fluid Mechanics; Heat Transfer  
Thermal management in electronics packaging, evolution and interaction in synthetic jet arrays, fluidic-based forced convection heat transfer, vortex dynamics in rotating flows, optical diagnostics

Xuezhen Zhang, Research Scientist II  
Department of Physics of Nanjing University  
Majored in Physics (3.5 years), and Acoustics (1.5 years), 1958-1963  
Research area: Acoustics/Dynamics  
Computational and shallow water acoustics

Ji-Xun Zhou, Principal Research Scientist  
Graduate School of the Chinese Academy of Sciences  
Majored in Ocean Acoustics, 1963-1967  
Research area: Acoustics/Dynamics  
Shallow water acoustics, sound propagation and reverberation, acoustic interactions with internal waves, seafloor acoustics, and acoustic remote sensing

Part-Time Appointments

L Dennis Ballou, Instructor  
J.D. Law, University of Georgia, 1977  
Elastic instability of cylindrical shells and availability analysis

Barbara McCord, Instructor  
Ph.D., Georgia Institute of Technology, 1992  
Two-phase heat transfer and bioengineering

Emeritus Faculty

Samuel C. Barnett, started in 1946, retired in 1980  
William Z. Black, started in 1967, retired in 2000  
Melvin W. Carter, started in 1972, retired in 1988; Member of NAE  
Joseph D. Clement, started in 1965, retired in 1991  
Gene T. Colwell, started in 1966, retired in 1995  
Monte V. Davis, started in 1973, retired in 1987  
Prateen V. Desai, started in 1966, retired in 2002  
Stephen L. Dickerson, started in 1965, retired in 1996; holds two U.S. patents  
Pandeli Durbetaki, started in 1964, retired in 1995  
Geoffrey G. Eichholz, started in 1963, retired in 1988  
James G. Hartley, started in 1977, retired in 2003  
Jacek Jarzynski, started in 1986, retired in 2001; holds two U.S. patents  
Bernd Kahn, started in 1974, retired in 1996  
Ratib Karam, started in 1972, retired in 1997  
S. Peter Kezios, started in 1967, retired in 1990  
Alfred Schneider, started in 1975, retired in 1990

Promotions

Ye-Hwa Chen, David Rosen, Suresh Sitaraman, and Marc Smith were promoted to full professor. Imme Ebert-Uphoff, Andres Garcia, and Marc Levenston were promoted to associate professor with tenure. Peter Hesketh was granted tenure.
Retirement

James G. Hartley was on the faculty of the Woodruff for 26 years; he retired in August 2003.

Recognitions

Van Biesele was recognized with a Georgia Tech Ten-Year Service Award.
Levent Degertekin received a National Science Foundation Faculty Early Career Development Award for Quantitative Ultrasonic Atomic Force Microscopy of Thin Films and Subsurface Interfaces. Levent is the 24th faculty member in the Woodruff School to receive an NSF career or young investigator award. Twelve Ph.D. alumni of the Woodruff School who hold faculty positions in other institutions have also received awards.
Steve Dickerson was appointed to the Georgia Tech Alumni Association Board of Trustees.
Imme Ebert-Uphoff and some of her students received the Best Video Award at the 2004 IEEE International Conference on Robotics and Automation.
Andrei Fedorov received the Young Faculty Award from the Georgia Tech Chapter of Sigma Xi.
Andrés García received the Society of Biomaterials 2004 Career or Young Investigator Award.

