Click on the cover to view the report.
To Colleagues and Friends of the Woodruff School of Mechanical Engineering:

The Woodruff School had another terrific year. We hired six new faculty in academic year 1999 and made offers to four others, who will join us in academic year 2000. The new faculty expertise is in Mechanical Systems, Bioengineering, and Micro-electromechanical Systems (MEMS), which is a new thrust area for our school. This commitment includes the addition of a clean room facility for MEMS fabrication in the MRDC-II building, which is currently under construction. These new faculty also help us address some of the anticipated retirements in our thermal systems faculty.

Student demand for mechanical engineering is strong at both the undergraduate and graduate levels, to a large extent because of the very strong job market for our graduates. The Woodruff School also has a reputation among Georgia Tech students for having good academic programs, very good instruction, and strong research programs. We are committed to providing good engineering education, and the students know it. Not only have the number of students increased, but the quality of all our students is outstanding. Today, the Woodruff School is among the top producers of bachelor's, master's, and doctoral degrees in the country.

Our academic programs are undergoing major improvements. As a result of the conversion to a semester calendar, we extensively revised our undergraduate curriculum and added a number of important features. At the graduate level, we started to put master's-level courses on the Internet for distance learning. Funding from the Board of Regents', the Georgia Tech administration, and the Sloan Foundation will allow us to introduce 22 courses online. Although face-to-face interaction in the classroom is by far the best way to get an education, Internet and video deliveries are designed to help those students who are "geographically disadvantaged" but would like to have a Georgia Tech Mechanical Engineering education. We intend to serve this large and growing audience.

This year, our funded research activities topped $20 million for the first time, representing a 7.5 percent increase over the previous year. A major addition was the acquisition of a National Science Foundation Engineering Research Center in tissue engineering under the direction of Professor Bob Nerem. This highly visible activity involves many students and faculty, both in mechanical engineering and other disciplines at Georgia Tech.

Our already excellent facilities continue to improve. The Parker H. Petit Institute for Bioengineering and Bioscience Building opened this summer and our bioengineering faculty moved into the building. MRDC-II is under construction and should be finished in February or March of 2000. When the move occurs into MRDC-II, all mechanical engineering activities will be in buildings less than eight years old. I believe these will be the finest mechanical engineering educational facilities in the world.

I hope that you find this annual report informative and interesting. It represents a picture of our accomplishments for the past year in the Woodruff School, highlighting our activities for faculty, staff, our degree-granting programs, and our outstanding students. This annual report is available to anyone interested in learning more about Woodruff School activities. You will find the report on our web page at http://www.me.gatech.edu (view Woodruff School Publications or About the Woodruff School). If you have any questions about our programs or if you have any suggestions for us to continue to improve our programs, please do not hesitate to let me know.

Ward O. Winer
Eugene C. Gwaltney, Jr. Chair in Manufacturing and
Chair of the Woodruff School
This report is published once a year, in the fall, by the George W. Woodruff School of Mechanical Engineering at Georgia Tech. For more information about programs in the School, please contact us by any of the following methods:

**Letter:**  Ward O. Winer  
Chair of the George W. Woodruff  
School of Mechanical Engineering  
Georgia Institute of Technology  
Atlanta, GA 30332-0405

**Phone:** (404) 894-3200  
**Fax:** (404) 894-1658  
**E-mail:** menehp.info@me.gatech.edu  
**Web:** [http://www.me.gatech.edu](http://www.me.gatech.edu)

**Cover figures:** The pictures on the front cover surrounding the Tech Tower are some of the oldest photographs of Atlanta and mechanical engineering at Georgia Tech. Most of these pictures are from the early 1900s and reflect the all-male student body. The back cover shows the two original towers that were built when the campus opened in 1888: The tower on the left was the Shop Building, which burned down in 1892 and was not replaced; the tower on the right, today's Tech Tower, was known then as the Academic Building. Surrounding this picture are current photographs from the Woodruff School that show the noticeable changes that have occurred during this century.
In 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 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, 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. This experimental project requirement survives today as a capstone experimental engineering project course. Departments in electrical, civil, and textile engineering were added, and increasing emphasis was given to higher mathematics, theoretical science, and original research.

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 conducted experiments in 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. More than half of all ME students at Georgia Tech are involved in the program.

Tech graduated its first two students, with bachelor's degrees in mechanical engineering, in 1890. The M.S.M.E. was authorized in 1922, and a doctoral program was added in 1946. The first M.S. degrees were awarded in 1925, and the first Ph.D.'s were granted in 1950. In 1949, the Department of Mechanical Engineering officially became the School of Mechanical Engineering with its own director and administrative staff.

Today, the Woodruff School of Mechanical Engineering is the oldest and second largest of the nine divisions in the College of Engineering at Georgia Tech. In 1985 the School was named for its benefactor, distinguished Atlanta business and civic leader, the late George W. Woodruff (class of 1917). The programs in mechanical engineering, nuclear and radiological engineering, health physics, and bioengineering house more than 1300 undergraduate students and approximately 500 graduate students.

Research and teaching in the Woodruff School is directed by a distinguished group of 66 academic faculty and 15 full-time research engineers/scientists. Also, many of our graduate students are employed as research assistants and are an integral part of this technical community. In 1998-99, Woodruff School research teams conducted work on more than 245 grants and contracts from government and industry.

Graduates from Georgia Tech have always had a hand in helping build industry in the South. This is as true today as it was 111 years ago when Georgia Tech began to educate engineers and revitalize the economy of the South, devastated after the Civil War.
This past academic year was an extremely busy one for the Woodruff School, filled with some special events, such as the 50th anniversary celebration for Professor Mario Goglia, our two nationally recognized lecture series, several undergraduate and graduate events, and a faculty retreat to develop a new strategic plan for the School. All of these events, and more, are highlighted in the next few pages of this report.

Special Events

Goglia 50th Anniversary Celebration
On September 24, 1998 the Woodruff School honored Regents' Professor Emeritus Mario J. Goglia on the 50th anniversary of the signing of his contract to come to Georgia Tech. The day began with the dedication of a display case in his honor on the 4th floor of the MRDC building and continued with a luncheon at the Alumni Faculty House. Many former heads of the department of mechanical engineering, former members of the chancellor's office, and current faculty and staff attended, along with Mario's family. A short videotape of his life was shown and a number of people spoke about the influence that Mario had on their lives. We presented Mario with a scrapbook that contained pictures and tributes that we had received from some of his former students.

Professor Goglia received a B.S. degree in 1937 and an M.S. degree in 1941, both in mechanical engineering, from the Stevens Institute of Technology. In 1948, he graduated from Purdue University with a Ph.D. and came directly to Georgia Tech to join the faculty. He was born and raised in Hoboken, New Jersey.

Over the years, he has taught thermodynamics, fluid flow, automatic controls, heat transfer, and other mechanical engineering undergraduate and graduate courses. He has always been regarded by students as an outstanding educator. Although he retired from full-time teaching and research in 1981, until recently, he still taught courses in the Woodruff School, usually thermodynamics.

In 1953, Professor Goglia was named one of Atlanta’s Hundred Leaders of Tomorrow by Time Magazine, and in 1955 he was named one of the Institute's first three Regents’ Professors.
Heimlich Maneuvers at Tech
Dr. Henry J. Heimlich, creator of the lifesaving Heimlich Maneuver, gave a special seminar to the Woodruff School on February 11, 1999. Dr. Heimlich spoke about the process of creativity in biomedical engineering. He described the methods he has used to develop simple solutions to serious, fatal medical conditions and how this concept can be applied to biomedical engineering lifesaving research. Dr. Heimlich discussed the Heimlich Maneuver, which has saved the lives of thousands of choking and drowning victims, and is now being used to prevent and halt asthma attacks without using medication or to clear mucus from the lungs of cystic fibrosis patients. Dr. Heimlich also discussed some of his other procedures, and he spent a lot of time answering questions from the audience.

Dr. Heimlich was educated at Cornell University and Cornell Medical College, and he was a surgical resident at Mt. Sinai and Bellevue Hospitals in New York City. During World War II, he was a surgeon in the United States Naval Group in China. He has received numerous awards, honorary degrees, and commendations, including the Albert Lasker Public Service Award, the American Academy of Achievement Golden Plate Award, and enshrinement in the Engineering and Sciences Hall of Fame.

To learn more about Dr. Heimlich, view the program of his lecture in Publications.

ME Spring Banquet
This year’s banquet was held in the Gordy Room of the Wardlaw Center in May 1999. Approximately 125 people attended the festivities to honor graduating seniors and fellowship winners.
The program included a welcome by the Woodruff School Student Advisory Committee co-chairs, dinner, Musical MEchanics, and the 1999 Academia Awards. In addition to the distinguished alumnus award which was given to Oliver Sale (BME 1956), Dr. Winer presented the first outstanding educator award, which was given to Professor Bill Black.

Dr. Ray Vito, Associate Chair for Undergraduate Studies, recognized the undergraduate students and Dr. Bill Wepfer, Associate Chair for Graduate Studies, recognized those graduate students who had received fellowships.

**Oliver H. Sale, Jr. Named Distinguished Alumnus**

At this year's ME Spring Banquet, Oliver H. Sale, Jr. (BME '56) was named the 1999 Woodruff School Distinguished Alumnus. One of the responsibilities of this award is to speak at the banquet. He reminded the students never to give up on their dreams — he said he was not the best student when he was at Tech, but he still achieved great success because he believed that he could do it.

Mr. Sale was born in Washington, Georgia, which lies between Athens and Augusta. The family moved to Atlanta when Oliver was one year old. After graduating from North Fulton High School in 1952 he entered Georgia Tech. Mr. Sale said "he was raised to go to Tech" as his father did, and he studied mechanical engineering because he "was always interested in mechanical things so it seemed appropriate." During his four years at Tech, he was a member of Sigma Chi fraternity and was manager of the football team. He graduated in 1956 with a BME degree and was commissioned in the U.S. Air Force.

In 1960, upon leaving the Air Force, he began working with Industrial Fabricators. He purchased half of the company by 1969, and it merged with FESCO Inc. in 1970. The company built bulk materials handling systems for the crushed stone and paper industries. In 1985 the company merged with RETEC, Inc. and in 1988 he sold FESCO-RETEC to Consileum Bulk of Sweden. In 1989, Oliver Sale founded and became the president of FESCO International.

Mr. Sale has long been an ardent supporter of Georgia Tech. From 1989 to 1990 he was president of the Georgia Tech Alumni Association and he has been a member of the Georgia Tech Foundation from 1994 to the present. He was elected to the Georgia Tech Academy of Distinguished Engineering Alumni in 1994. He was appointed to the Woodruff School Advisory Board in 1988 and he currently serves as chairman.

**The Outstanding Educator Award**

The first Woodruff School Outstanding Educator Award was given to William Z. Black, Regents' Professor and Georgia Power Distinguished Professor, at the ME
Since he came to Georgia Tech in fall 1967 as an assistant professor, Professor Black has been an outstanding educator. For as long as course evaluations have been done at Georgia Tech, he has consistently received evaluations in the 4.7 (out of 5) and higher range from students in both undergraduate and graduate courses. He has been the thesis advisor to fourteen Ph.D. students and forty master's degree students. Professor Black is the only faculty member at Georgia Tech who has received the Institute Outstanding Teacher Award twice during his career, in 1973 and again in 1989.

In addition to being an outstanding educator in the traditional sense, Professor Black has maintained an excellent research program resulting in numerous publications. He has served on a number of professional society advisory committees and has played a major role in the development of ampacity standards internationally. His contributions in the area of thermal effects in electrical and electronic systems are well recognized.

Professor Black is scheduled to retire in the summer of the year 2000. He has had a long and distinguished career at Georgia Tech as an educator, professor, and researcher. The selection of Professor Black as the inaugural recipient of this award helps to continue the tradition of outstanding education in the Woodruff School.

About the Award
The George W. Woodruff Outstanding Educator Award was created in 1999 to honor members of the School's academic faculty who epitomize outstanding educators. The winner is announced at the annual ME Spring Banquet. In addition to a plaque, the educator receives $5,000 in discretionary funds to use for professional development items such as travel, computers, and support of students. The winner will be invited to deliver the Woodruff School Outstanding Educator Lecture at an assembly of all Woodruff School members. Nominations were received from members of the Woodruff School, and the winner was selected by a committee that consisted of three Woodruff School faculty members, one member of the Woodruff School Advisory Board who is also an alumnus of the School, one CETL representative, one undergraduate student, and one graduate student.

Lectures

Annual Gegenheimer Lecture on Innovation
On October 29, 1998, John H. Hatsopoulos delivered the 4th Harold W. Gegenheimer Lecture on Innovation on *Thermo Electron and the Spin-Out Business Design*. In 1983, Thermo Electron developed a novel corporate structure that the Wall Street Journal called the "spin-out" strategy to differentiate it from the "spin-off" strategy increasingly practiced by large corporations in the United States. Since this structure was put in place at Thermo Electron, the return to stockholders has averaged 28 percent each year. Today, Thermo Electron makes everything from power plants to artificial hearts and analytical instruments. At present, the group includes 23 spin-outs — and spin-outs of spin-outs — with aggregate sales of over $4 billion, employing 24 thousand individuals in 23 countries.

The Lecture Series on Innovation was established in 1995 through an endowment from Mr. Harold W. Gegenheimer.
(Class of 1933) to support student programs that encourage creativity, innovation, and design. Through the lecture series and support of capstone design projects, students are exposed to processes that stimulate creativity and lead to inventions and patents. Harold W. Gegenheimer has been associated with the printing industry all his life. As an inventor, he continues to express interest in the great advances made at his alma mater through innovative programs that link industry with graduate and undergraduate studies.

NOTICE

The 1999 Gegenheimer Lecture on Innovation will be delivered by Richard Teerlink, Retired President and CEO of Harley-Davidson, Inc. on Thursday, October 21, 1999 in the Van Leer auditorium on the Georgia Tech campus. The lecture will begin at 11:00 a.m. and his theme will be "Our Learning Journey."

The Woodruff Distinguished Lecture

On Tuesday, April 20, 1999, George H. Heilmeier, Chairman Emeritus of Telcordia Technologies (formerly Bellcore) delivered the 10th Woodruff Distinguished Lecture before a capacity crowd in the Van Leer auditorium. The Annual Distinguished Lecture was established in 1990 to honor an engineer who has made an outstanding contribution to society and to provide a forum for that person to address the Georgia Tech community. The lecture is made possible by an endowment established for the Woodruff School of Mechanical Engineering by the late George W. Woodruff. Thus, the occasion is also an opportunity to remember and honor Mr. Woodruff’s own contributions as a distinguished alumnus and as a benevolent and generous citizen of Atlanta and the State of Georgia.

Dr. Heilmeier’s day began with a luncheon and discussion for about fifty Woodruff School students, faculty, and staff. He fielded many questions on telecommunications and education. After a tour of our facilities in the accompaniment of Dr. Winer, there was a prelecture reception for members of the GT administration and other invited guests. After this brief gathering we adjourned to the auditorium to listen to Dr. Heilmeier’s slide-filled lecture titled: From POTS to PANS.com: Transitions in the World of Telecommunications for the Late 20th Century and Beyond.

He spoke about the forces that are driving us from the world of POTS (Plain Old Telephone Service) into the new world of PANS (Pretty Awesome New Services) and its implications. He discussed the technical, competitive, and customer driven changes in the structure, networks, and services of the telecommunications
industry; the business of the next Internet; technology driven *golden ages*; and implications for the training and practice of engineering.

Dr. Heilmeier is Chairman Emeritus of Telcordia Technologies, a leading provider of communications software and professional services. He joined Bellcore in March 1991 as President and CEO, and he transformed the company from a narrowly focused consortium to a global commercial business. Dr. Heilmeier, a native of Philadelphia, holds a B.S. in electrical engineering from the University of Pennsylvania and M.A., M.S.E., and Ph.D. degrees in solid-state electronics from Princeton University.

He joined RCA Laboratories in 1958, and became Head of Solid State Device Research in 1966. His work with electro-optic effects in liquid crystals led to the first liquid-crystal displays for calculators, watches, computers and instrumentation.

**NOTICE**

A transcript of Dr. Heilmeier’s lecture is now available. We are sure you will enjoy reading what he had to say. You can also view the transcripts of the 1996, 1997, 1998, and 1999 lectures at [Woodruff School Publications](#). Also, you still have the opportunity to view the lecture from our web page (open the video).

**Woodruff Seminar Series**

Each quarter, the endowment to the School sponsors the Woodruff Seminars, a series of lectures presented by national and international experts in the various research areas of mechanical and nuclear engineering. The thirteen Woodruff Seminars given during the past academic year (from September 1998 to June 1999) were:

- **Paul F. Becher**, Oak Ridge National Laboratory, *Microstructural (and Compositional) Tailoring to Improve the Fracture Resistance of Ceramics*;
- **Harry E. Cook**, Professor, University of Illinois, *Structuring the Design and Development of New Products*;
- **Richard S. Cowan**, Georgia Institute of Technology, *The U.S. Congress…A Designer of Technology?*;
- **Joshua Dayan**, Technion, Haifa, Israel, *Manipulation of Objects in an Artificial Multifinger Hand*;
- **Kenneth R. Diller**, University of Texas at Austin, *Bioengineering Analysis of Burn Injury and Treatment*;
- **Kornel F. Ehmann**, Northwestern University, *Error Analysis and Compensation of a Stewart-Platform Based Machine Tool*;
- **Roberto Horowitz**, University of California at Berkeley, *Design and Control of Electrostatic Microactuators and Micro-Gyroscopes*;
Shirley Jackson, USRC, Washington, D.C., *The Role of the Nuclear Regulatory Commission in the Future of Nuclear Energy*;
Pamela Norris, University of Virginia, *Aerogel: Unique Material, Fascinating Properties, Unlimited Applications*;
Charles S. Peskin, Courant Institute of Mathematical Sciences, New York University, *Fluid Mechanics of the Heart and Its Valves*;
Richard Rand, Cornell University, *The Dynamics of Resonance Capture*.

**ANNOUNCEMENT**

We are very pleased to announce that the 2000 Woodruff Distinguished Lecture will be delivered by Dr. William Wulf, President of the National Academy of Engineering, on Tuesday, April 25, 2000. He will speak about the image of engineers.

**Other Activities**

**Woodruff School Annual Cookout**

Woodruff School began the last academic year (September 25, 1998) with its annual cookout to welcome new graduate students, and new faculty and staff members of the Woodruff School to campus. The cookout was also attended by returning graduate students and Woodruff School faculty and staff members. The cookout, which was held on the lawn between the MRDC and the MARC buildings, is a terrific opportunity for new graduates to become acquainted with returning graduate students and to be introduced to faculty and staff members. Our newly designed tee-shirt was given to all attendees, a volleyball game went on for hours — with folks dropping in and out of the game — and there was lots of good food and conversation.

**Graduate Student Recruiting**

The Woodruff School aggressively recruits top students to enroll in our graduate programs. Extensive use is made of travel grants that enable top students to visit campus and meet with faculty and current graduate students. This past year, we provided grants for 84 students to visit the Woodruff School on four different weekends in February,
March, and April 1999. Of this cohort, 50 enrolled in fall semester 1999 and 4 have committed to enroll in fall semester 2000. Thirty six of the 72 NSF Fellows in mechanical engineering in the period from 1990-1999 were recruited to the Woodruff School from other schools. Such fellowship winning students generate additional funds and enable the Woodruff School to have a larger and better graduate program. Our recruiting activities have contributed to an enhanced applicant pool as reflected by the fact that 25% of the Fall 1999 applicants attended undergraduate schools ranked in the U.S. News & World Report top 10 mechanical engineering programs. Our ability to attract top students enables us to continue to attract top faculty and allows us to improve our strong position as a leader in graduate education, research, and economic development.

Annual Undergraduate Research Fair Held
The Woodruff School held its third annual Undergraduate Research Fair in February 1999. The purpose of the fair is to put undergraduate students who wish to do research or laboratory work in touch with a faculty member who might have work for them to do. Approximately 100 students attended the fair. Dr. Bill Wepfer gave an overview of research in the School, and then faculty representatives from each of the research groups in the School presented a short overview of their area. The School also posts information on available positions to the student newsgroups.

GT Motorsports
The Formula SAE competition was held in Pontiac, Michigan in May 1999. The team placed 16th overall, 3rd in the methanol fuel class, and was 10th overall in the design event. The car finished the endurance event for the first time in four years; in fact, the car turned 33 laps in endurance when it was only supposed to do 20 (the event organizers lost track of it, apparently). There were 105 teams registered, and almost all made it into the final event (a record). The competition continues to grow, with teams from the U.S., Canada, Mexico, Puerto Rico, and the United Kingdom: the University of Leeds took 1st in the design event. Professor Ken Cunefare is the faculty advisor to the group.

School Hosts Jobs Seminar
On May 17, 1999, Dr. Bill Wepfer, Associate Chair for Graduate Studies, hosted a special seminar for doctoral students who are looking for jobs in industry and academia. He began by telling the packed room about Wepfer’s First Law: "Getting a job is a contact sport."

John Hannabach, Head of Career Services, told the group that 83% of all graduate students have a job at their graduation: 2/3 go into industry and 1/3 in academic positions. (Wepfer said that in the Woodruff School, 70% of Ph.
D.'s go into industry and the rest into academia.) Hannabach talked about the importance of the résumé and the cover letter, and he told the students to make sure they learn as much as they can about a potential employer. He also told the students to remember this: "When you go for an interview bring ACE (attitude, competence, enthusiasm) with you into the interview and you will be successful."

Finally, Wepfer told the students not to get discouraged if they get flush letters. "Remember," he said "one yes and 99 no's and you are batting 1000 — you only need one yes."

GWW Team Raises Money for M.S. Society
Members of the Woodruff School, grouped together as Team I Am ME, walked twice around Centennial Olympic Park on Saturday morning, May 22, 1999 to raise money for the Multiple Sclerosis (M.S.) Society. The walk took just 45 minutes, after a quick aerobic workout.

Our participation grew from the fact that a member of the Woodruff School family has been diagnosed with M.S. We set our goal at $1200, which we exceeded. Those who couldn't walk, donated goodies to the bake sale. purchased their share of cake and cookies, or sponsored someone who was walking. This is the first time that the School participated in such a community event as a team, and we plan to do it again next year.
In summer 1999, our bioengineering faculty moved into the new Parker Petit Institute for Bioengineering and Bioscience building, which houses all bioengineering and biosciences faculty on campus. This new complex will enhance biorelated interdisciplinary research and education programs at Georgia Tech. The other new building that will serve Mechanical Engineering, MRDC-II, is under construction (see the photos above) and we expect to move in late February or early March of 2000. This building will house our acoustics, fluids, and thermal systems faculty as well as the new MEMS activity.

The four-story, el-shaped building will be about 135,000 square feet, and will allow the School to consolidate virtually all of its mechanical engineering activities into a three-building complex: MRDC I, II, and MARC. MRDC-II will house state-of-the-art research and laboratory facilities, and have classrooms, an atrium, laboratory space, a high-bay area, and faculty, staff, and graduate student office space. Roughly two-thirds of MRDC-II will be used for Mechanical Engineering and one-third will be for the School of Materials Science and Engineering. To watch the construction of this new building, view our web page at http://www.me.gatech.edu and click on Facilities.

Faculty News

New Faculty Members
In the fall of 1998 the Woodruff School added five new faculty members: (L to R in both rows of photos) Imme Ebert-Uphoff and William E. Singhose are assistant professors in the area of automation and mechatronics; Damir Juric is an assistant professor in the area of fluid mechanics; and Andrés García and Marc Levenston are both assistant professors in bioengineering. In January 1999, John Valentine joined the faculty as an associate professor in nuclear and radiological engineering and health physics. Previously, he was at the University of
Ward O. Winer Named to Gwaltney Chair

School Chair Ward O. Winer was appointed to the Eugene C. Gwaltney, Jr. Chair in Manufacturing. The Eugene C. Gwaltney Chair in Manufacturing Systems was established in 1986 by the Russell Corporation to honor its long-time chairman, Gene Gwaltney (BME 1940), by supporting a distinguished teacher and scholar in the area of manufacturing systems. This past year, the growth in the principal of the chair’s endowment allowed the establishment of a second Gwaltney Chair in Manufacturing; this is the chair held by Dr. Winer.

Dr. Ward O. Winer is the Chair of the George W. Woodruff School of Mechanical Engineering. He received a B.S. E., M.S.E., and Ph.D. from the University of Michigan and a Ph.D. from Cambridge University, England. After receiving his Ph.D., Dr. Winer returned to the University of Michigan where he served as a faculty member in Mechanical Engineering before joining Georgia Tech in 1969. He has been principal investigator on projects sponsored by the National Aeronautics and Space Administration, the National Science Foundation, the Office of Naval Research, the Department of Transportation, the Department of Energy, the Defense Advanced Research Projects Agency, and many industrial firms.

Dr. Winer has been the recipient of numerous awards, including the University of Michigan Alumni Society Merit Award from the Department of Mechanical Engineering and Applied Mechanics, the Sigma Xi Monie A. Ferst Memorial Award for Sustained Research from the Georgia Tech Chapter of Sigma Xi, the ASME Melville Medal, and the ASME Pi Tau Sigma Charles Russ Richards Award. In 1986, Dr. Winer was named Distinguished Professor at Georgia Tech and in 1995 and 1996 the American Society for Engineering Education honored him with the Benjamin Garver Lamme and Donald Marlowe Awards, respectively. He was elected to the National Academy of Engineering in 1988.

McDowell Named to Carter Paden Chair

Regents’ Professor David L. McDowell was named to the Carter N. Paden, Jr. Distinguished Chair in Metals Processing. Dr. McDowell joined the Woodruff School in 1983 as an assistant professor. He is presently an Institute Fellow, Regents’ Professor, and Director of the Mechanical Properties Research Laboratory. He serves as Chair of the Georgia Tech Materials Council and has a joint appointment with the School of Materials Science and Engineering.

Dr. McDowell 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 at Urbana-Champaign. He is a Fellow of the ASME and the recipient of the 1997 Nadai Award, the most prestigious honor bestowed by the Materials
Division of the ASME. His research concerns materials processing, deformation, and damage, with an emphasis on wrought and cast metals and their alloys.

About This Chair
Carter N. Paden, Jr., for whom this chair is named, graduated from Georgia Tech in 1951 with a bachelor's degree in industrial management. He is the Retired Chairman and Founder of SW Centrifugal, Inc. SW is a producer of large centrifugally cast copper-base alloy and high alloy steel castings. SW extensively machines these castings into component parts for a variety of heavy industrial machinery.

Carter and his wife, Janet, have been very generous over the years to Georgia Tech. In 1994, they established the Paden/Cheves Scholarship Fund which supports Mechanical Engineering students, and later they funded the Carter N. Paden, Jr. Distinguished Chair in Metals Processing.

Melvin Carter Elected to National Academy of Engineering
Melvin W. Carter, Neely Professor Emeritus of Nuclear Engineering and Health Physics, was elected to the National Academy of Engineering, one of the highest honors that may be accorded to an engineer. Last year, he was elected to Georgia Tech’s Engineering Hall of Fame.

His professional experience covers the past 49 years. He came to Georgia Tech in 1972 and was the first director of the Bioengineering program (1972-80). He has lectured in a number of countries, and developed and conducted several symposia, conferences, and a large number of technical short courses. His current interests include: pollutant pathways in the environment; policy formation in environmental protection and radiological protection; procedures and methods for environmental surveillance; management of radioactive wastes; radiological engineering evaluations for criteria and standards; and transportation of radioactive materials. Dr. Carter is the author of more than 100 publications.

Dr. Carter received his B.S. in civil engineering in 1949 and his M.S. in public health engineering in 1951, both from Georgia Tech. He received his Ph.D. in 1960 in radiological and environmental engineering from the University of Florida.

In addition to Dr. Carter, the Woodruff School faculty includes two members of the National Academy of Engineering (NAE): Robert Nerem and Ward O. Winer; and two NAE members who hold joint or adjunct appointments in the Woodruff School: Ben Zinn and Ernest Wilkins.
Annual Faculty Retreat
This year’s faculty retreat was held on May 18, 1999 at the Aberdeen Woods Conference Center in Peachtree City, Georgia, where the focus was strategic planning for the Woodruff School. The faculty members broke into working groups to discuss objectives and specific initiatives. In the afternoon, the ideas of each group were discussed, and a reception was held.

The statements that served as the focal point of discussion were: Provide an educational experience that enables development of the best engineering talent. Conduct research that expands the frontiers of knowledge in engineering and technology, and acts as a catalyst for long-term economic development and helps create an enriched, more prosperous and sustainable society. Create an environment and educational experience that reflect diversity in the State of Georgia and the nation and the global/international nature of engineering practice and business activities. Be a leader in nontraditional delivery of education. Be a model for fostering entrepreneurship, corporate interaction, and economic development. Attract, develop, and retain the best and brightest faculty.

With input on these items from the faculty, a Woodruff School strategic plan was prepared by the Faculty Advisory Committee. This was distributed to all faculty and staff in the School for comment. Upon approval by the faculty, the document will be published in the next issue of mega tech.
The Woodruff School maintains a standard of excellence in all the core, traditional areas of mechanical engineering, while still retaining the ability to expand into other interdisciplinary areas and applications such as acoustics, bioengineering, materials, micro-electromechanical (MEMS), and nanotechnology. The academic faculty represents this breadth of coverage, giving our students the opportunity to learn from professors who work on the cutting edge of technical and scientific research and to give graduate students an edge to focus their studies in all our research areas.

School Demographics

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty (Tenure Track)</td>
<td>66</td>
</tr>
<tr>
<td>Joint Appointments</td>
<td>6</td>
</tr>
<tr>
<td>Endowed/Distinguished Faculty</td>
<td>11</td>
</tr>
<tr>
<td>Research Faculty</td>
<td>15</td>
</tr>
<tr>
<td>Academic Professionals</td>
<td>2</td>
</tr>
<tr>
<td>Adjunct and Part-Time Faculty</td>
<td>7</td>
</tr>
<tr>
<td>Emeritus Faculty</td>
<td>13</td>
</tr>
<tr>
<td>Postdoctoral Fellows</td>
<td>10</td>
</tr>
<tr>
<td>Visiting Scholars</td>
<td>15</td>
</tr>
<tr>
<td>Support Staff</td>
<td>46</td>
</tr>
</tbody>
</table>

Woodruff School Academic Faculty

**Said I. Abdel-Khalik**, *Southern Nuclear Distinguished Professor and Professor of Nuclear Engineering*
Ph.D., University of Wisconsin, 1973
Reactor safety, thermal hydraulics, and accident analysis

**Daniel F. Baldwin**, *Assistant Professor*
Ph.D., Massachusetts Institute of Technology, 1994
Manufacturing systems, electronic manufacturing and packaging, and polymer processing

**Yves H. Berthelot**, *Professor*
Ph.D., University of Texas at Austin, 1985
Structural acoustics, ultrasonic nondestructive evaluation, and ground effects in outdoor sound propagation
William Z. Black, Georgia Power Distinguished Professor and Regents' Professor
Ph.D., Purdue University, 1968
Heat transfer, thermodynamics, and fluids

Wayne J. Book, Professor
Ph.D., Massachusetts Institute of Technology, 1974
Robotics, automation, modeling, and control of flexible, fluid power, and manufacturing systems

Bert A. Bras, Associate Professor
Ph.D., University of Houston, 1992
Environmentally conscious design, design for recycling, and robust design

Robert S. Cargill, Assistant Professor
Ph.D., University of Pennsylvania, 1994
Cell biomechanics, trauma and development, and tissue engineering

Ye-Hwa Chen, Associate Professor
Ph.D., University of California, Berkeley, 1985
Controls, manufacturing systems, neural networks, and fuzzy engineering

Jonathan S. Colton, Professor
Ph.D., Massachusetts Institute of Technology, 1986
Manufacturing, polymer and composites processing, design, and rapid prototyping

Kenneth A. Cunefare, Associate Professor
Ph.D., Pennsylvania State University, 1990
Active/passive control, fluid-structure interaction, and optimal acoustic design