Sam Graham is one of three Georgia Tech graduates who received a grant to help new Ph.D. graduates jump start their academic careers. The grants were awarded by FACES, a Georgia Tech program supported by the National Science Foundation that is designed to groom minority students for careers in academia. Sam also received the 2004 M. Eugene Merchant Outstanding Young Manufacturing Engineer Award from SME International.
Itzhak Green received the Frank P. Busick Award from the Society of Tribologists and Lubrication Engineers for the best paper in sealing technology for 2003.
Robert Guldberg was appointed Associate Director of the Petit Institute for Bioengineering and Bioscience.
Nolan Hertel was appointed to the U.S. Scientific Review Group of the Russian Health Studies Program. Two Georgia Tech alumni, John Poston (Ph.D. NE/HP 1971) and Mike Ryan (Ph.D. NE/HP 1982) also serve on the committee. He also received the Glenn Murphy Award from the Nuclear Engineering Division of the ASEE.
Sheldon Jeter was recognized with a Georgia Tech Twenty-Five Year Service Award.
Steve Johnson was recognized with a Georgia Tech Ten-Year Service Award.
Marc Levenston was one of two recipients at Georgia Tech of the Lockheed Martin Corporation Dean’s Award for Teaching Excellence.
Steven Liang was elected President of the North American Manufacturing Research Institute.
Shreyes Melkote, and former student Jose Hurtado (M.S.M.E. 1998, Ph.D ME 2001) received the 2004 Blackall Machine Tool and Gage Award from the ASME for their paper published in the Journal of Manufacturing Science and Engineering. The award is for the best paper concerned with the design or application of machine tools, gages, or dimensional instruments.
John Papastavridis’s book, Analytical Mechanics, was named an outstanding professional and scholarly 2002 title in engineering by the Association of American Publishers. Also, he was recognized with a Georgia Tech Twenty-Five Year Service Award.
Richard Salant received the 2003 Machine Design Award from the ASME.
William Singhose won the Educational Partnership Award for Faculty at the Georgia Tech Faculty Honors Luncheon.
Charles Ume was one of three recipients of the Nigerian National Order of Merit for 2003. Fewer than 20 awards have been given since the award was established in 1979. Charles is the first recipient living and working outside Nigeria. He also received the 2004 Robert G. Quinn Award from the American Society for Engineering Education in recognition of distinguished accomplishments.
William Wepfer was named a member of the Pennsylvania State University (Mechanical and Nuclear Engineering Department) Industrial and Professional Advisory Committee.
Wayne Whitman received one of the two awards for the 2004 Georgia Tech Women in Engineering Program Engineering Faculty Award for excellence in teaching, caring, and motivation that has made a difference in students’ lives. Nominations for this award can only be made by women engineering students. Marc Levenston was also nominated for this award.
Timothy Wick was appointed Chair for the Bioengineering Multidisciplinary Degree Program.
Agit Yoganathan was recognized with a Georgia Tech Twenty-Five Year Service Award.
Cheng Zhu received the Best Faculty Paper Award from the Georgia Tech Chapter of Sigma Xi.
Min Zhou was recognized with a Faculty Best Paper Award from the Georgia Tech Chapter of Sigma Xi.
Ben Zinn was chosen as the 2005 International Gas Turbine Institute Scholar.

Fellows

The following faculty members were elected to the grade of Fellow in a professional society in the past academic year:
Jonathan Colton was elected a Fellow in the Society of Plastic Engineers.
Steve Dickerson was made a Fellow of the Society of Manufacturing Engineers.
Srinivas Garimella is a Woodruff School Faculty Fellow.
Robert Guldberg is now a Woodruff School Faculty Fellow.
Iwona Jasiuk was elected to the grade of Fellow in the American Nuclear Society.
W. Steven Johnson was made a Fellow of the National Institute of Aerospace and of the ASME.
Yogendra Joshi was elected to the grade of Fellow in the American Association for the Advancement of Science.
Tom Kurfess was elected a Fellow of the ASME.
Christopher Lynch was elected a Fellow of the ASME.
Farzad Rahnerma was elected to the grade of Fellow in the American Nuclear Society.
Suresh Sitaraman was elected a Fellow of the ASME.
Charles Ume was elected to the grade of Fellow in the Institute of Electrical and Electronics Engineers.
Ward Winer was elected to the grade of Fellow in the American Society for Engineering Education. Only three other individuals at Georgia Tech have been fellows of the society during its entire history.
Min Zhou is a Woodruff School Faculty Fellow.
Joshi Named to New Distinguished Chair

Dr. Yogendra Joshi was named to the John M. McKenney and Warren D. Shiver Distinguished Chair in Building Mechanical Systems. He came to Georgia Tech in 2001 as a Professor of Mechanical Engineering. In 2003 he became the Associate Chair for Graduate Studies. Prior to coming to Georgia Tech, he was on the faculty of the University of Maryland at College Park.

Professor Joshi received a B. Tech. from Indian Institute of Technology in Kanpur, India in 1979, an M.S. from the State University of New York at Buffalo in 1981, and a Ph.D. from the University of Pennsylvania in 1984.

Professor Joshi's research deals with transport processes associated with emerging technologies, including energy management of large installations of electronic equipment, such as data centers and advanced thermal systems in heating, ventilation, and air conditioning in buildings. He is the author or coauthor of more than one-hundred-and-forty journal articles and conference papers.

Professor Joshi is a Fellow of the American Society of Mechanical Engineers and the American Association for the Advancement of Science. He shared a Curriculum Innovation Award from the Semiconductor Research Corporation in 2001.

About the Chair

The McKenney/Shiver Chair is named for two distinguished and highly respected men in the building systems industry, both graduates of Georgia Tech. John M. McKenney (COM 1932) founded McKenney's Inc., a leading mechanical contracting firm, in 1948. The firm is still family owned and managed. McKenney's employs more than thirty-five Tech graduates and is one of Georgia Tech's largest co-op employers. John was known for his high ethical standards, a genuine concern for his employees, and a dedication to providing quality work for his clients.