Steven Danyluk, Morris M. Bryan, Jr. Chair in Mechanical Engineering for Advanced Manufacturing Systems and Professor of Mechanical Engineering
Ph.D., Cornell University, 1974
Processing of materials, residual stresses, tribology, lubricant-surface interaction, chemomechanical polishing, and sensors

Prateen V. Desai, Professor
Ph.D., Tulane University, 1967
Fluid mechanics, solidification, and convection in materials processing

Imme Ebert-Uphoff, Assistant Professor
Ph.D., The Johns Hopkins University, 1997
Robotics, parallel platform manipulators, flight simulation, and static balancing

Aldo A. Ferri, Associate Professor
Ph.D., Princeton University, 1985
Acoustics, structural dynamics, and nonlinear dynamics and control

Robert E. Fulton, Professor
Ph.D., University of Illinois at Urbana-Champaign, 1960
Finite-element methods, integrated CAD/CAM, information management, and electronic commerce

Andres J. Garcia, Assistant Professor
Ph.D., University of Pennsylvania, 1996
Cellular and tissue engineering, cell adhesion, and biomaterials

S. Mostafa Ghiaasiaan, Associate Professor
Ph.D., University of California, Los Angeles, 1983
Heat transfer, multiphase flow, change-of-phase heat and mass transfer, aerosol and particle transport, thermal hydraulics of nuclear systems

**Jerry H. Ginsberg**, George W. Woodruff Chair in Mechanical Systems and Professor of Mechanical Engineering
E.Sc.D., Columbia University, 1970
Vibrations, acoustics, dynamics, and fluid-structure interaction

**Ari Glezer**, Professor
Ph.D., California Institute of Technology, 1981
Fluid mechanics, turbulent shear flows, flow control, and diagnostics

**Itzhak Green**, Professor
Sc.D., Technion-Israel Institute of Technology, Haifa, Israel, 1984
Finite element methods, rotordynamics, fluid sealing, design, and integrated design

**Robert E. Guldberg**, Assistant Professor
Ph.D., The University of Michigan, 1995
Biomechanics, image-based FEM, and tissue engineering

**James G. Hartley**, Professor
Ph.D., Georgia Institute of Technology, 1977
Heat transfer, thermodynamics, and fluid mechanics

**Nolan E. Hertel**, Professor
Ph.D., University of Illinois at Urbana-Champaign, 1979
Radiation shielding, neutron dosimetry, radiological assessment and waste management, health risk assessment, accelerator sources and applications

**Jacek Jarzynski**, Professor
Ph.D., Imperial College of Science and Technology, London, 1961
Acoustics, acousto-optics, transducers, and ultrasonics

**Iwona M. Jasiuk**, Associate Professor
Ph.D., Northwestern University, 1986
Micromechanics, fracture, damage mechanics, composite materials, and biomaterials

**Sheldon M. Jeter**, Associate Professor
Ph.D., Georgia Institute of Technology, 1979
Heat transfer, thermal hydraulics

**Damir Juric**, Assistant Professor
Ph.D., The University of Michigan, 1996
Computational methods, multiphase flows, and microscale materials processing

**Prasanna V. Kadaba**, Associate Professor
Ph.D., Illinois Institute of Technology, 1964
Heat transfer, I.C. engine design, energy and environmental systems, and advanced cycles

**David N. Ku**, Regents' Professor
M.D., Emory University, 1984, Ph.D., Georgia Institute of Technology, 1983
Magnetic resonance, thrombosis, and prostheses

**Thomas R. Kurfess**, Associate Professor
Ph.D., Massachusetts Institute of Technology, 1989
System dynamics, control, metrology, and CAD/CAM/CAE

**Alan V. Larson**, Professor and Associate Chair for Administration
W. Jack Lackey, Professor
Ph.D., North Carolina State University, 1970
Ceramic and metallic coatings, composites, and rapid prototyping

Kok-Meng Lee, Associate Professor
Ph.D., Massachusetts Institute of Technology, 1985
System dynamics, control, automation, and optomechatronics

Marc E. Levenston, Assistant Professor
Ph.D., Stanford University, 1995
Orthopedic biomechanics, soft tissue mechanics, and tissue engineering

Steven Y. Liang, Associate Professor
Ph.D., University of California, Berkeley, 1987
Automated manufacturing, control systems, and digital signal processing

Harvey Lipkin, Associate Professor
Ph.D., University of Florida, 1985
Design and analysis of mechanical systems, robotics, and spatial mechanisms

Christopher S. Lynch, Assistant Professor
Ph.D., University of California, Santa Barbara, 1992
Experimental mechanics and smart materials

David L. McDowell, Carder N. Paden Distinguished Chair in Metals Processing and Regents' Professor
Ph.D., University of Illinois at Urbana-Champaign, 1983
Fracture, fatigue, cyclic plasticity and viscoplasticity, finite strain effects, continuum damage, and metals processing

Shreyes N. Melkote, Assistant Professor
Ph.D., Michigan Technological University, 1993
Machining process modeling, surfaces, CAM/CAPP, and intelligent fixturing

Farrokh Mistree, Professor
Ph.D., University of California, Berkeley, 1974
Design of open systems, decision-based design, product families, and enterprise integration

G. Paul Neitzel, Professor
Ph.D., The John Hopkins University, 1979
Hydrodynamic stability, numerical methods, and free-surface and rotating flows

Robert M. Nerem, Institute Professor and Parker H. Petit Distinguished Chair for Engineering in Medicine
Ph.D., The Ohio State University, 1964
Biomedical engineering, biomechanics, cellular engineering, and tissue engineering

Richard W. Neu, Assistant Professor
Ph.D., University of Illinois at Urbana-Champaign, 1991
Fatigue, viscoplasticity, and composite materials

John G. Papastavridis, Associate Professor
Ph.D., Purdue University, 1976
Analytical, structural and nonlinear mechanics, vibrations, and stability

Jianmin Qu, Associate Professor
Ph.D., Northwestern University, 1987
Fracture, materials, wave propagation, and microelectronic packaging

Farzad Rahnema, Associate Professor
Ph.D., University of California, Los Angeles, 1981
Reactor physics, perturbation and variational methods, reactor simulator and monitoring methods, criticality safety, and benchmark methods

Peter H. Rogers, Rae and Frank H. Neely Distinguished Professor in Mechanical Engineering
Ph.D., Brown University, 1970
Acoustics and bioacoustics

David W. Rosen, Associate Professor
Ph.D., University of Massachusetts, 1992
Virtual and rapid prototyping and intelligent CAD/CAM/CAE

Nader Sadegh, Associate Professor
Ph.D., University of California, Berkeley, 1987
Controls, vibrations, and design

Richard F. Salant, Professor
Sc.D., Massachusetts Institute of Technology, 1967
Fluid mechanics and fluid sealing

Sam V. Shelton, Associate Professor
Ph.D., Georgia Institute of Technology, 1969
Energy systems, HVAC systems, absorption, and refrigeration

William E. Singhose, Assistant Professor
Ph.D., Massachusetts Institute of Technology, 1997
Vibration, flexible dynamics, and command generation

Suresh Sitaraman, Assistant Professor
Ph.D., The Ohio State University, 1989
CAD/CAE, electronic packaging, thermomechanics and reliability, and FEM

Marc K. Smith, Associate Professor
Ph.D., Northwestern University, 1982
Flows, liquid films, and droplets

Weston M. Stacey, Jr., Fuller E. Callaway and Regents’ Professor
Ph.D., Massachusetts Institute of Technology, 1966
Fusion engineering, plasma physics, and reactor physics

Jeffrey L. Streator, Associate Professor
Ph.D., University of California, Berkeley, 1990
Computer-disk tribology, rheology, friction-induced vibration, and capillarity

Charles Ume, Professor
Ph.D., University of South Carolina, 1985
Electronic packaging, mechatronics, and laser moiré/ultrasonics

John D. Valentine, Associate Professor
Ph.D., The University of Michigan, 1993
Radiation detection and measurements, medical imaging, environmental monitoring, nuclear waste monitoring, personnel monitoring, scintillator and semiconductor detector characterization and development
Raymond P. Vito, Professor and Associate Chair for Undergraduate Studies
Ph.D., Cornell University, 1971
Biomechanics, tissue mechanics, and biomechanical design

C.-K. Chris Wang, Associate Professor
Ph.D., The Ohio State University, 1989
Radiation detection, radiation dosimetry, medical and industrial applications of ionizing radiations, and spent nuclear fuel measurements

William J. Wepfer, Professor and Associate Chair for Graduate Studies
Ph.D., University of Wisconsin, 1979
Heat transfer and thermodynamics

Ward O. Winer, Eugene C. Gwaltney Chair in Manufacturing, Regents’ Professor, and Chair of the Woodruff School
Ph.D., Cambridge University, 1964,
Ph.D., The University of Michigan, 1961
High-pressure rheology, lubrication, tribology, thermo-mechanics, and mechanical systems diagnostics

Wenjing Ye, Assistant Professor
Ph.D., Cornell University, 1998
Micro-electromechanical systems, computational mechanics, numerical analysis, and design

Minami Yoda, Assistant Professor
Ph.D., Stanford University, 1993
Suspension flows, shear flows, flow-structure interactions, and optimal diagnostics

Min Zhou, Assistant Professor
Ph.D., Brown University, 1993
Experimental mechanics, dynamic behavior, material failure, and shear localization

Cheng Zhu, Associate Professor
Ph.D., Columbia University, 1988
Cell and molecular mechanics and applications to immunology and tumor biology

Academic Faculty with Joint Appointments

W. Steven Johnson, Professor of Materials Science and Engineering
Ph.D., Duke University, 1979
Deformations, composite materials, and joints

Gunter H. Meyer, Professor of Mathematics
Ph.D., University of Maryland, 1967
Numerical methods for partial differential equations, reaction diffusion problems and numerical heat transfer, and hydrodynamic stability

Amyn S. Teja, Regents’ Professor of Chemical Engineering
Ph.D., Imperial College, London, 1972
Thermodynamics, fluid properties, and supercritical fluid separations

Timothy M. Wick, Associate Professor of Chemical Engineering
Ph.D., Rice University, 1988
Tissue and cellular engineering and bioreactor design, cell adhesion, blood rheology
Ajit P. Yoganathan, Regents’ Professor of Biomedical Engineering
Ph.D., Rice University, 1978
Cardiovascular fluid dynamics, rheology, Doppler ultrasound, and MRI

Ben T. Zinn, David S. Lewis Chair of Aerospace Engineering and Regents’ Professor
Ph.D., Princeton University, 1965
Combustion instability, pulse combustion, propulsion, and acoustics

Academic Professionals

Robert L. Mabrey, Academic Professional
M.A., Eastern Michigan University, 1968
Hybrid computer modeling, visualization processes, rapid prototyping, and design

James Michael Wileman, Academic Professional
(Associate Director of Georgia Tech Lorraine, Metz, France)
Ph.D., Georgia Institute of Technology, 1994
Mechanical seal dynamics, tribology, rotor dynamics, and design

Adjunct Professors and Part-Time Appointments

Cyrus K. Aidun, Adjunct Professor, Institute of Paper Science and Technology
Ph.D., Clarkson University, 1985
Hydrodynamic stability, liquid coating, and suspended particle hydrodynamics

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

Stephen L. Dickerson, Professor Emeritus (part-time)
Ph.D., Massachusetts Institute of Technology, 1965
Automatic control, machine vision, and manufacturing automation

Mario J. Goglia, Regents’ Professor Emeritus (part-time)
Ph.D., Purdue University, 1948
Compressible fluid flow, incompressible fluid flow, and thermodynamics

William C. Hutton, Adjunct Professor, Emory University
Ph.D., University of Birmingham, England, 1984
Bioengineering and orthopaedic mechanics

Rodney D. Ice, Adjunct Professor, Neely Nuclear Reactor
Ph.D., Purdue University, 1967
Radiopharmaceuticals, radioprotectants, boron neutron capture theory, radionuclide methodology, and hospital health physics

J. Ernest Wilkins, Jr., Adjunct Professor, Clark-Atlanta University
Ph.D., University of Chicago
Woodruff School Emeritus Faculty

Samuel C. Barnett, Professor Emeritus, Retired June 1980
Melvin W. Carter, Neely Professor Emeritus of Nuclear Engineering and Health Physics, Ph.D., University of Florida, Retired July 1988
Joseph D. Clement, Professor Emeritus, Ph.D., University of Wisconsin, Retired December 1991
Gene T. Colwell, Professor Emeritus, Ph.D., University of Tennessee, Retired June 1995
Monte Davis, Professor Emeritus of Nuclear Engineering and Health Physics, Ph.D. Oregon State University, Retired October 1987
Stephen L. Dickerson, Professor Emeritus, Ph.D., Massachusetts Institute of Technology, Retired June 1996
Pandeli Durbetaki, Professor Emeritus, Ph.D., Michigan State University, Retired October 1995
Geoffrey C. Eichholz, Regents' Professor Emeritus, Ph.D., University of Leeds, Retired July 1988
Mario J. Goglia, Regents' Professor Emeritus, Ph.D., Purdue University, Retired December 1981
Bernd Kahn, Professor Emeritus and Director, Environmental Resources Center, Ph.D., Massachusetts Institute of Technology, Retired April 1996
Ratib Karam, Professor Emeritus, Ph.D., University of Florida, Retired June 1997
S. Peter Kezios, Regents' Professor Emeritus, Ph.D., Illinois Institute of Technology, Retired July 1990
Alfred Schneider, Professor Emeritus, Ph.D., Polytechnical University of New York, Retired June 1990

Research Faculty

Janet Allen, Senior Research Scientist
Ph.D., University of California, Berkeley, 1973
Design evolution over time, modeling uncertainty, decision-based design, and design pedagogy
Scott S. Bair, Principal Research Engineer
Ph.D., Georgia Institute of Technology, 1990
Tribology, rheology, properties of liquids at high pressure, and machine design
Van B. Biesel, Research Engineer II
M.S., Georgia Institute of Technology, 1993
Acoustics, vibrations, noise control, numerical modeling, transducers, and piezoelectric materials
John R. Bogle, Research Engineer II
M.S., Georgia Institute of Technology, 1987
Structural acoustics, finite/boundary element modeling interaction of underwater sound and structures, and vibrations
Richard S. Cowan, Research Engineer II; Program Manager MultiUniversity Center for Integrated Diagnostics
M.S., Georgia Institute of Technology, 1992
Mechanical system maintenance and modeling, technology management, and public policy
Michael L. Dowling, Research Engineer II
Steven R. Hahn, Research Engineer II
M.S., Georgia Institute of Technology, 1988
Structural acoustics, vibrations and control, and finite element and boundary element techniques

Gregg D. Larson, Research Engineer II
Ph.D., Georgia Institute of Technology, 1996
Transduction, acoustics, vibrations, and piezoelectric ceramics

Joey G. Lloyd, Research Engineer I
B.S., Georgia Institute of Technology, 1988
Mechanical design, robotics, finite element modeling, and programming

Thomas M. Logan, Research Engineer I
M.S., Georgia Institute of Technology, 1997
Underwater and structural acoustics, advanced submarine sonor systems

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

Dennis L. Sadowski, Research Engineer II
M.S., University of Illinois, 1986
Thermal sciences, design and construction of experimental equipment

Guang-Fa Yao, Research Engineer II
Ph.D., Georgia Institute of Technology, 1996
Computational fluid dynamics and heat transfer, multiphase and turbulent flows, Arbitrary-Eulerian-Lagrangian (ALE) formulation, and numerical modeling of flows with free surface or moving boundaries

Xuezhen Zhang, Research Scientist II
M.S. Nanjing University, 1963
Computational acoustics and shallow water acoustics

Ji-Xun Zhou, Principal Research Scientist
Ph.D., Graduate School of Chinese Academy of Sciences, 1967
Shallow water acoustics, sound propagation and reverberation, acoustic interactions with internal waves, seafloor acoustics, acoustic remote sensing

Chaired Faculty

The Woodruff School has eleven faculty members who hold distinguished professorships or chairs. They are: Said Abdel-Khalik, Southern Nuclear Distinguished Professor; William Z. Black, Georgia Power Distinguished Professor; Steven Danyluk, Morris M. Bryan, Jr. Chair in Mechanical Engineering for Advanced Manufacturing Systems; Jerry H. Ginsberg, George W. Woodruff Chair in Mechanical Systems; David N. Ku, Lawrence P. Huang Endowed Chair in Engineering and Entrepreneurship; David L. McDowell, Carter Paden Jr. Chair in Metals Processing; Robert M. Nerem, Parker H. Petit Distinguished Chair for Engineering in Medicine; Peter H. Rogers,
Rae and Frank Neely Professor in Mechanical Engineering; Weston M. Stacey, Jr., Callaway Professorship in Nuclear Engineering; Ward O. Winer, Eugene C. Gwaltney Jr. Chair in Manufacturing; and Ben Zinn, David S. Lewis, Jr. Chair in Aerospace Engineering.

Fellows of Professional Societies

Many faculty members hold the prestigious grade of fellow in professional societies:

Acoustical Society of America (ASA): Yves Berthelot, Jerry Ginsberg, Jacek Jarzynski, Peter Rogers
American Association for the Advancement of Science (AAAS): Robert Nerem, Ward Winer
American Ceramic Society: Jack Lackey
American Institute for Medical and Biological Engineering: David Ku, Robert Nerem, Ajit Yoganathan
American Institute of Aeronautics and Astronautics: Ben Zinn
American Nuclear Society (ANS): Said Abdel-Khalik, Weston Stacey
American Physical Society (APS): Paul Neitzel, Robert Nerem, Weston Stacey
American Society for Testing and Materials (ASTM): Steven Johnson
American Society of Heating, Refrigerating and Air Conditioning Engineers: Prasanna Kadaba, Samuel Shelton, William Wepfer
Institute for Mechanical Engineers: Robert Nerem (Honorary)
Institute of Electrical and Electronics Engineers (IEEE): William Black, Wayne Book
Society of Tribologists and Lubrication Engineers (STLE): Richard Salant, Ward Winer

National Science Foundation Award Winners

Sixteen current Woodruff School faculty members have received National Science Foundation (NSF) Career Awards (previously known as the Presidential Young Investigator Award or the Young Investigator Award. Current and former winners are: Cyrus Aidun (joint appointment in ME), Yves Berthelot, Bert Bras, Jonathan Colton, David Ku, Thomas Kurfess, Kok-Meng Lee, Harvey Lipkin, Christopher Lynch, David McDowell, Paul Neitzel, Suresh Sitaraman, Marc Smith, Jeffrey Streator, John Valentine, and Cheng Zhu.

In addition, six faculty members who have since left Georgia Tech and six Woodruff School Ph.D. alumni who have started academic careers elsewhere have received this prestigious award (see Alumni Honors).

Woodruff Faculty Fellows

The Woodruff Faculty Fellow Program recognizes outstanding mechanical engineering academics who are in the early to middle years of their professional development. This program encourages these young professors to build

...
their careers at Georgia Tech, and provides support as they mature into senior faculty members with national and international reputations. This program focuses on those individuals who have progressed beyond the level of assistant professor and who show potential for major contributions as engineering leaders of the future.

The faculty members receive $10,000 per year for a five-year, nonrenewable period funded from the endowment of the Woodruff School. These funds can be used as discretionary funds in support of the Fellow’s research. The maximum number of Fellows is limited to one-third of the number of Associate Professors in the School. The first Woodruff Faculty Fellows were appointed in the 1991-1992 academic year. There were no Woodruff Faculty Fellows named during this past academic year. Recipients and the period of appointment are: June 1997 to June 2002: Steven Liang, Jianmin Qu, and Cheng Zhu; June 1994 to June 1999: Kok-Meng Lee; June 1993 to June 1998: Aldo Ferri and Itzhak Green; June 1992 to June 1997: Yves Berthelot and Jonathan Colton; June 1991 to June 1996: David Ku and David McDowell.

Research Groups

Our new Research Brochure presents a detailed description of each of the ten self-selected research areas in the School, and a biosketch of each faculty member that includes a description of his or her research, background, education, and honors. You may view the book on our web page at http://www.me.gatech.edu/me/publicat/brochures.html or check out the new individual faculty pages through the Faculty/Staff Page. Shortened descriptions follow.

**Acoustics & Dynamics**

Research is devoted to an exploration of vibratory phenomena that are encountered in structural systems, in the air, and in the water. In fluid media, these vibrations are called sound, so the area is referred to as acoustics, but many of the questions and research tools are common to all areas.
Recent projects have explored the measurement of vibration using laser Doppler techniques; used ultrasonic signals to detect defects in structures; combined ultrasonics with laser techniques; explored the effects of loud signals in the water with the objective of assisting navy divers; explored the use of wedges to produce shock absorbers that are effective for both vibration reduction and shock isolation; and examined concepts for experimental modal analysis.

**Automation & Mechatronics**
Research varies from fundamental work in control theory to the conception, design, and prototype evaluation of innovative mechatronic systems and applications to automation. Research in mechatronics focuses on the fusion of mechanical and electrical disciplines in modern engineering processes, aimed at achieving a cost-effective, optimal balance between mechanical structure and their overall control.

Research topics include active and passive damping, adaptive, learning and robust control of systems with uncertainty, automated manufacturing and demanufacturing, fuzzy and neural networks for control and identification, precision engineering and motion control, multimedia technology, intelligent sensors and actuators, vision-based motion control and teleoperation.

**Bioengineering**
Bioengineering is the application of engineering principles to the study and control of biological processes. Studies are being conducted on detailed fluid dynamic aspects of blood flow in arteries. In tissue mechanics the focus is on cardiovascular, orthopedics, and ophthalmologic applications. Cellular engineering studies range from basic cell biology to cell-based applications. Georgia Tech is a leader in the area of tissue engineering research which involves the use of living cells and/or other natural biological materials in the development of biological substitutes.

**Computer-Aided Engineering & Design**
The goal is to develop computer-based, systems-oriented methods and the supporting infrastructure that facilitates the effective realization of engineering products and systems for the global marketplace. The research focus is on computer-aided design (CAD), computer-aided engineering (CAE), and design as a discipline.
Areas of interest include design of industrial ecosystems; electronic commerce; environmentally conscious design and manufacture of engineering systems; intelligent design systems; process mechanics simulation and miniaturization of next-generation microelectronic packages; rapid prototyping methods and technologies; simulation-based design of product families; and thermomechanical modeling and reliable design of microelectronic packages.

**Fluid Mechanics**

The group performs research in a variety of areas, employing theoretical, experimental, and numerical tools. Current projects include studies in turbulent jets and mixing layers, flow control using piezoelectric actuators, hydrodynamic stability of flows driven by surface-tension gradients, fluid mechanics in microgravity, thin films, stability of unsteady swirling flows, vortex breakdown and, in conjunction with faculty in bioengineering, work on hemodynamics, on flow in bioreactors, and on the fluid dynamics of the heart.

**Fusion**

Fusion is being developed as an environmentally benign source of energy. Fundamental research is in the physics of magnetically confined plasmas and their interactions with material surfaces, the development of the engineering sciences of fusion, the conceptual design of fusion applications for electric power production, and the evaluation of the environmental characteristics of future fusion plants.

**Heat Transfer, Combustion, and Energy Systems**

Fundamental research is conducted in the areas of ultra high heat flux cooling systems, microscale heat transfer, two-phase flow instabilities, droplet and spray cooling, evaporation and condensation, electrohydrodynamic enhancement of heat and mass transfer, combustion instabilities, reactive flows, and pulse combustion. Among the applied research projects currently underway are electronic components cooling; drying of porous media; design and performance optimization of steam conditioning equipment; heat pipe technology; thermally activated and sorption heat pumps; commercial and residential heating and cooling systems; and system studies of high performance, low emission jet engines.

**Manufacturing**

Research involves polymers and composites, materials development and
processing, semiconductor polishing, processing of components from ceramics and high-temperature superconductors, precision machining and metrology, chip formation processes and machine compensation, printed wiring assemblies and printed circuit boards, mechanical assembly, microelectronic interconnections, process automation, and sensor development and integration.

Mechanics of Materials
Research involves topics at the interface of materials science and mechanics of materials. Current research includes fracture along interfaces between materials with distinct properties, distributed damage effects in monolithic and composite materials, deformation behavior of heterogeneous materials, compressible finite strain plasticity and viscoplasticity, multiaxial fatigue and creep-fatigue interaction in high temperature materials, friction in metal forming operations, and behavior of smart materials.

Nuclear and Radiological Engineering and Health Physics
Nuclear Engineering concerns the safe release, control, and use of all types of energy from nuclear sources. Research projects include the development of improved reactor physics and computational methods, heat removal from nuclear systems, nuclear criticality safety, high-energy radiation transport computations, radioactive waste disposal, and the conceptual design of fusion reactors and plutonium disposal facilities.

Research efforts in Health Physics include the physical measurement of radiation and radioactivity, the relationship of radiation exposure to health, the prediction of the fate of radioactive materials in the environment, and the design of radiologically safe processes.

Research in Radiological Engineering includes radiation shielding, neutron spectrometry and dosimetry, instrument calibration and response, radiopharmaceuticals, and engineering problems related to radiotherapy.

Tribology
Research efforts include seal technology, tribological behavior of computer disk drives, rotordynamics, friction-induced vibration, infrared thermometry, high- and low-pressure rheology, thermo-mechanical wear theory, and the polishing of semiconductors for the manufacturing of integrated circuits. Most of the work is of a basic nature, leading to an understanding of the complex tribological reactions that occur in the microcosm of the real areas of contact and thin lubricating films between surfaces in relative motion.
The staff of the Woodruff School is highly qualified and dedicated to enhancing our programs. We have a support staff of 46 as a result of additions in both the electronics support group and the finance area.

Trudy Allen, Academic Assistant II
Carla Bennett, Accountant II
Kimberly Blue, Undergraduate Academic Advisor
Vladimir Bortkevich, Electrical Engineer II
Donald F. “Butch” Cabe, Manger of Facilities
Tilden E. “Gene” Clopton, Director of Special Projects
Robert Cooper, Mechanical Technician III
Phillip R. Coulson, Accountant II
Betty M. Crumbley, Administrative Assistant I
Andrew G. “Drew” Davis, Electronics Technician III
Martin L. Davisson, Systems Analyst III
Royal F. “Pete” Dawkins, Director of Finance
Judith E. Diamond, Administrative Assistant I
Kenneth Dollar, Director of Support and Technical Services
Jeffrey A. Donnell, Communications Program Coordinator
Debra L. Finney, Administrative Assistant I
Melody Foster, Administrative Manager I
Norma L. Frank, Academic Advisor I
Phyllis Frost, Administrative Supervisor II
Rona A. Ginsberg, Director of Publications and Public Relations
John W. Graham, Machine Shop Manager
Rebecca Hembree, Administrative Assistant I
Angela L. Hicks, Administrative Assistant II
Wanda Joefield, Administrative Assistant I
Vivian Johnson, Administrative Assistant I
Cecelia Jones, Administrative Assistant I
Mary Jo Kleine, Administrative Assistant II
Joan Kraft, Undergraduate Academic Advisor
Sherron Lazarus, Administrative Manager I
Donald E. Long, Mechanical Technician III
Joyce Lowe, Administrative Assistant II
Lisa Manning, Administrative Assistant II
John P. McCullough, II, Manager of Computing, Networking and Electronics
Nancy D. Moody, Administrative Manager I
Jefforey Murphy, Systems Analyst III
The student community in the Woodruff School reflects a rich diversity of person and place and a common bond of excellence. A profile of the freshman class entering the Woodruff School in September 1999 and a profile of the Woodruff School graduate class accepted for summer/fall 1999 are shown in the next two charts.

## Class Profiles

### Freshmen Students

<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average SAT Score (Out of 1600)</td>
<td></td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>1315</td>
</tr>
<tr>
<td>Nuclear Engineering</td>
<td>1319</td>
</tr>
<tr>
<td>Georgia Tech</td>
<td>1304</td>
</tr>
<tr>
<td>High School Grade Point Average</td>
<td></td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>3.79</td>
</tr>
<tr>
<td>Nuclear Engineering</td>
<td>3.61</td>
</tr>
<tr>
<td>Georgia Tech</td>
<td>3.79</td>
</tr>
<tr>
<td>Total Number of Freshmen</td>
<td>163</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>157</td>
</tr>
<tr>
<td>Nuclear Engineering</td>
<td>6</td>
</tr>
<tr>
<td>Males</td>
<td>136</td>
</tr>
<tr>
<td>Females</td>
<td>27</td>
</tr>
<tr>
<td>Georgia Residents</td>
<td>78</td>
</tr>
<tr>
<td>Out-of-State Residents</td>
<td>85</td>
</tr>
</tbody>
</table>

### Incoming Graduate Students

<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
<td>161</td>
</tr>
<tr>
<td>Applicants</td>
<td>527</td>
</tr>
<tr>
<td>Admitted (47% of applicants)</td>
<td>247</td>
</tr>
<tr>
<td>Matriculated (58% of those applying)</td>
<td>161</td>
</tr>
<tr>
<td>Average Grade Point Average (GPA)</td>
<td>3.51</td>
</tr>
<tr>
<td>Average Score on Graduate Record Exam (GRE)</td>
<td>1900 (out of 2400)</td>
</tr>
</tbody>
</table>

Geographical Breakdown by Sector and Percent
<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
<th>Percent</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Females</td>
<td>185</td>
<td>17</td>
<td>87</td>
<td>18</td>
</tr>
<tr>
<td>Males</td>
<td>914</td>
<td>83</td>
<td>408</td>
<td>82</td>
</tr>
<tr>
<td>Minorities</td>
<td>257</td>
<td>23</td>
<td>85</td>
<td>17</td>
</tr>
<tr>
<td>International</td>
<td>NA</td>
<td>—</td>
<td>94</td>
<td>19</td>
</tr>
<tr>
<td><strong>Total enrollment</strong></td>
<td>1099</td>
<td>495</td>
<td>495</td>
<td></td>
</tr>
</tbody>
</table>

Note: Minority (ethnic origin) includes only U.S. citizens and permanent residents: Asians, Blacks, Hispanics, American Indian, and Multiracial. Co-ops at work are also excluded. The percentage of minority students is based on the total number of U.S. citizens and permanent residents.
Undergraduate and Graduate Student Enrollment in the College of Engineering  
(Fall 1997 and 1998)

<table>
<thead>
<tr>
<th>School</th>
<th>Undergraduates</th>
<th>Graduates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace Engineering</td>
<td>266</td>
<td>339</td>
</tr>
<tr>
<td>Bioengineering</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>691</td>
<td>690</td>
</tr>
<tr>
<td>Civil and Environmental Engineering</td>
<td>606</td>
<td>553</td>
</tr>
<tr>
<td>Electrical and Computer Engineering</td>
<td>1,557</td>
<td>1,765</td>
</tr>
<tr>
<td>Industrial &amp; Systems Engineering</td>
<td>990</td>
<td>1,098</td>
</tr>
<tr>
<td>Materials Science and Engineering</td>
<td>70</td>
<td>60</td>
</tr>
<tr>
<td><strong>Mechanical Engineering</strong></td>
<td><strong>1,059</strong></td>
<td><strong>1,099</strong></td>
</tr>
<tr>
<td>Textile &amp; Fiber Engineering</td>
<td>149</td>
<td>146</td>
</tr>
<tr>
<td>Undeclared</td>
<td>440</td>
<td>430</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5,828</strong></td>
<td><strong>6,180</strong></td>
</tr>
</tbody>
</table>
## Enrollment
(Fall 1998)

### Undergraduate Students
(ME&NE/HP) (excludes co-op students at work)

<table>
<thead>
<tr>
<th>Program</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical Engineering</td>
<td>1076</td>
</tr>
<tr>
<td>Nuclear Engineering</td>
<td>23</td>
</tr>
<tr>
<td>Freshmen</td>
<td>238</td>
</tr>
<tr>
<td>Sophomores</td>
<td>286</td>
</tr>
<tr>
<td>Juniors</td>
<td>249</td>
</tr>
<tr>
<td>Seniors</td>
<td>303</td>
</tr>
</tbody>
</table>

### Graduate Students

<table>
<thead>
<tr>
<th>Program</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical Engineering Masters</td>
<td>246</td>
</tr>
<tr>
<td>Doctoral</td>
<td>185</td>
</tr>
<tr>
<td>Special</td>
<td>3</td>
</tr>
<tr>
<td>Nuclear Engineering and Health Physics</td>
<td></td>
</tr>
<tr>
<td>Masters</td>
<td>31</td>
</tr>
<tr>
<td>Doctoral</td>
<td>22</td>
</tr>
<tr>
<td>Part-time</td>
<td>8</td>
</tr>
</tbody>
</table>

Total: 1,594

### The 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 this program alternate between industrial assignments and classroom studies on a quarterly basis, completing the same course work on the campus that is completed by regular four-year students.