Warren D. Shiver (BME 1964, MSME 1966) was associated with Newcomb & Boyd for almost forty years. He was the lead engineer on more than 1600 building mechanical systems projects; some are Atlanta landmarks. He was an outstanding engineer, a dedicated community leader, and served Georgia Tech in many capacities, including the Woodruff School Advisory Board and the Georgia Tech Alumni Association Board of Trustees.

We Remember

Robert Fulton, Professor of Mechanical Engineering and Fulton County Commissioner, died on February 24, 2004 in his home. Dr. Fulton came to Georgia Tech in fall 1985 as a professor; prior to that, he was a senior staff scientist at George Washington University. His research at Georgia Tech included the development of methods and tools associated with the application of new and evolving information technology concepts to improve the analysis, design, manufacture, and life-cycle support of complex engineering products.

Dr. Fulton was the 2002 recipient of the Jack M. Zeigler (BME 1948) Outstanding Educator Award, where he was recognized for nurturing the Woodruff School research and education program in computer-aided engineering and design; the initiation and development of the undergraduate program in computer-aided design and the graduate program in computer-aided engineering and information technology; and leadership in the expansion of information technology education within the College of Engineering.

Dr. Fulton was a Fellow of the ASME, an Associate Fellow of the AIAA, and a registered Professional Engineer in Illinois. In 2003 he was named the Engineers of Greater Atlanta Engineer of the Year in Education.

Dr. Fulton was elected to the Fulton County Commission in 1994, representing upper Sandy Springs to the northern end of the county. He served on the Alpharetta Zoning Board of Appeals, was a member of the Atlanta-Fulton Water Resources Commission, and the Atlanta-Fulton Public Library Board of Trustees. He was interested in parks, greenspace, and the arts. The new northwest Fulton County library is named after him.

Jim Brazell, who passed away in December 2003, taught in the Woodruff School from 1971 until 1996. He held 14 patents and often served as an expert witness in product liability cases. Dr. Brazell taught senior design. In 1995 his design class won NASA’s national competition for the design of a moon buggy. His outside interests were blacksmithing and wood working; he made tools so that he could make oak furniture without using power tools.
### STAFF

Of the 49 current staff members, 33 are females and 16 are males.

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
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<tbody>
<tr>
<td>Segried Allen</td>
<td>Administrative Assistant I</td>
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<tr>
<td>Trudy Allen</td>
<td>Academic Assistant II</td>
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<tr>
<td>Shauna Bennett-Boyd</td>
<td>Administrative Assistant II</td>
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<tr>
<td>Vladimir Bortkevich</td>
<td>Electrical Engineer III</td>
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<tr>
<td>Lindsey Bryant</td>
<td>Research Technician III</td>
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<tr>
<td>Donald F. (Butch) Cabe</td>
<td>Manager of Facilities</td>
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<tr>
<td>Robert Cooper</td>
<td>Mechanical Technician III</td>
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<tr>
<td>Phillip R. Coulson</td>
<td>Financial Specialist</td>
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<tr>
<td>Andrew G. (Drew) Davis</td>
<td>Electronics Specialist</td>
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<tr>
<td>Judith E. Diamond</td>
<td>Administrative Assistant II</td>
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<tr>
<td>Dimetra Diggs-Butler</td>
<td>Administrative Assistant I</td>
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<tr>
<td>Kenneth Dollar</td>
<td>Director of Support and Technical Services</td>
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<td></td>
<td>Computer Services Specialist III</td>
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<td>Administrative Manager I</td>
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<td>Academic Advisor I</td>
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<td>Electrical Engineer II</td>
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<td>Administrative Supervisory II</td>
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<td>Director of Communications</td>
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<td>Machine Shop Manager</td>
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<td>Financial Manager I</td>
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<td></td>
<td>Manager of Computing, Networking &amp; Electronics</td>
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<td>Clerk IV</td>
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<td></td>
<td>Systems Analyst III</td>
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<td>Systems Analyst III</td>
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<td>Facilities and Laboratory Coordinator</td>
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<td>Administrative Assistant II</td>
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<td></td>
<td>Accountant III</td>
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<tr>
<td></td>
<td>Director of Instruction Labs</td>
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<td></td>
<td>Administrative Assistant I</td>
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<td>Director of Finance</td>
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<td>Administrative Assistant II</td>
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<td></td>
<td>Administrative Coordinator</td>
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<td></td>
<td>Director of Development</td>
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</tbody>
</table>

### Honors

At the end of each semester, nominations from any employee of the Woodruff School are received for the Woodruff School Outstanding Achievement Award for any staff person who has performed in an exceptional manner during that term. A volunteer committee of staff members selects the winner. Nancy Hutton won in summer 2003 and Cary Ogletree won in fall 2003. No nominations were received in spring 2004. **Nancy Hutton** received the Outstanding Achievement Award for Classified Staff for the past academic year. **Judy Diamond, Lisa Manning, and David Stone** were recognized with a Georgia Tech Ten-Year Service Award at the Faculty/Staff Awards Luncheon. **Cary Ogletree** was promoted to Administrative Manager I.