Professional work experience gives cooperative students an opportunity to develop their career interests, and become more confident in their career choices. More than 600 companies, throughout the U.S. and internationally, participate in the program. With average starting salaries close to $11 per hour for students, the aggregate amount earned last year by all Georgia Tech co-ops was close to $22 million.

The Graduate Cooperative Program was established in December 1983 and is currently the largest such program in the U.S. for science and engineering. Eight-hundred thirty two students (106 in 1997-98) have received their graduate degrees with Graduate Co-op Program certificates. Enrollment in the program was 402 during 1997-98, including 157 doctoral students. Summary statistics for the program are provided in the table.

The Job Market

The job market for our graduates continues to be excellent, according to Roger Mobley, Director of Georgia Tech Career Services. However, the sample is small and the salary information below is only through December 1998. Updated information for the complete academic year (Fall 1998 through Summer 1999) is not compiled at this time. We will present that data in the next issue of mega tech, our alumni newsletter.

The average starting salary for a Woodruff School graduate with a bachelor’s degree in mechanical engineering for the period September through December 1998 was $42,543. Although this is a slight decrease from the period June 20, 1997 to July 1, 1998, remember that the data reflect only a small sample of graduates and just one quarter. The average starting salary for a Woodruff School graduate with a master’s degree was $51,800 and for those with a Ph. D. it was $58,000. For the previous academic year the numbers were $48,500 and $59,700 for a master’s and a Ph. D., respectively. Note that there were only seven in the sample size for doctoral recipients, with a low salary of $45,000 and a high of $70,000. (We know of one student who recently received a salary of $92,000 who is not part of the survey.)
Student Organizations and Activities

These organization have active student chapters in the Woodruff School:

American Nuclear Society
American Society of Heating, Refrigerating, and Air Conditioning Engineers
American Society of Mechanical Engineers
Foundry Society
Health Physics Society
Graduate Student Symposium
GT Motorsports/Formula SAE
ME Graduate Students Association
Pi Tau Sigma, Honorary Mechanical Engineering Fraternity
   (note that the national office of Pi Tau Sigma is located at the Woodruff School)
Society of Automotive Engineers
Society of Manufacturing Engineers
Woodruff School Student Advisory Committee
Selected activities of some of these organizations may be found in *The Academic Year in Review*.
Faculty Distinctions

Said Abdel-Khalik won the 1999 ASEE Glenn Murphy Award in recognition of notable professional contributions to the teaching of nuclear engineering students. He served as the Campaign Chairman for the Woodruff School for the 1998-99 charitable campaign. Janet Allen, Research Faculty, was elected vice president for Membership and Conferences of the International Society for the Systems Sciences (ISSS). Daniel Baldwin won the ASME’s Electrical and Electronics Packaging Division’s Young Engineer Award and the 1999 Milton C. Shaw Outstanding Young Manufacturing Engineer Award from the Society of Manufacturing Engineers. Wayne Book was recognized with a Georgia Tech Twenty-Five Year Service Award, and he was elected as the General Faculty Assembly Representative from the School. Bert Bras was selected by the Society of Automotive Engineers to receive a 1999 Ralph R. Teetor Educational Award. Robert Cargill was one of two nominees of the College of Engineering and the National Effective Teaching Institute to attend the 1998 NETI Conference in Seattle. Jonathan Colton was named a Fellow of the ASME. Steven Dickerson is the chairman of both the Georgia Tech Faculty Club and the Machine Vision Association of the Society of Manufacturing Engineers. Iwona Jasiuk received tenure in the Woodruff School. David Ku was named the 1999 Georgia Tech Faculty of the Year by the Graduate Student Senate. Alan Larson was recognized with a Georgia Tech Twenty-Five Year Service Award. Steven Liang was elected to the General Faculty Assembly and the Academic Senate. Robert Nerem received an NSF/ERC award to establish a center in tissue engineering and was elected to a 3-year term on the Council of the National Academy of Engineering. Rick Neu won the Best Presented Paper Award from the ASTM Committee E08 on Fatigue and Fracture. John Papastravidis is the author of *Tensor Calculus and Analytical Dynamics*, published by CRC Press in 1999. Suresh Sitaraman was named Engineer of the Year in Education for 1999 by Metro-Atlanta Engineers Week. Jeff Streator won the 1998 Ruth and Joel Spira Award for Excellence in Teaching. Amyn Teja (joint appointment) became a Fellow in the American Institute of Chemical Engineers. Charles Ume was promoted to full professor in the Woodruff School and he received the 1999 E. G. Bailey Award from the Instrument Society of America. Raymond Vito was recognized with a Georgia Tech Twenty-Five Year Service Award. William Wepfer was named a Fellow of the ASME. Ward O. Winer was selected as the 1998 recipient of the Alumni Society Merit Award for the Department of Mechanical Engineering and Applied Mechanics at the University of Michigan. He was named to the Eugene C. Gwaltney, Jr. Chair in Manufacturing.

Staff Awards

Pete Dawkins Wins Institute Administrative Service Award

Pete Dawkins, Director of Finance for the Woodruff School, was presented the Institute’s Administrative Service Award at the 1999 Faculty/Staff Honors Luncheon. The award is given to honor an individual for making an extraordinary contribution to Georgia Tech in an administrative service capacity.
Rona Ginsberg Wins Institute Outstanding Staff Performance Award

Rona Ginsberg, Director of Publications & Public Relations for the Woodruff School, received an Institute Outstanding Staff Performance Award for 1999. This award was initiated to recognize classified staff members who render outstanding performance in support of instructional, research, or administrative activity.

Nancy Moody, Administrative Manager I, was recognized with a Georgia Tech Ten-Year Service Award.

The Outstanding Classified Employee Achievement Award is awarded quarterly and at the end of the calendar year. At the end of each quarter (now semester) nominations are received from the faculty and staff of the Woodruff School for any classified staff person who has performed in an exceptional manner during that term. A volunteer committee (six members and one tiebreaker) of staff members selects the winner from nominations received from any employee of the Woodruff School.

The 1998 yearly winner was Chelcea Warren and the quarterly winners were: Joyce Jones (F'98), Claudine Nickens (W'99) and Ken Dollar (S'99). Sadly, neither Chelcea Warren nor Joyce Jones are still with the Woodruff School. Previous winners may be found on the staff web pages. View Faculty/Staff.

Staff Promotions

Judy Diamond was promoted to Administrative Assistant I and serves as lead secretary in the SSTC building.
Melody Foster was promoted to Administrative Manager I. She provides administrative and secretarial support to the Chair of the Woodruff School.
Norma Frank was promoted to Academic Advisor I in the undergraduate office.
Becky Hembree was promoted to Administrative Assistant I.
Vivian Johnson was promoted to Administrative Assistant I and moved into the new Institute of Biomedical and Bioscience Building.
Sherron Lazarus was promoted to Administrative Manager I. She provides administrative and secretarial support to the Associate Chair for Administration.
Lisa Manning assumed a new position as Administrative Assistant II and moved into the new Institute of Bioengineering and Bioscience Building.
Cosetta Williams was promoted to Academic Advisor I in the graduate office.

Student Achievements

Saniya Ahsan won the Pi Tau Sigma Outstanding Sophomore Award and the Georgia Tech Alumni Association Student Leadership Award for International Study.
Valerie Bennett won first prize in the GEM Consortium Summer Institute’s First Technical Paper Presentation. She was also recognized as an Outstanding GEM Alumni at the conference.
Charles K. Berkowitz was awarded a Georgia Tech Faculty Women’s Club Scholarship.
Kevin Michael Betts won the School’s Chair Award from the Woodruff School and the Phi Kappa Phi Scholarship Cup.
George "Chip" Butler received the GTA Award.
Robert Dana Carpenter received the Robert Engineering Award.
Justin Collins won the DOE Fusion Science Fellowship.
Carolyn Conner is Georgia Tech’s only Rhodes Scholar. She received her BSME from West Virginia and MS in Economics from Oxford University. Carolyn is also an NSF Fellowship winner.
Rebecca Covert (BSME MIT) came to Georgia Tech with extensive business experience in South America and Asia with HP. She is an NSF Fellowship winner.
Rick Cowan returned from his year in Washington, D.C. as an ASME Congressional Fellow. He was one of 53 fellows to be honored at the 25th anniversary of the ASME Federal Fellows Program, which seeks to bring engineering expertise into key areas of the U.S. government. Rick worked in California Congressman Dana Rohrabacher’s office.
Anh Dang won a U.S. DOE Integrated Manufacturing Fellowship.
Staci Davis received a scholarship from the Atlanta Chapter of the ARCS Foundation (Achievement Rewards for College Scientists).

Ty Dawson won a U.S. DOE Integrated Manufacturing Fellowship.

Rafael deCardenas won a GEM MS Fellowship.

Marnico Deladisma won the Richard K. Whitehead, Jr. Memorial Award.

Charlene Demiel received a GEM MS Fellowship.

Stacey A. Dixon won the Imlay Foundation Scholarship from the ARCS Foundation and received a UNCF-Merck Graduate Science Research Dissertation Fellowship. Stacey was also selected to attend the NSF Workshop for the Retention and Advancement of Underrepresented and Minority Engineering Educators (WEE’99).

Chad Duty won a U.S. DOE Integrated Manufacturing Fellowship and received the award for having the highest score on the Ph.D. qualifying exams.

Dathan Erdahl won a U.S. DOE Integrated Manufacturing Fellowship.

Brett Fennell was recognized as a GEM Ph.D. Fellow.

Dawn Foley received a scholarship from the Atlanta Chapter of ARCS.

Kristine Forsythe received the Society of Women Engineers/General Motors Foundation Graduate Scholarship.

She received her undergraduate degree from the University of Illinois and is spending her first year as a graduate student at Georgia Tech Lorraine.

Jeffrey M. Fowler received the Woodruff School Outstanding Scholar Award, a Phi Kappa Phi Faculty Recognition Award, and an NSF Graduate Fellowship.

Harry Garner won an SAIC Best Paper Award. (Woodruff School graduate students won 4 of the 6 awards given to Georgia Tech students.)

Samuel Graham, Jr. received the Luther S. Long III Memorial Award in Engineering Mechanics.

Heather Gepford was awarded a 1999 American Nuclear Society Graduate Scholarship Award for a student in the field of nuclear science and engineering.

Jonathan Gerhard received an honorable mention in the NSF graduate fellowship competition.

Jeremy Harvey received the Raytheon Ph.D. Fellowship.

Comas Haynes won the NSF/FACES Faculty Coupon Award.

Ping He received a Georgia Tech Faculty Women’s Club Scholarship.

Reginald Hutchinson won a GEM MS Fellowship.

Ashley James received a scholarship from the Atlanta Chapter of the ARCS Foundation.

Sunji Jangha won a DOD NSDEG Fellowship.

Wayne Johnson participated in the Compact for Faculty Diversity’s Institute on Teaching and Mentoring.

Stephanie Kladakis was selected as one of the ASME Graduate Teaching Fellows for the 1999-2000 academic year.

Kristopher Kozak won a DOD NSDEG fellowship. In addition, Kris won an honorable mention in the NSF graduate fellowship competition.

Leonard Lay received an appointment as Dual Degree Engineering Program Coordinator and Lecturer in Engineering at Spelman College.

Tim Charles Lieuwen won the American Institute of AIAA Graduate Student Award and an SAIC Best Paper Award.

Henry Lockett Hutson received the Samuel P. Eschenbach Memorial Award in Mechanical Engineering.

Stacy Imler won an NSF Graduate Fellowship.

Jacqueline Menchaca attended the Institute on Teaching and Mentoring.

Stephen Mewborn received the Georgia Tech Alumni Association Student Leadership Award for International Study.

Brad Miller received the Luther S. Long III Memorial Award in Engineering Mechanics.

Janna Mouw won an NSF Graduate Fellowship.

James Nichols received an honorable mention in the NSF graduate fellowship competition.

Chris Pascual won an Outstanding GTA Award.

Jenelle Piepmeier won the GE Faculty Coupon Award.

Gena Poe participated in the Compact for Faculty Diversity’s Institute on Teaching and Mentoring.

Danielle Rose won a GEM MS fellowship.

Orlando Ruiz attended the Institute on Teaching and Mentoring.

Laura Schaefer received the ASME/ASHRAE Advanced Energy Systems International Conference Best Paper Award.

Andrew Scholand won a U.S. DOE Integrated Manufacturing Fellowship.

Brian Schulz received a GEM MS Fellowship.

Mike Swinson won an NSF Graduate Fellowship, a Department of Defense NSDEG Fellowship, and a GEM Ph.D. Fellowship.

J. D. Thiele won the 1999 Sigma Xi Best Master’s Thesis (Shreyes Melkote, advisor).

Thomas Tucker won the INTEL Fellowship.

Christine Valle was selected to attend the NSF Workshop for the Retention and Advancement of
Ken Veinot received the 1999-2000 Burton J. Moyer Memorial Fellowship from the Northern California Chapter and the National Chapter of the Health Physics Society. He received the Best Student Paper Award in Radiation Detection from the American Nuclear Society, Western Region. (GT students presented seven papers at the meeting.) He also received the 1998 Panasonic TLD Fellowship in External and Environmental Dosimetry.

Michael Woodmansee received an SAIC Best Paper Award.

Adele Wright won an SAIC Best Paper Award and the Best Paper Award at the University System of Georgia Research Symposium.

Nicole Zirkelback was selected to attend the NSF Workshop for the Retention and Advancement of Underrepresented and Minority Engineering Educators (WEE’99).

The NE graduate program was a finalist in the 1998 ANS Student Design Competition. Dr. Stacey taught this class.

President’s Scholars

Since its inception in 1981, the President’s Scholar Program has sought to identify, invest in, and develop students who have demonstrated excellence in both leadership and academia. Some 81 new President’s Scholars entered Tech in August 1999, who were selected from a field of 3,200 students. Financial awards are for four academic years. To continue to receive the scholarship, students are expected to maintain honors-level academic performance and to be involved in campus or community activities.

Beginning with six students in the first year, the program grew to its current size of about 300 current scholars within ten years. More than 640 scholars are now alumni of Georgia Tech. About half have chosen to pursue graduate degrees. Although they comprise only three percent of the student body, President Scholars fill a much larger portion of student leadership positions and receive nearly 30 percent of the awards given at graduation. They also achieve state and national recognition.

In 1994, there were 485 applicants to this highly competitive program. From 1995 to 1999, there were, respectively, 620, 711, 780, 2,743, and 3,228 applicants.

The President’s Scholarship Program is funded entirely by endowments and annual contributions from Georgia Tech’s generous alumni, industry supporters, and other friends through the Roll Call annual giving program.

Woodruff School students currently enrolled as President’s Scholars are: Saniya Ahsan, Josh Bagwell, Jesse Barton, Matt Berrell, Adam Bierce, Brandon Bothe, Mike DeNicola, Justin Disney, Todd Evans, Neha Gandhi, Mike Gootman, Divya Gupta, Justin Hargrove, Jon King, Jeff Kock, Nathan Liddell, Tad Merriman, David Moeller, Erica Onsager, Ryan Reynolds, Lauren Schutz, Horace Smith, Marc Thomas, Damon Underwood, and Lin Woodard.

Tech’s Fab Five

Each year, the U.S. Department of Energy, through the auspices of the National Research Council, awards 12 fellowships for doctoral study to advanced graduate students. Typically, these are students who have just completed or are about to complete their master’s degrees in the area of manufacturing.

This fellowship program has been in existence for seven years. To date, the Woodruff School has had at least one student win each year, with the exception of last year.