### FACILITIES

The Atlanta campus of the Georgia Institute of Technology contains 197 buildings, including 72 for academic instruction and research, and 12 for academic support. The remaining buildings by principal use are for athletics, campus support, parking, residential, Georgia Tech Research Institute, and student support. The Woodruff School has the use of the following buildings:

**J. Erskine Love Jr. Manufacturing Building**
- Opened in 2000
- Underwater acoustics tank, wind tunnel, and MEMS clean room are special facilities
- Building is shared with Materials Science and Engineering
- Acoustics and Dynamics; Fluid Mechanics; Heat Transfer, Combustion and Energy Systems; and MEMS are research groups in this building
Manufacturing Related Disciplines Complex
- Opened in 1995
- Academic, Administrative, and Finance Offices located here
- Undergraduate laboratories are among the special facilities
- Tribology and Mechanics of Materials are research groups in this building
- Building is shared with Polymer, Textile, and Fiber Engineering

Fuller E. Callaway, Jr. Manufacturing Research Center
- Opened in 1991
- Integrated Acoustics Laboratory (anechoic-chamber) and High-Bay Area are special facilities
- CAE and Design, Manufacturing, and Automation and Mechatronics faculty research groups are housed here

Frank H. Neely Nuclear Research Center
- Opened in 1963
- Nuclear and Radiological Engineering/Medical Physics program is housed here
- Research groups: fission, fusion, and medical physics
- Fusion Research Center (Stacey) and Neely Nuclear Research Center (Hertel) housed here.

Parker H. Petit Biotechnology Building
- Opened in 1999
- Bioengineering research group is located here.

IPST Centennial Engineering Building
- Opened in 1997
- Faculty members in Paper Science and Engineering are housed here.

Institute of Paper Science and Technology
- Opened in 1992
- Houses two laboratories for faculty members in the Heat Transfer research group.

Student Competition Center (The Tin Building)
- Opened in 1941
- Officially the Mechanical Engineering Research Building
- Houses various student competition groups, including gt motorsports, GT Off-Road (the mini-baja team), RoboJackets/FIRST, and Solar Jackets

ALUMNI

We Remember
Ralph W. Pries (BME 1940), the Woodruff School’s Distinguished Alumnus in 2002, passed away in November. He was 84.
Mr. Pries was the retired chief executive of a food company and a medical supply company who raised thousands of dollars for handicapped children through the Variety Clubs.
Mr. Pries grew up in Atlanta. After earning his B.M.E. he worked in San Francisco for the National Theatre Supply Co.
Mr. Pries was on the boards of a number of hospitals. He was president of the Georgia Tech Club of Philadelphia.
College of Engineering Awards
Alumni were selected for the Georgia Tech Council of Outstanding Young Engineering Alumni. Membership in the Council is reserved for alumni under 40 years of age who have demonstrated outstanding professional achievements. They are: Brett E. Battles (BME 1984, MSME 1987), General Partner in Aberdare Ventures; and Robert T. Coneybeer (MSME 1992), Venture Partner in New Enterprise Associates.

The Academy of Distinguished Engineering Alumni recognizes alumni who have made significant contributions to their profession, the Institute, or society-at-large. Individuals receiving this award are widely respected, recognized for their professional and personal services, and actively involved in engineering or management. They bring distinction to Georgia Tech. Our inductees are: Sherri Beakowski (BME 1980), the General Manager of Microsoft Corporation's Education Solutions Group and Robert V. Geiger (Ph.D. ME 1991), Chief Information Officer of NuBridges.

The highest honor that can be bestowed on alumni in the College of Engineering is the Hall of Fame. The inductees are: Jack Clearman (BME 1946), retired Director of Advanced Development at Whirlpool Corporation, Dean Lennard (BME 1953), retired General Manager of the CF6 Engine Projects Department at GE Aircraft Engines, and Frank Davis Lewis Sr. (BME 1943, MSME 1959), retired Functional Subsystem Design Specialist at Lockheed Georgia Company.

Other Alumni Awards
Saniya Ashan (BSME 2003) won a National Science Foundation Graduate Research Fellowship. She spent the past academic year at Cambridge University on a Churchill Fellowship.

Tim Lieuwen (Ph.D. ME 1999) received a Young Faculty Award from the Georgia Tech Chapter of Sigma Xi. Tim is an assistant professor of Aeronautical Engineering at Georgia Tech.

Calvin Mackie (BME 1990, MSME 1992, Ph.D. ME 1996), Associate Professor of Mechanical Engineering at Tulane University, was among nine individuals and eight institutions President Bush honored with the 2003 Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring. This yearly award recognizes people and institutions that have provided opportunities for women, minorities, and disabled persons in science, mathematics and engineering at the elementary, secondary and university levels.

Erika Parra (BSME 2003) won a National Science Foundation Graduate Research Fellowship. She attends graduate school at Berkeley.

Laura Schaefer (Ph.D. ME 2000) won a National Science Foundation Faculty Early Career Award. She is an Assistant Professor at the University of Pittsburgh.

Nicole Zirkleback (Ph.D. ME 2001) was one of four Lockheed Martin Aeronautics employees honored with national technical awards. Nicole, an engineer on the C-5 Avionics Modernization Program in Marietta, Georgia, was named Most Promising Engineer in the Advanced Degree category of the Hispanic Engineer National Achievement Awards.

DONORS
This list includes donors who have designated gifts to the Woodruff School of Mechanical Engineering between July 1, 2003 and June 30, 2004.

Alumni and Friends
Jill W. Adams, Friend
Thomas E. Bragg, Jr., EE 1997
Stephanie Breslin, Friend
Debra J. Brook, Friend
Kenneth W. Brooks, Ph.D., ME 1993
William S. Bulga, ME 1970
Robert John Butera, EE 1991
Chaz Cone, Jr, IM 1961
Henry P. Cotton, ME 1968
Steve Cseplo, Friend
Leslie A. DelGrosso
Scott H. Downs, Friend
Barbara Eschenbach
Edward A. Eppinger, ME 1960
Rafael J. Fanjul, Jr., EE 1986
Vicki J. Fennemeyer, Friend
Anthony M. Godfrey, ME 1999
Mr. and Mrs. Paul Hammel, Friend
Don S. Hamer, Friend
James M. Hawkins, Friend
Dana W. Hesse, Friend
Lawrence P. Huang, BMGT 1973
Thomas M. Hudson, Jr., ME 1973
Sheldon M. Jeter, Ph.D., ME 1979
J. Alan Kennedy, ME 1995
Artene Kurtis, Friend
James C. Leathers, ME 1955
Dean J. Lennard, ME 1953
David F. Lynn, Friend
Helen K. Maddox, Friend
Henry F. McCamish, Jr., IM 1950
Stella M. Meyer, Friend
Isaac E. Murray, Jr., ME 1949
Richard J. Protus, EE 1998
Henry L. Pruitt, ME 1951
Joan and Ronald E. Ohi
Joseph L. Smith, Jr., ME 1952
Weston M. Stacey, PhYS 1959
Phillip J. Sullivan, AE 1955
Jason B. Taylor, ME 2003
William L. Thacker, Jr., ME 1967
Frank N. Tran, Friend
John E. Quicksall, Friend
Mark S. Popp, Friend
Frank K. Webb, ME 1938
Wayne Whiteman, ME Ph.D. 1997
Scott C. Williams, Friend
Wendell M. Williams, Jr., ME 1955
Carlos D. Wilson, Friend
Yucung Wang, Friend
Jack M. Zeigler, ME 1948

Corporations, Foundations and Organizations
Air Products and Chemicals, Inc.
Altea Therapeutics
American Society of Mechanical Engineering
American Standard Foundation
ARCS Foundation, Inc.
Arpeggio Acoustic Consulting LLC
Arias Pistons
Ashland, Inc.
ASHRAE
Baker Hughes Incorporated
Bank of America Foundation
Boeing Company
BP America
CH2M HILL Foundation
ChevronTexaco Corporation
The Clorox Company
CoreStates Bank
Creative Craftsman, Inc.
Cummins Business Services
Engelhard Corporation
ESAI Corporation
ExxonMobil Corporation
The Fluor Foundation
Flowservice Corporation
Ford Motor Company
The Foundation of Roanoke Valley
Framatome Technologies, Inc.
GE Foundation
General Motors Corporation
General Motors Foundation
Gulf Power Foundation
Herbert & Marian Haley Foundation
Hitachi, Ltd
Honda Manufacturing of Alabama LLC
Industrial Coatings Alliance Group
John Deere Foundation
Kimberly-Clark Corporation
Levenson Foundation Inc.
Lockheed Martin Corporation
Michelin North America
Milliken & Company, Inc.
Modine Manufacturing Company
National Instruments
Parametric Technology Corporation
Perkins Scientific, Inc.
Pi Tau Sigma
Porex Technologies Corp. of Georgia
Procter & Gamble Fund
Raytheon Company
RLFJR Enterprises, Inc.
Rolls-Royce Allison SAMEER
Scientific-Atlanta Foundation, Inc.
Sealed Air Corporation
Shaw Industries, Inc.
Shell Oil Company
Society of Automotive Engineers, Inc.
Society for Cryobiology
Suwanee Dental Center, LLC
The Timken Company
Toyota Motor Manufacturing University of Warwick
Varian Medical Systems