This year we hit the jackpot: Five of the 12 winners of the U.S. DOE Integrated Manufacturing Fellowships are Woodruff students. They are: Anh Dang (Dr. Charles Ume, advisor); Ty Dawson (Dr. Tom Kurfess, advisor); Chad Duty (Dr. Jack Lackey, advisor); Dathan Erdahl (Dr. Charles Ume, advisor); and Andy Scholand (Dr. Robert Fulton, advisor).

According to Dr. Bill Wepfer, Associate Chair for Graduate Studies, “this is an outstanding achievement for our graduate students, the mechanical engineering program in the Woodruff School, and for Georgia Tech.” In fact, he refers to these students as “the fab five.”
Alumni Recognitions

One alumnus was inducted into the College of Engineering Hall of Fame at the College of Engineering Alumni Awards Induction Ceremony on October 30, 1998. This designation is the college's most prestigious award and is based on life-long career accomplishments. The alumnus inducted was Jack Zeigler (BME 1948).

Three mechanical and nuclear engineering alumni were honored with selection into the Academy of Distinguished Engineering Alumni of the College of Engineering. The award is intended for alumni who have sustained and made distinguished contributions to Georgia Tech, the profession, or the society at large. The 1998 group included: Jerry M. Hesterlee (BME 1964), Ben W. Latimer (BME 1962), and Thomas L. Williams (BME 1967).

In addition, three of the School's young alumni were inducted into the Council of Outstanding Young Engineering Alumni. Membership is reserved for those individuals under the age of 40 who have distinguished themselves through professional practice and/or service to Georgia Tech. The 1997 group included: Norman F. Bessette, II (MSME 1992, Ph.D. ME 1994), Norman H. Garrett III (BME 1981), and Thomas E. Noonan (BME 1983).

Six Woodruff School Ph.D. alumni have won the prestigious NSF Career Award, which is designed for promising young faculty members. Our alumni winners are: Wei Chen, assistant professor at the University of Illinois at Chicago; Matt Miller, assistant professor at Cornell University; Pam Norris and Susan Carson Skalak, both associate professors at the University of Virginia, Jorge E. Gonzalez, associate professor at the University of Puerto Rico, and Kemper Lewis, assistant professor at SUNY-Buffalo.

During the period from July 1, 1998 to June 30, 1999, Woodruff School students were awarded $2,219,407 in fellowships for graduate study; in 1997-1998 that amount was $2.2 million and in the previous year, $1.52 million. (Note that this year's amount does not include five fellowship students who moved to the new School of Biomedical Engineering, taking with them $165,000 of fellowship funding.) The impressive quality of our graduate students is demonstrated by the presence of 77 Georgia Tech President's Fellows and 72 winners since 1990 of the prestigious National Science Foundation graduate fellowship.

ARCS (Achievement Rewards for College Scientists) Foundation Atlanta Chapter Scholars
Stacey Dixon
Staci Edlund
Dawn Foley
Ashley James
David Wootton

ASHRAE (American Society of Heating, Refrigeration, and Air Conditioning Engineers) Grant-in-Aid
Laura Schaefer

ASME (American Society of Mechanical Engineers) Graduate Teaching Fellowship
Stacey Dixon
Stephanie Kladakis

Department of Energy, Integrated Manufacturing Fellowship
R. Reid Bailey
Matthew Bauer

Department of Energy Health Physics Fellowship
Edward Hoffman (NE)
Jodie Sulak (HP)

Department of Energy Civilian Radioactive Waste Management Fellowship
Michael Scott McKinley (NE)
Scott Mosher (NE)

Ford Foundation Graduate Fellowship
Gena Poe (HP)

Ford Foundation Dissertation Fellowship
Samuel Graham

Fulbright Fellowship
Jan Emblemstevag
Gabriel Hernandez
General Electric Faculty for the Future Doctoral Fellowship
Michael Swinson

GEM (Graduate Education for Minorities) Fellowship
Rafael deCardenes (MS)        Todd Jamison (MS)
Thomas Escoe (MS)             Sundiata Jangha (MS)
Brett Fennell (MS)            Shannon Malcolm (MS)
Christie Gooch (MS)           Patrick Reid (MS)
Ali Gordon (Ph.D.)            Michael Robertson (MS)
Phillip Harp (MS, Ph.D.)      Willie Streeter (MS)

General Motors Fellowship
Pamela Broad
Mark Gaylord

Georgia Tech President's Fellowship
Wayne Johnson
Stephanie Kladakis
Timothy Lieuwen
Josiah Lindsay
Thomas Logan
David Longanbach
Bryan Marshall
Matthew Marston
Lisa Mauck
Robert McGinty
Adam Melch
Jacqueline Menchaca
Bradley Miller
Scott Mosher (NE)
Phillip Nguyen
John Pape
Gene Poe (HP)
Christopher Rinehart
Orlando Ruiz
Laura Schaefer
Brian Schroeter
Timothy Simpson
Stephen Smith
Jason Stammen
Wesley Stone
Michele Sutton
Dana Swalla
Michael Swinson
Benjamin Torres
Thomas Tucker
Bryan Walsh
Nathan Weiland
Stephen Hill
Edward Hoffman (NE)
Andrew Honohan
Stacy Imler
Sundiata Jangha
Daniel Jean
Clifford Johnson

Rex Wolf
David Wootton
Adele Wright
Monifa Wright
Claudia Zettner
Nicole Zirkelback

Glenn Fellowship

Desiree Batth
Brad Beadle
James Campbell (NE)
Derrick Coffin
Sheila Colbert
David Copeland
Thomas Crittenden
Staci Edlund Davis
Ty Dawson
Joseph DeKroon
Michael Drexel
Chad Duty
Brian English
Dathan Erdahl
Brian Gardner
Harry Garner
Heather Gepford (HP)
Jonathan Gerhard
Ali Gordon
Sharon Graf
Samuel Graham
Susan Harp
Comas Haynes
Samuel Heffington
Stephen Hill
Ai-Ping Hu
Sundiata Jangha
Daniel Jean
Thomas Karastamatis

Timothy Lieuwen
David Longanbach
Lisa Mauck
Robert McGinty
Adam Melch
Jacqueline Menchaca
Bradley Miller
Janna Mouw
Jordan Neysmith
Phillip Nguyen
John Pape
Christopher Rinehart
Orlando Ruiz
Griffith Russell
Ryan Rye
Laura Schafer
Brian Schroeter
Charlotte Song
Jason Stammen
Dana Swalla
Andrew Terrell
Benjamin Torres
Mark Trautman
Thomas Tucker
Bryan Walsh
Tracy Williams
Wesley Wolf
Nicole Zirkelback

INPO (Institute for Nuclear Power Operations) Fellowship
Jim Campbell (NE)

INTEL Graduate Fellowship
Ruijun Chen
Kvaerner Fellowship
Yee-Wang Low
Kjartan Pedersen

Merck-UNCF Fellowship
Stacey Dixon

NASA Graduate Fellowship
Frederick Cowan
Andrew Honohan
Wayne Johnson
Josiah Lindsay
Calvin Martin

National Defense Science & Engineering Graduate Fellowship
Richard Cowan
Nathan Weiland

NIH Traineeship
N. Peter Davis
Adele Wright

NSF Graduate Fellowship
Sophia Acle-Jones
John Clayton
Carolyn Connor
Rebeccah Covert
Stephen Hill
Clifford Johnson
Stephanie Kladakis
Matthew Marston

Michael Medaska
Erika Ooten
Laura Schaefer
Timothy Simpson
Jeffrey Thiele
Monifa Wright
Claudia Zettner

NSF Composites Traineeship
Vatsal Bulsara
Samuel Graham

NSF Tribology Traineeship
Susan Harp
Bradley Miller

Panasonic Fellowship
Ken Veinot (HP)

Raytheon Fellowship
Jeremy Harvey

Sloan Foundation Doctoral Fellowship
Ali Gordon
Wayne Johnson
Jacqueline Menchaca
Gena Poe (HP)
Orlando Ruiz

**U.S. Air Force Palace Acquire Fellowship**
Peter Christiansen

**U.S. Air Force Palace Knight Fellowship**
Paul Hausgen
Ryan Morrissey

**U.S. Air Force Traineeship**
Donald Rhymer (MS)
Mark Tudela (Ph.D.)

**U.S. Navy Graduate Study Traineeship**
Brandon Davis
Alexander Dutko
Anne Palmer
Joseph Root
Ryan Stoddard
John Wiggins

**Whitaker Fellowship**
Harris Bergman
N. Peter Davis
Bryan Marshall
David Wootton
Adele Wright

**Woodruff Fellowship**
Desiree Batth (NE)
Brad Beadle
James Campbell (NE)
Peter Carnell
Derrick Coffin
Sheila Colbert
Rebeccah Covert
Jonathan Gerhard
Mark Gillespie
Aaron Graf
Samuel Graham
Comas Haynes
Samuel Heffington
Ai-Ping Hu
Janna Mouw
Phillip Nguyen
John Pape
Gene Poe (HP)
Christopher Rinehart
Orlando Ruiz
Griffith Russell
Ryan Rye
Charlotte Song
Jodi Sulak (HP)
Dana Swalla
Andrew Terrell
Jeffrey Thiele
Mark Trautman
Some of our graduate fellowship winners with Professor Bill Wepfer, Associate Chair for Graduate Studies (standing far right).
Since 1889 when mechanical engineering was the only degree-granting program at Tech, the number and type of degrees awarded has grown. Today, the Woodruff School offers two undergraduate degrees, and nine graduate degrees. In addition, the master’s degree can be completed off-site via video-based instruction or on the Internet.

### Undergraduate Degrees
- Bachelor of Mechanical Engineering (B.M.E.)
- Bachelor of Nuclear and Radiological Engineering (B.N.R.E.)

### Graduate Degrees

#### Mechanical Engineering
- Master of Science in Mechanical Engineering (M.S.M.E.)
- Master of Science (M.S.)
- Doctor of Philosophy (Ph.D.)

#### Nuclear Engineering/Health Physics
- Master of Science in Nuclear Engineering (M.S.N.E.)
- Master of Science in Health Physics (M.S.H.P.)
- Master of Science (M.S.)
- Doctor of Philosophy (Ph.D.)

#### Bioengineering
- Master of Science in Bioengineering (M.S.B.E.)
- Doctor of Philosophy (Ph.D.)

---

**Tech Offers First Internet Master’s Degree in ME**

In fall 1999, Tech became the first university in the nation to offer a master’s degree in mechanical engineering entirely via the Internet. Woodruff School faculty will teach all courses in this pioneering program using state-of-the art streaming audio and video technologies, synchronized slides, simulations, and other multimedia. Internet instruction will include links to other web-based materials. Student-to-student and student-to-faculty interaction will occur using bulletin boards and the threaded discussion capabilities of WebCT.

Students enrolled in Internet classes must meet the same admissions requirements, adhere to the same rigorous academic standards, and will earn the same degree as their on-campus counterparts. Most faculty teaching Internet courses have experience teaching these same courses in video format. Additionally, students will have the flexibility and convenience of being able to take graduate courses in mechanical engineering online, via video, or on campus.

The first two mechanical engineering courses under development for fall semester are Manufacturing Processes and Systems (ME 6222)
taught by Professor Jonathan Colton and Linear Control Systems (ME 6401) taught by Professor Nader Sadegh.

The Spring 2000 courses will be Applications of Thermodynamics (ME 6305) taught by Professor Sam Shelton, and Vibration of Mechanical Systems (ME 6442) taught by Professor Jerry Ginsberg.

Georgia Tech estimates that it will take approximately three years to develop, place online, evaluate, and refine 22 mechanical engineering courses. The courses then will be available online as long as there is demand. Ten of the 22 courses will be required for a master’s degree in mechanical engineering.

"On-line delivery will allow us to improve upon our stature as one of the very best providers of distance-learning master’s degrees in mechanical engineering," said Dr. William Wepfer, Professor and Associate Chair for Graduate Studies in the Woodruff School. "This also will enable Georgia Tech to attract a greater share of young and talented engineers who some day will be the captains of leading high-tech organizations."

The Georgia Statewide Desktop Distance Learning Network, the Sloan Foundation, and Georgia Tech provide funding for the on-line master’s degree in mechanical engineering. For more information, send an e-mail request to web.program@me.gatech.edu or visit Online/Video Programs.

Video-Based Master’s Degree Programs

The Woodruff School continues to be a leader in the delivery of its MSME (mechanical engineering) and MSHP (health physics) programs via video. (Tech’s video program was started in 1977 and has approximately 450 students.) Admission procedures for the School’s video programs are the same as for the on-campus programs. The MSME video program has experienced strong growth since its reinception in Fall 1992. In Fall 1998, there were 53 ME students and 15 HP students enrolled in video courses. The Woodruff School anticipates further growth in its MSME video program as the MSME degree is increasingly perceived as the capstone professional degree in mechanical engineering. Twenty-five new students have been accepted to the video-degree program for fall semester. This is an increase of 60 percent over last year. Forty-five video degrees have been awarded at Georgia Tech from 1998-1999.

To handle the interest in this degree program, we have a special e-mail address: video.programs@me.gatech.edu. In addition, we receive many inquiries through the web page, which contains an online information request form.

For detailed information on graduate programs for working professionals in mechanical engineering and health physics, please view the brochure titled, The George W. Woodruff School of Mechanical Engineering’s Video-Based Master’s Degree Programs.

Georgia Tech in France

Georgia Tech Lorraine (GTL) is a balanced, two-way exchange of American and European Georgia Tech students that began operations in October 1990 with an electrical engineering program. In the fall of 1997, the Woodruff School’s graduate program in Mechanical Engineering began operations at GTL.

The mechanical engineering program offered at GTL, which focuses on the M.S. and the Ph.D. degrees, has the same curricula, and admission and degree requirements as for graduate students in mechanical
engineering attending classes on the Atlanta campus. Primarily, students at GTL are enrolled in a master of science program in mechanical engineering. Students can complete the degree by combining courses taken at GTL, on-campus in Atlanta, or through the video and on-line course offerings.

Graduate students earn their degree from Georgia Tech while studying in France, whereas French students study at their home school and GTL, and receive their degree from both institutions. In addition, U.S. students at GTL have the opportunity to pursue dual-degree programs in collaboration with selected European schools. Georgia Tech has a cooperative agreement with the Ecole Nationale Supérieure d'Arts et Métiers (ENSAM), a leading institution for the study of mechanical and industrial engineering.

The dual-degree program exposes U.S. and French students to an integrated curriculum taught sequentially in France and in the United States over three or four semesters. During the fall semester, U.S. and French students take graduate courses at GTL. Students also begin a research project in the fall, and they work on this project full-time during the spring semester at the ENSAM campus in either Paris or Metz. The projects, jointly advised by faculty at Georgia Tech and ENSAM, are usually performed by two students — one French and one American — and satisfy the ENSAM requirements for the Projet de Fin d'Études. All students spend the following fall semester in Atlanta, and usually continue the research as a master's thesis project.

The courses at GTL are taught in English by professors from Georgia Tech who go to GTL on a rotating basis.

The GTL program is tremendously helpful in the Woodruff School's recruitment of graduate students for the next academic year. The new group consists of nine U.S. students (2 incoming and 2 second year students and 4 ENSAM and 1 ENSIM students). The average GPA of incoming U.S. students is 3.3, and they matriculated from Georgia Tech, Tufts, Cornell, University of Maryland, Penn State, and the University of Delaware.

There is also a GTL summer program for undergraduates. It combines mechanical engineering courses taught on site by Woodruff School faculty with humanities and social sciences courses taught by faculty from other units of the University System.

For more information about the GTL program, see the brochure titled, *Bonjour, Georgia Tech: The George W. Woodruff School of Mechanical Engineering Introduces a Graduate Program for Study in France*, or send an e-mail to gtl@me.gatech.edu.