Faculty, Staff and Students
Janet K. Allen, Ph.D.
Wayne J. Book, Ph.D
Gene T. Colwell, Ph.D.
Professor Emeritus
Kenneth A. Cunefare, Ph.D.
Stephen L. Dickerson, Ph.D.
Thomas K. Gaylord, Ph.D.
Nolan E. Hertel, Ph.D.
Sheldon M. Jeter, Ph.D., ME 1979
Matthew K. Madison, Student
Lora L. Magnuson, Staff
William J. Miller, Staff
Robert M. Nerem, Ph.D.
Jiamin Qu, Ph.D.
Farzad Rahnejna, Ph.D.
Richard F. Salant, Ph.D.
Weston M. Stacey, PhYS 1959
William J. Wegler, Ph.D.
Wayne Whiteman, Ph.D., ME 1997
Albert Whitesides IV, Student
Wendell M. Williams, Jr., ME 1955, Retired Facility
Wayne Whiteman, Ph.D.
Caroline G. Wood, Staff
FINANCES

For fiscal year 2004 (July 1, 2003 to June 30, 2004), the Woodruff School’s finances were reflected in the number of grants and contracts received from external sources, the budget of the School (state support), and the revenue generated from the Woodruff Endowment. Detailed information on any of these categories is available from the Woodruff School’s Director of Finance, David Stone, at (404) 894-7400.

Number of Grants, Contracts, and Proposals

<table>
<thead>
<tr>
<th>Description</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of active (external/internal) grants and contracts (includes endowment accounts)</td>
<td>505</td>
</tr>
<tr>
<td>Number of proposals submitted to external agencies</td>
<td>208</td>
</tr>
<tr>
<td>Number of externally funded grants, contracts, and endowments receiving new funds</td>
<td>237</td>
</tr>
<tr>
<td>Number of internally funded grants receiving new funds</td>
<td>18</td>
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School Budget FY04, k$

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>State support</td>
<td>$13,688</td>
</tr>
<tr>
<td>Total grant, contract, and endowment expenditures a</td>
<td>$23,450</td>
</tr>
<tr>
<td><strong>Total budget</strong></td>
<td><strong>$37,138</strong></td>
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Endowments (as of July 1, 2003), k$

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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<tr>
<td>Total Woodruff School endowments (market value principal)</td>
<td>$72,727</td>
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<tr>
<td>Endowment-generated revenue available for expenditure</td>
<td>$3,400</td>
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a Includes direct costs, fringe benefits, and overhead, if applicable.

THE WOODRUFF ENDOWMENT

Funds from the George W. Woodruff Trust continue to provide for the enhancement of the School of Mechanical Engineering. George W. Woodruff (class of 1917) served as a trustee and trustee emeritus of the Georgia Tech Foundation from 1941 until his death at the age of 91 in 1987, and he received the Alumni Distinguished Service Award in 1963. In addition to providing a significant endowment for the School of Mechanical Engineering, his contributions to Georgia Tech provide National Merit Scholarships and scholarships for student athletes in nonrevenue producing sports and are an ongoing source of unrestricted support for the Institute.

The market value of the Mechanical Engineering Woodruff Endowment on July 1, 2003 was $52,701,320. The endowment generated $2,463,931 that was available to the Woodruff School to update and enrich our programs during fiscal year 2004. The expenditures fall into these categories: faculty, students, facilities, lectures and seminars, staff, publications, and general projects and supplies.

Faculty

- Funds from the Woodruff Trust are used to endow the George W. Woodruff Chair in Mechanical Systems and the George W. Woodruff Chair in Thermal Systems. Dr. Jerry H. Ginsberg, Professor of Mechanical Engineering, has held the Mechanical Systems Chair since 1989. Dr. Ari Glezer, Professor of Mechanical Engineering, was appointed to the Thermal Systems Chair in 2002.
- Funds travel and equipment purchases for faculty.
- Funds the Woodruff Faculty Fellows Program, which encourages young professors to build their careers at Georgia Tech by providing seed money for research projects and other discretionary activities. The award is given for a five-year period. Bert Bras, Srinivas Garimella, Robert Guldberg, David Rosen, and Min Zhou are faculty fellows.
- Partially supports the School’s participation in the Georgia Tech Lorraine Program in Metz, France.
- Partially supports the Frank K. Webb Program in Professional Communication and the hiring of academic professionals and part-time faculty to supplement the course offerings of the School.
- Funds faculty recruiting.

Students

- The largest single category of support is for students ($1,444,746) in the form of teaching assistantships, research assistantships, fellowships, and fees to outstanding students, amounting to approximately 216 student-semesters of support.
- Provides funds, including travel, to recruit new ME, NRE, and MP graduate students to the Woodruff School. This includes three recruiting weekends in which potential graduate students are brought to campus for a weekend of activities.
• Funds the Annual Spring Banquet, a yearly gathering of students, faculty, and staff to recognize the accomplishments of Woodruff School students and to honor the Woodruff School’s Annual Distinguished Alumnus and the Outstanding Educator.
• Partially funds student organizations such as the ASME Student Chapter, gt motorsports, GT Off-Road (the Mini-Baja Team), GT Robojackets (including the FIRST team), Future Truck, Solar Jackets, and WSSAC.
• Provides partial financial support for student participants in the Georgia Tech Lorraine program.
• Provides funds for the Annual Outstanding Seniors Dinner. The purpose of this annual dinner is to encourage Woodruff School seniors with a grade point average of 3.5 and above to go to graduate school.
• Funds luncheon meetings between the Woodruff School administration and graduate students and a sampling of graduating undergraduates to obtain students’ assessment of our programs.
• Funds an Open House and other activities in the Woodruff School during Family Weekend.
• Supports the Woodruff School Annual Cookout, held at the beginning of the fall semester, where new graduate students can meet Woodruff School faculty, staff, and returning graduate students.
• Provides plaques and funds for students who receive an award at the annual Student Honor’s Day Luncheon.
• Partial support for the Pi Tau Sigma National Office, the honorary mechanical engineering society that the school hosts.
• Helps fund recruiting efforts for undergraduate students in nuclear and radiological engineering.

Facilities
• Helps fund the operation of the Student Competition Center (the Tin Building).
• Partial funds for furniture for the Mechatronics Lab.
• Funds for the relocation, renovation, and establishment of labs for new faculty, such as Srinivas Garimella’s Sustainable Thermal Systems Laboratory.
• Provides funds to improve and furnish School facilities, including computer cluster and networking equipment.
• Provides funds to upgrade Woodruff School security equipment.

Lectures and Seminars
• Provides support for the Woodruff Colloquium Series. These funds allow the Woodruff School to bring in well-known scholars to present a seminar and interact with the faculty in small groups.
• Pays for receptions that accompany various seminars in the Woodruff School.

Publications and Public Relations
• Funds the design, production, and distribution of all Woodruff School publications.

Miscellaneous Projects
• Provides funds for the Woodruff School Advisory Board meetings.
• Supports the purchase of gifts for lecturers, special guests, and retirees.
• Funds various retirement and other special receptions for faculty and staff.

Special Projects
• Funds to improve office equipment and upgrade computers.
• Funded an exhibition booth at the American Society of Mechanical Engineers (ASME) Congress and Exposition in Washington, D. C.

Personnel
• Provides funds for various personnel in the Woodruff School, including the Director of Communications (Ms. Rona Ginsberg), and five Academic Professionals: Coordinator of the Frank K. Webb Program in Professional Communication (Dr. Jeffrey Donnell), the instructor for ME 1770, Engineering Graphics and Visualization (Mr. Michael Stewart), the Director of the Office of Student Services (Dr. Wayne Whitemen), the Associate Chair for Undergraduate Studies (Dr. David Sanborn, who has oversight for the senior design course), and the Undergraduate Academic Advisor (Ms. Kristi Lewis).
• Provides expenses for the Director of Development (Ms. Caroline Wood).

Training
• Funds for both off-site and on-site staff training programs.

OTHER ENDOWMENTS


Acknowledgment: This report is written and edited by Rona Ginsberg, Director of Communications for the Woodruff School. Craig Moonshower designed the document. The photographs were taken by Gary Meek, Caroline Joe, Nicole Cappello, and Rona Ginsberg. Additional photos are from the Georgia Tech or the Woodruff School Archives. Noah McNeely designed the cookout tee-shirt. Thanks to Trudy Allen, Ken Cunefare, Jeff Donnell, Melody Foster, Yogendra Joshi, Mary Jo Kleine, Kristi Lewis, Megan McRainey, David Sanborn, David Stone, Sterling Skinner, Wayne Whiteman, Ward Winer, and Caroline Wood for providing information for this report. We gratefully acknowledge the financial support of the Woodruff Endowment to the George W. Woodruff School of Mechanical Engineering.

Copyright 2004, George W. Woodruff School of Mechanical Engineering, GWW/RG092004
A school of technology was established in Atlanta in 1885. In October 1888 the Georgia School of Technology opened its doors and admitted its first engineering class: 129 mechanical engineering students enrolled in Tech’s first degree program. As part of their education these early students worked at trades such as forging, woodworking, machining, and mechanical drawing. The products of these shop exercises were then sold to the public to produce income for the School.

The first Head (starting in 1888) and Professor of Mechanical Engineering was John Saylor Coon, a graduate of Cornell University and a charter member of the American Society of Mechanical Engineers. He held this position for 35 years until his retirement in 1923. For eight years mechanical engineering was the only degree offered at Tech, and Dr. Coon saw to it that classes were challenging---so challenging that only 28 of the original students earned degrees. Uncle Si, as Professor Coon was known, set high standards, which became a precedent at Tech.