**Degrees Awarded**

This past academic year, the Woodruff School awarded 241 bachelor's degrees and 158 graduate degrees: 130 master's degrees, and 28 Ph.D. degrees. These graduation numbers place the Woodruff School among the top producers of advanced degrees in mechanical engineering in the country. The table below details the degrees awarded in the Woodruff School this past academic year; next is the breakdown of the bachelor's, master's, and doctoral degrees awarded in mechanical engineering, nuclear engineering, the Schools of the College of Engineering, and the totals in these categories for the Institute from summer 1997 through spring 1999. The next table shows the number of degrees awarded by the College of Engineering for the past academic year; summer 1998 through spring 1999. Following that is a breakdown of the degrees awarded to males and females in the same categories.
Number of Degrees Awarded 1998-1999

Mechanical Engineering
B.M.E. 241
M.S.; M.S.M.E.; M.S.Bio.E. 114
Ph.D. 28

Nuclear Engineering/Health Physics
B.N.E.; B.N.R.E. 0
M.S.; M.S.N.E.; M.S.H.P. 16
Ph.D. 0
Total 399

Degrees Awarded for the College of Engineering
By School for Summer 1998 to Spring 1999

<table>
<thead>
<tr>
<th>Bachelor's Degrees</th>
<th>Master's Degrees</th>
<th>Doctoral Degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace Engineering</td>
<td>50</td>
<td>48</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>142</td>
<td>9</td>
</tr>
<tr>
<td>Civil and Environmental Engineering</td>
<td>168</td>
<td>101</td>
</tr>
<tr>
<td>Electrical and Computer Engineering</td>
<td>341</td>
<td>189</td>
</tr>
<tr>
<td>Industrial and Systems Engineering</td>
<td>302</td>
<td>96</td>
</tr>
<tr>
<td>Materials Science Engineering</td>
<td>19</td>
<td>22</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>241</td>
<td>130</td>
</tr>
<tr>
<td>Textile and Fiber Engineering</td>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td>Totals for COE</td>
<td>1,293</td>
<td>610</td>
</tr>
<tr>
<td>Totals for Institute</td>
<td>2,028</td>
<td>978</td>
</tr>
</tbody>
</table>

Degrees Awarded From 1997 to 1999

<table>
<thead>
<tr>
<th>Bachelor's Degrees</th>
<th>Master's Degrees</th>
<th>Doctoral Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME</td>
<td>274</td>
<td>241</td>
</tr>
<tr>
<td>NE/HP</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>-------</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>COE</td>
<td>1,259</td>
<td>1,293</td>
</tr>
<tr>
<td>Institute</td>
<td>1,912</td>
<td>2,028</td>
</tr>
</tbody>
</table>

### Degrees Awarded to Male and Female Students in 1997-1998 and 1998-1999

#### B.S. Degrees

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Females</td>
<td>Males</td>
<td>Females</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>226</td>
<td>48</td>
<td>201</td>
<td>40</td>
</tr>
<tr>
<td>Nuclear Engineering</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>College of Engineering</td>
<td>961</td>
<td>298</td>
<td>970</td>
<td>323</td>
</tr>
<tr>
<td>Institute</td>
<td>1,393</td>
<td>519</td>
<td>1,412</td>
<td>616</td>
</tr>
</tbody>
</table>

#### M.S. Degrees

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Females</td>
<td>Males</td>
<td>Females</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>80</td>
<td>17</td>
<td>97</td>
<td>17</td>
</tr>
<tr>
<td>Nuclear Engineering</td>
<td>12</td>
<td>4</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>College of Engineering</td>
<td>486</td>
<td>118</td>
<td>500</td>
<td>124</td>
</tr>
<tr>
<td>Institute</td>
<td>724</td>
<td>227</td>
<td>739</td>
<td>239</td>
</tr>
</tbody>
</table>

#### Ph.D. Degrees

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Females</td>
<td>Males</td>
<td>Females</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>24</td>
<td>5</td>
<td>24</td>
<td>4</td>
</tr>
<tr>
<td>Nuclear Engineering</td>
<td>6</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>College of Engineering</td>
<td>154</td>
<td>24</td>
<td>142</td>
<td>21</td>
</tr>
<tr>
<td>Institute</td>
<td>218</td>
<td>45</td>
<td>190</td>
<td>45</td>
</tr>
</tbody>
</table>

**Total Institute**

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2,335</td>
<td>791</td>
<td>2,341</td>
<td>893</td>
</tr>
</tbody>
</table>

### Total Number of Georgia Tech Degrees Awarded for all Commencements

<table>
<thead>
<tr>
<th>Degree</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor's Degrees</td>
<td>82,138</td>
</tr>
<tr>
<td>Master's Degrees</td>
<td>24,848</td>
</tr>
<tr>
<td>Doctoral Degrees</td>
<td>3,855</td>
</tr>
<tr>
<td>Total</td>
<td>110,841</td>
</tr>
</tbody>
</table>
Women and Minorities

The Woodruff School continues to be a leading producer of graduate degrees to women. In 1998-99, four women earned Ph.D. degrees in ME, while 17 earned MS degrees in ME and 6 in HP. Since the 1987 academic year, 41 women have earned Ph.D. degrees from the Woodruff School. In 1998-99, the Woodruff School awarded three Ph.D. degrees in ME to minorities and 12 MS degrees to minorities (10 in ME and 2 in HP). To learn more about our women and minority Ph.D. graduates, request the brochures *Introducing the Minority Ph.D. Graduates From the George W. Woodruff School of Mechanical Engineering at Georgia Tech* and *Presenting the Women Ph.D. Graduates from the George W. Woodruff School of Mechanical Engineering at Georgia Tech*.

Degrees Awarded

First is a compilation of the master’s and doctoral degrees granted by the Woodruff School in summer 1998, fall 1998, winter 1999 and spring 1999. You will find the individual’s name, the degree and the program in which the degree was granted (for example, MSHP is a master’s of science in the health physics program), the student’s advisor, the title of the thesis (or a notation that the student took additional coursework and selected the nonthesis option), and the previous school (in most cases, this is the place where the student received the undergraduate degree) attended. In summer quarter 1998, 34 graduate degrees were awarded. In fall quarter 1998, 35 graduate degrees were awarded, in winter quarter 1999, 37 degrees were awarded, and in spring quarter 1999, 49 degrees were awarded. Following this is a list of all the undergraduates who received their bachelor’s degree.

### Summer 1998 Graduate Degrees

<table>
<thead>
<tr>
<th>Name</th>
<th>Degree / Program</th>
<th>Advisor</th>
<th>Thesis Title</th>
<th>Previous School Attended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biz, Sophie</td>
<td>Ph.D. ME</td>
<td>Drs. William Wepfer &amp; Mark White (ChE)</td>
<td>Synthesis and Characterization of Mesostructured Molecular Sieves</td>
<td>Université de Technologie Compiègne-France</td>
</tr>
<tr>
<td>Boccara, Stephane D.</td>
<td>MSME</td>
<td>Dr. Iwona Jasiuk</td>
<td>An Investigation of Micropolar Moduli and Characteristic Lengths of Heterogeneous Materials and A Reduction of Constants In Plane Elasticity With Eigenstrains</td>
<td>ENSIM Marseille-France</td>
</tr>
<tr>
<td>Braga, Robert W.</td>
<td>MSME</td>
<td>Dr. Harvey Lipkin</td>
<td>The Design of an Automated Creeling Machine for the Carpet Industry</td>
<td>University of Massachusetts at Lowell</td>
</tr>
<tr>
<td>Bright, William B.</td>
<td>MSME</td>
<td>Dr. W.S. Johnson</td>
<td>Nonthesis</td>
<td>United States Air Force Academy</td>
</tr>
<tr>
<td>Bujewski, Edward G.</td>
<td>MSME (V)</td>
<td>Dr. Steven Liang</td>
<td>Nonthesis</td>
<td>North Carolina State University</td>
</tr>
<tr>
<td>Chapman, Matthew T.</td>
<td>MSHP</td>
<td>Dr. Chris Wang</td>
<td>Nonthesis</td>
<td>Georgia Institute of Technology</td>
</tr>
<tr>
<td>Crawford, Kyle A.</td>
<td>MSME</td>
<td>Dr. Wayne Book</td>
<td>Nonthesis</td>
<td>Wichita State University</td>
</tr>
<tr>
<td>Name</td>
<td>Degree</td>
<td>Advisor</td>
<td>Thesis Title</td>
<td>University</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>---------</td>
<td>--------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Crittenden, Thomas M.</td>
<td>MSME</td>
<td>Dr. Ari Glezer</td>
<td>Nonthesis Design Analysis of the Einstein Refrigeration Cycle</td>
<td>Auburn University</td>
</tr>
<tr>
<td>Delano, Andy D.</td>
<td>Ph.D.</td>
<td>Dr. Samuel Shelton</td>
<td>Design Analysis of the Einstein Refrigeration Cycle</td>
<td>Georgia Institute of Technology</td>
</tr>
<tr>
<td>Dye, Mark E.</td>
<td>MSME (V)</td>
<td>Dr. Nader Sadegh</td>
<td>Numerical Study of Platelet Transport in Flowing Blood</td>
<td>Clemson Institute of Technology</td>
</tr>
<tr>
<td>Fiechter, Jerome</td>
<td>MSME</td>
<td>Dr. David Ku</td>
<td>Development of a Hydraulic Bone Chamber Implant to Study In Vivo Bone Repair and Adaptation</td>
<td></td>
</tr>
<tr>
<td>Foust, Richard John</td>
<td>MSME</td>
<td>Dr. Robert Guldberg</td>
<td>Nonthesis Design of an Acoustic Device to Measure Platelet Adherence and Aggregation</td>
<td>Emory University</td>
</tr>
<tr>
<td>Ghosh, Joydeep</td>
<td>MSME</td>
<td>Dr. David McDowell</td>
<td>Nonthesis Laser Ultrasonic Probe for Industrial or High Temperature Applications</td>
<td>University of Alabama</td>
</tr>
<tr>
<td>Gillespie, Mark B.</td>
<td>MSME</td>
<td>Dr. William Black</td>
<td>Local Convective Heat Transfer from Heated Flat Plates Using Synthetic Air Jets</td>
<td>University of Virginia</td>
</tr>
<tr>
<td>Hopko, Sandra N.</td>
<td>Ph.D. ME</td>
<td>Dr. Charles Ume</td>
<td>Laser Ultrasonic Probe for Industrial or High Temperature Applications</td>
<td>University of Alabama</td>
</tr>
<tr>
<td>Hurley, Bridget Anne</td>
<td>MSME</td>
<td>Dr. David Ku</td>
<td>Design of an Acoustic Device to Measure Platelet Adherence and Aggregation</td>
<td>University of Texas</td>
</tr>
<tr>
<td>Hurtado, Jose F.</td>
<td>MSME</td>
<td>Dr. Shreyes Melkote</td>
<td>Experimental Study of Workpiece-Fixture Contact Forces and Friction During Machining</td>
<td>University Technologica-Carabobo</td>
</tr>
<tr>
<td>Kern, Daniel C.</td>
<td>MSME (V)</td>
<td>Dr. Jerry Ginsberg</td>
<td>Nonthesis Crack Detection in Annular Components by Ultrasonic Guided Waves</td>
<td>Georgia Institute of Technology</td>
</tr>
<tr>
<td>Li, Zongbao</td>
<td>Ph.D. ME</td>
<td>Dr. Yves Berthermal</td>
<td>Nonthesis End-Point Position Sensing and Control of Flexible Multi-Link Manipulators</td>
<td>Tennessee Technological University</td>
</tr>
<tr>
<td>Lindsay, Josiah Scott</td>
<td>MSME</td>
<td>Dr. Jianmin Qu</td>
<td>Analysis of Process Yield in Low Cost Flip Chip on Board Assembly Processes</td>
<td>North Carolina A&amp;T University</td>
</tr>
<tr>
<td>McGovern, Lawrence P.</td>
<td>MSME</td>
<td>Dr. Daniel Baldwin</td>
<td>Visualization and Quantification of Left Heart Blood Flow by Phase Encoding Magnetic Resonance Imaging</td>
<td>Worcester Polytechnic Institute</td>
</tr>
<tr>
<td>Milet, Sylvain, F.</td>
<td>Ph.D. BioE</td>
<td>Dr. Ajit Yoganathan</td>
<td>Optical Phase Distortions In a Plane Shear Layer</td>
<td>Université de Technologie</td>
</tr>
<tr>
<td>Palaniappan, Prema</td>
<td>MSME</td>
<td>Dr. Daniel Baldwin</td>
<td>In Process Stress Analysis of Flip Chip Assemblies During Underfill Cure and Environmental Testing</td>
<td>University of Arkansas</td>
</tr>
<tr>
<td>Poe, Gena</td>
<td>MSHP</td>
<td>Dr. Nolan Hertel</td>
<td>Nonthesis Analysis of the Solder Paste Release in Fine Pitch Stencil Printing Processes</td>
<td>Howard University</td>
</tr>
<tr>
<td>Rodriguez, Alain O.</td>
<td>MSHP</td>
<td>Dr. Nolan Hertel</td>
<td>Nonthesis Analysis of the Solder Paste Release in Fine Pitch Stencil Printing Processes</td>
<td>Lenoire-Rhyne College</td>
</tr>
<tr>
<td>Rodriguez, German D.</td>
<td>MSME</td>
<td>Dr. Daniel Baldwin</td>
<td>Analysis of the Solder Paste Release in Fine Pitch Stencil Printing Processes</td>
<td>Universidad de Los Andes</td>
</tr>
<tr>
<td>Rowell, John B.</td>
<td>MSME (V)</td>
<td>Dr. Nader Sadegh</td>
<td>Nonthesis The Development and Validation of an In Vitro Model of Traumatic Brain Injury</td>
<td>Georgia Institute of Technology</td>
</tr>
<tr>
<td>Seliktar, Dror</td>
<td>MSME</td>
<td>Dr. Robert Nerem</td>
<td>Nonthesis Energy Stability of Thermocapillary Convection In Liquid Bridges With a Deformed Interface</td>
<td>Drexel University</td>
</tr>
<tr>
<td>Springer, H. Keo</td>
<td>MSME</td>
<td>Dr. Robert Cargill</td>
<td>Nonthesis The Development and Validation of an In Vitro Model of Traumatic Brain Injury</td>
<td>California State Polytechnic University</td>
</tr>
<tr>
<td>Sumner, Loren</td>
<td>Ph.D. ME</td>
<td>Dr. Paul Neitzel</td>
<td>Nonthesis Energy Stability of Thermocapillary Convection In Liquid Bridges With a Deformed Interface</td>
<td>Georgia Institute of Technology</td>
</tr>
<tr>
<td>Thiele, Jeffrey D.</td>
<td>MSME</td>
<td>Dr. Shreyes Melkote</td>
<td>An Investigation of Surface Generation Mechanisms in Finish Hard Turning of AISI 5200 Steel</td>
<td>Texas A&amp;M University</td>
</tr>
<tr>
<td>Thomas, Terry H.</td>
<td>MSME</td>
<td>Dr. Steven Danyluk</td>
<td>Nonthesis The Effects of Motor Oil Additives on Contact Potential Difference</td>
<td>Abilene Christian University</td>
</tr>
</tbody>
</table>