Over the years, the mechanical engineering program expanded and changed. By 1896, the contract system of shops had been abandoned. Free from the need to render a profit on instructional time, Dr. Coon implemented an educational format which, while it retained elements of hands-on shop training, placed more stress on the emerging tenets of quantification and analysis. Dr. Coon revised the curriculum, describing a mechanical engineering program that emphasized design, mathematics, and problem solving. Prominent here was a senior thesis, which was an experimental laboratory project emphasizing design and testing. Increasing emphasis was given to higher mathematics, theoretical science, and original research. The experimental project requirement survives today as the capstone experimental engineering course.

The notion that an engineer was a technical master first and a businessman second permeated the curriculum of Georgia Tech at the turn of the century. Mechanical engineering students conducted efficiency tests for businesses in Atlanta and experiments using campus facilities. Practical projects at local businesses became a significant part of the educational process at Georgia Tech, especially after the Cooperative Program officially began in 1912. This continues to be the largest optional program of its kind in the country. About forty percent of all mechanical engineering undergraduate students at Georgia Tech are involved in the program. In addition, there is a Graduate Co-op Program, an International Co-op Program, an Undergraduate Professional Internship Program, and a number of study-abroad programs for students to gain international experience.

Tech graduated its first two students, with bachelor’s degrees in mechanical engineering, in 1890. The first MSME was authorized in 1922, and a doctoral program was added in 1946. The first MS degrees were awarded in 1925, and the first Ph.D.’s were granted in 1950. Georgia Tech was renamed the Georgia Institute of Technology in 1948. Women were admitted in 1952, and the campus was voluntarily integrated in 1962. In 1949, the Department of Mechanical Engineering officially became the School of Mechanical Engineering with its own director and administrative staff. In 1985 the School was named for its benefactor, distinguished Atlanta business and civic leader, the late George W. Woodruff (class of 1917).

Today, the Woodruff School of Mechanical Engineering is the oldest and second largest of the ten divisions in the College of Engineering at Georgia Tech. Our enrollment includes 1675 undergraduate students and almost 700 graduate students. Currently, we have programs in mechanical engineering, nuclear and radiological engineering, medical physics, paper science and engineering, and bioengineering. We offer nine degrees: two in undergraduate studies (BSME and BSNRE) and seven in graduate studies (MS, MSME, MSNE, MSMP,
Currently, sample courses of instruction in mechanical engineering include: engineering graphics, mechanics, computing techniques, creative decisions and design, systems dynamics and control, dynamics of rigid bodies, circuits and electronics, engineering materials, thermodynamics, fluid mechanics, mechanics of materials, experimental methods, heat transfer, machine design, systems lab, energy systems, manufacturing processes, experimental engineering, and capstone design.

Research and teaching in the Woodruff School is directed by a distinguished group of 80 academic faculty, 22 full-time research engineers and scientists, and five academic professionals. Also, many of our graduate students are employed as research assistants and are an integral part of this technical community. Faculty work in all the traditional and cutting-edge areas of mechanical engineering: acoustics and dynamics; automation and mechatronics; bioengineering; computer-aided engineering and design; fluid mechanics; heat transfer, combustion, and energy systems; manufacturing; mechanics of materials; MEMS; and tribology. Faculty participating in the Nuclear and Radiological Engineering/Medical Physics Program do research in fission, fusion, and medical physics. In 2004-2005, Woodruff School research teams conducted work on more than 236 grants and contracts from government and industry.

In 2000, the American Society of Mechanical Engineers recognized the Woodruff School as a Mechanical Engineering Heritage Site. Of the 225 landmarks, sites, and collections, we are the only educational institution with this honor, which was granted for the impact that mechanical engineering education at Georgia Tech had on the South and the nation.

Graduates from Georgia Tech have always had a hand in helping build industry in the South. This is as true today as it was 117 years ago when Georgia Tech began to educate engineers and revitalize the economy of the South, devastated after the Civil War. Today's rigorous engineering curriculum allows our students to continue to have a lasting impact on the global society.

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The annual meeting of the Woodruff School’s advisory board was held at Georgia Tech on Friday, November 5, 2004. School Chair Dr. Ward O. Winer presented the State of the Woodruff School in the past academic year. There was a discussion on the undergraduate and graduate curricula; a review of capstone design; examples of recent research initiatives by the faculty, including the: Sustainable Energy Systems Lab; the Internet Serve Farm Energy Management Lab; plastic hypodermic needle development; micro-radiation therapy apparatus; and the SUNRISE project. The advisory board recommends strategic directions to the Woodruff School, suggests broad-based curriculum revisions, and consults with the Chair and faculty on important issues. Dr. Deborah Kilpatrick served as chair of the board meeting.

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