**Fall 1998 Graduate Degrees**
<table>
<thead>
<tr>
<th>Name</th>
<th>Degree / Program</th>
<th>Advisor</th>
<th>Thesis Title</th>
<th>Previous School Attended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adams, Thomas M.</td>
<td>Ph.D. ME</td>
<td>Dr. Said Abdel-Khalik</td>
<td>Turbulent Convection in Microchannels</td>
<td>Rose-Hulman Institute of Technology</td>
</tr>
<tr>
<td>Bell, David</td>
<td>MSME</td>
<td>Dr. Steven Liang</td>
<td>A Predictive Model for the Concentration of Cutting Fluid That Escapes the Cutting Zone When Turning a Circular Cylinder on a Lathe</td>
<td>Purdue University-West Lafayette</td>
</tr>
<tr>
<td>Beyer, Ted</td>
<td>MSME</td>
<td>Dr. Scott Bair</td>
<td>The Measurement of Diesel Fuel Properties</td>
<td>Cornell University</td>
</tr>
<tr>
<td>Bryson, Larry</td>
<td>MSHP (V)</td>
<td>Dr. Nolan Hertel</td>
<td>Effects of Fiber Spatial Distribution and Interphase on Transverse Damage in Fiber-Reinforced Ceramic Matrix Composites</td>
<td>SUNY-State University at Albany</td>
</tr>
<tr>
<td>Bulsara, Vatsal</td>
<td>Ph.D. ME</td>
<td>Dr. Jianmin Qu</td>
<td></td>
<td>Virginia Polytechnic Institute</td>
</tr>
<tr>
<td>Charras, Guillaume</td>
<td>MS</td>
<td>Dr. Robert Guldborg</td>
<td>Digital Image Based Finite Element Modeling (DIBFEM): Validation and Application to Biological Structures</td>
<td>Ecole Centrale, France</td>
</tr>
<tr>
<td>Chen, Wei</td>
<td>MSME</td>
<td>Dr. Chris Lynch</td>
<td>Nonthesis</td>
<td>Tsinghua University, China</td>
</tr>
<tr>
<td>Cowan, Richard</td>
<td>MSME</td>
<td>Dr. Thomas Kurfess</td>
<td>Adaptive Statistically Based Controller for Through-Feed Centerless Grinding</td>
<td>Georgia Institute of Technology</td>
</tr>
<tr>
<td>Ekberg, Nathanial</td>
<td>MSME</td>
<td>Dr. Said Abdel-Khalik</td>
<td>Two-Phase Flow in Horizontal Thin Annuli</td>
<td>Washington University</td>
</tr>
<tr>
<td>Ezenekwe, Dan E.</td>
<td>Ph.D.</td>
<td>Dr. Kok-Meng Lee</td>
<td>Design Methodology of an Air Bearing System for Multi-DOF Actuator Motion Control Applications</td>
<td>Georgia Institute of Technology</td>
</tr>
<tr>
<td>Garner, Harry</td>
<td>MS</td>
<td>Dr. Kok-Meng Lee</td>
<td>Development of a Grating Interferometer for Non-Contact Relative Displacement Measurement Nonthesis</td>
<td>Harding University</td>
</tr>
<tr>
<td>Douglas Jr.</td>
<td>MS</td>
<td>Dr. Samuel Shelton</td>
<td></td>
<td>University of Iceland</td>
</tr>
<tr>
<td>Gudmundsson, Reynir</td>
<td>MS</td>
<td>Dr. Farrokh Mistree</td>
<td>A Probabilistic-based Design Approach with Game Theoretical Representations of the Enterprise Design Process Nonthesis</td>
<td>University Nacional Autonoma de Mexico</td>
</tr>
<tr>
<td>Hernandez, Gabriel</td>
<td>MS</td>
<td>Dr. Charles Ume</td>
<td></td>
<td>Ecole Nationale Superieure d'Arts et Metiers-Lille</td>
</tr>
<tr>
<td>Jaspart, Philippe</td>
<td>MS</td>
<td>Dr. Shreyes Melkote</td>
<td>Nonthesis</td>
<td>Virginia Polytechnic Institute</td>
</tr>
<tr>
<td>Kelton, Matthew</td>
<td>MSME</td>
<td>Dr. Nolan Hertel</td>
<td>A Health Risk Assessment for the Decommissioning of the Georgia Institute of Technology Research Reactor</td>
<td>Florida State University</td>
</tr>
<tr>
<td>Kielman, Tracy J.</td>
<td>MSHP</td>
<td>Dr. Nolan Hertel</td>
<td></td>
<td>West Virginia Wesleyan College</td>
</tr>
<tr>
<td>Kuhl, Adam Michael</td>
<td>MSME</td>
<td>Dr. Jianmin Qu</td>
<td>A Technique to Measure Interfacial Fracture Toughness</td>
<td></td>
</tr>
<tr>
<td>Lamache Anthony</td>
<td>MS</td>
<td>Dr. Steven Danyluk</td>
<td>Feasibility Study of Single Crystal Silicon Abrasive Waterjet Cutting</td>
<td>Ecole Nationale Superieure d'Arts et Metiers-Aix</td>
</tr>
<tr>
<td>Lauque, Olivier</td>
<td>MS</td>
<td>Dr. Steven Danyluk</td>
<td>Effects of Abrasive Waterjet Erosion on Single Crystal Silicon</td>
<td>Ecole Nationale Superieure d'Arts et Metiers-Bordeaux</td>
</tr>
<tr>
<td>Li, Qingchun</td>
<td>MS</td>
<td>Dr. Jacek Jarzynski</td>
<td>Measurement of Acoustic Properties of Materials Using Torsional Waves</td>
<td>Hefei Associated University, China</td>
</tr>
<tr>
<td>Lõndono, Mateo</td>
<td>MSME</td>
<td>Dr. Steven Dickerson</td>
<td>High-Speed Sub-pixel Edge Measurements Using Systematic, Calibrated Corrections</td>
<td>Florida International University</td>
</tr>
<tr>
<td>Lynn, Charity Michele</td>
<td>MSME</td>
<td>Dr. David Rosen</td>
<td>Accuracy Models for SLA Build Style Decision Support</td>
<td>GMI Engineering &amp; Management Institute</td>
</tr>
<tr>
<td>McLain, Mark</td>
<td>MSME (V)</td>
<td>Dr. Weston Stacey</td>
<td>Nonthesis</td>
<td>Georgia Institute of Technology</td>
</tr>
<tr>
<td>Medaska, Michael K.</td>
<td>MSME</td>
<td>Dr. Steven Liang</td>
<td>The Measurement of Temperature and Forces in a Turning Operation with Cutting Fluid</td>
<td>Pennsylvania State University</td>
</tr>
<tr>
<td>Nicholson, Gail</td>
<td>MSHP (V)</td>
<td>Dr. Nolan Hertel</td>
<td>Nonthesis</td>
<td>Murray State University</td>
</tr>
<tr>
<td>Ray, Atris III</td>
<td>MSME</td>
<td>Dr. William Black</td>
<td>Analytical and Experimental Analysis of Heat Transfer from Current Microelectronics Package Designs Nonthesis</td>
<td>Georgia Institute of Technology</td>
</tr>
<tr>
<td>Repole, Kenzo K.D.</td>
<td>MSME</td>
<td>Dr. Steven Dayluk</td>
<td>Nonthesis</td>
<td>Georgia Institute of Technology</td>
</tr>
<tr>
<td>Simpson, Timothy W.</td>
<td>Ph.D. ME</td>
<td>Dr. Farrokh Mistree</td>
<td>A Concept Exploration Method for Product Family Design</td>
<td>Cornell University</td>
</tr>
<tr>
<td>Smith, Denise</td>
<td>MSHP (V)</td>
<td>Dr. Nolan Hertel</td>
<td>Nonthesis</td>
<td>Wright State University – Dayton</td>
</tr>
<tr>
<td>Name</td>
<td>Degree / Program</td>
<td>Advisor</td>
<td>Thesis Title</td>
<td>Previous School Attended</td>
</tr>
<tr>
<td>----------------------</td>
<td>------------------</td>
<td>--------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>Barre, Vincent Henri</td>
<td>MS</td>
<td>Dr. Richard Neu</td>
<td>Determination of a Local Damage Threshold Criterion for a Glass/Epoxy Laminated Under an Intermediate Rate of Loading</td>
<td>Ecole Nationale Superieure d’Arts et Metiers-Angers</td>
</tr>
<tr>
<td>Belanger, Mitchell</td>
<td>MSHP (V)</td>
<td>Dr. Chris Wang</td>
<td>Nonthesis</td>
<td>University of Minnesota</td>
</tr>
<tr>
<td>Benintendi, Steven</td>
<td>Ph.D. ME</td>
<td>Dr. Marc Smith</td>
<td>Thermocapillary Migration of a Three-Dimensional Liquid Droplet on a Solid Surface</td>
<td>University of Dayton</td>
</tr>
<tr>
<td>Beranger-Fenouillet,</td>
<td>MS</td>
<td>Dr. Yves Berthelot</td>
<td>Nonthesis</td>
<td>Ecole Nationale Superieure d’Arts et Metiers-Aix</td>
</tr>
<tr>
<td>Eric</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bergman, Harris L.</td>
<td>Ph.D. ME</td>
<td>Dr. David Ku</td>
<td>Knowledge-Based Magnetic Resonance Angiography</td>
<td>Washington University</td>
</tr>
<tr>
<td>Biller, Kurt</td>
<td>MSME (V)</td>
<td>Dr. Samuel Shelton</td>
<td>Nonthesis</td>
<td>Rutgers University</td>
</tr>
<tr>
<td>Bilusic, Zrinka</td>
<td>MS</td>
<td>Dr. Raymond Vito</td>
<td>Nonthesis</td>
<td>University of Zagreb, Croatia</td>
</tr>
<tr>
<td>Blasick, Ann Marie</td>
<td>MSME</td>
<td>Drs. Said Abdel-Khalik &amp; Sheldon Jeter</td>
<td>Onset of Flow Instability in Horizontal, Uniformly-Heated Annuli</td>
<td>Wilkes University</td>
</tr>
<tr>
<td>Brewton, Nathan Earl</td>
<td>MSME</td>
<td>Dr. David Ku</td>
<td>Intimal and Medial Alterations Following Balloon Catheter Intervention</td>
<td>Georgia Institute of Technology</td>
</tr>
<tr>
<td>Crudele, Marc</td>
<td>MSME</td>
<td>Dr. Thomas Kurfess</td>
<td>Implementation of a Fast Tool Servo with Repetitive Control for a Diamond Turning Machine</td>
<td>Rensselaer Polytechnic Institute</td>
</tr>
<tr>
<td>Davidson, Ian</td>
<td>MSME</td>
<td>Dr. Wayne Book</td>
<td>Tele-Operation of a Manipulator Using the Internet</td>
<td>University of Florida</td>
</tr>
<tr>
<td>de Vaulx Thomas</td>
<td>MS</td>
<td>Dr. Richard Neu</td>
<td>Determination of the Damage Threshold Criterion of a Glass/Epoxy Composite Material Using An In-Situ Tensile Test</td>
<td>Ecole Nationale Superieure d’Arts et Metiers-Bordeaux</td>
</tr>
<tr>
<td>Ellis, Jeffrey</td>
<td>Ph.D. ME</td>
<td>Dr. Ajit Yoganathan</td>
<td>An In Vitro Investigation of Leakage and Hinge Flow Fields Through Bileaflet Mechanical Heart Valves and Their Relevance to Thrombogenesis</td>
<td>University of Tennessee</td>
</tr>
<tr>
<td>Escoe, Kenneth</td>
<td>MSME</td>
<td>Dr. David Rosen</td>
<td>Nonthesis</td>
<td>North Carolina A&amp;T University</td>
</tr>
<tr>
<td>Evans, James</td>
<td>MSHP (V)</td>
<td>Dr. William Wepfer</td>
<td>Nonthesis</td>
<td>West Virginia University</td>
</tr>
<tr>
<td>Felix, Alejandro</td>
<td>MSME</td>
<td>Dr. Shreyes Melkote</td>
<td>Characterization and Modeling of a Magnetic Workholding Device</td>
<td>ITESM, Mexico</td>
</tr>
<tr>
<td>Ferguson, Lance</td>
<td>MSME (V)</td>
<td>Dr. Steven Danyuk</td>
<td>Nonthesis</td>
<td>Georgia Institute of Technology</td>
</tr>
<tr>
<td>Fort, Emily</td>
<td>MSHP</td>
<td>Dr. Nolan Hertel</td>
<td>A Historical Site Assessment of the Georgia Tech Research Reactor</td>
<td>Guilford College</td>
</tr>
<tr>
<td>Grante, Christian</td>
<td>MS</td>
<td>Dr. William Wepfer</td>
<td>Nonthesis</td>
<td>Chalmers University of Technology, Sweden</td>
</tr>
<tr>
<td>Gurney, Stephen</td>
<td>MSME (V)</td>
<td>Dr. Aldo Ferri</td>
<td>Nonthesis</td>
<td>United States Air Force Academy</td>
</tr>
<tr>
<td>Heidler, Jeffrey</td>
<td>MSME</td>
<td>Dr. Farrokh Mistree</td>
<td>Nonthesis</td>
<td>Virginia Polytechnic Institute &amp; University of Illinois</td>
</tr>
<tr>
<td>Helmick, Daniel</td>
<td>MSME</td>
<td>Dr. Nader Sadegh</td>
<td>Nonthesis</td>
<td>Georgia Institute of Technology</td>
</tr>
</tbody>
</table>

Winter 1999 Graduate Degrees
Johannessen, Per  
Johnson, Clifford  
Khompatraptoporn, Charoenchai  
Lei, Shan  
Li, Yawei  
Livermore, Gregory  
Pastrana, Ryan  
Patel, Sunil  
Pohu, Olivier  
Romagna, Eric O.  
Schwab, Zachary  
Walsh, Bryan P.  
West, Danny  
Wigley, William  
Zhou, Min  

<table>
<thead>
<tr>
<th>Name</th>
<th>Degree / Program</th>
<th>Advisor</th>
<th>Thesis Title</th>
<th>Previous School Attended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alexiou, John</td>
<td>MSME</td>
<td>Dr. Harvey Lipkin</td>
<td>Multibody Dynamics Using Articulated Sub-Chains</td>
<td>Georgia Institute of Technology</td>
</tr>
<tr>
<td>Banks, Julia Michelle</td>
<td>MSHP</td>
<td>Dr. Nolan Hertel</td>
<td>Neutron Shielding Test Stand</td>
<td>North Georgia College &amp; State University</td>
</tr>
<tr>
<td>Baron, Brian</td>
<td>MS</td>
<td>Dr. Jeffrey Streator</td>
<td>Nonthesis</td>
<td>Morehouse College</td>
</tr>
<tr>
<td>Bergh, Charles</td>
<td>MSME</td>
<td>Dr. Charles Ume</td>
<td>Development of an Interferometric System for Process Monitoring</td>
<td>Auburn University</td>
</tr>
<tr>
<td>Brouqueyre, Laurent</td>
<td>MS</td>
<td>Dr. Peter Rogers</td>
<td>Design and Testing of a Hydro-Acoustic Chamber</td>
<td>Ecole Nationale Superieure d'Arts et Metiers</td>
</tr>
<tr>
<td>Brown, Jessica H.</td>
<td>MSME</td>
<td>Dr. Jonathan Colton</td>
<td>Rapid Production System for Composites</td>
<td>Dartmouth College</td>
</tr>
<tr>
<td>Cataldi, Paolo</td>
<td>MSME</td>
<td>Dr. William Weper</td>
<td>Nonthesis</td>
<td>Syracuse University</td>
</tr>
<tr>
<td>Clayton, John</td>
<td>MSME</td>
<td>Dr. David McDowell</td>
<td>Deformation and Damage Evolution of Heterogeneous Materials</td>
<td>Clemson University</td>
</tr>
<tr>
<td>Coffin, Derrick B.</td>
<td>Ph.D. ME</td>
<td>Dr. Pandeli Durbetaki</td>
<td>Effects of Turbulence on Radiation Induced Ignition of Solid Fuels</td>
<td>North Carolina A&amp;T State University</td>
</tr>
<tr>
<td>Davis, Brandon Witt</td>
<td>MSME</td>
<td>Dr. Christopher Lynch</td>
<td>Constitutive Behavior and Reliability of Actuator Materials</td>
<td>United States Naval Academy</td>
</tr>
<tr>
<td>Duncan, Eugenia</td>
<td>MSME (V)</td>
<td>Dr. William Weper</td>
<td>Nonthesis</td>
<td>Georgia Institute of Technology</td>
</tr>
<tr>
<td>Emblemsvåg, Jan</td>
<td>Ph.D. ME</td>
<td>Dr. Bert Bras</td>
<td>Activity-Based Life Cycle Assessment in Engineering Design</td>
<td>Norwegian Institute of Technology</td>
</tr>
<tr>
<td>Foley, Dawn</td>
<td>MSME</td>
<td>Dr. Nader Sadegh</td>
<td>Applications of State Space Realization of Nonlinear Input/Output Difference Equations</td>
<td>Catholic University of America</td>
</tr>
<tr>
<td>Fu, Chia-Yu</td>
<td>Ph.D. ME</td>
<td>Drs. Charles Wepe &amp; David McDowell</td>
<td>Application of ISV Models to Thermal Processing and Reliability of PHTs</td>
<td>National Taiwan University</td>
</tr>
<tr>
<td>Gooch, Christie</td>
<td>MSME</td>
<td>Drs. David Veazie &amp; Jianmin Qu</td>
<td>The Effects of Processing on the Mechanical Properties and Durability of PETI-5 Resins</td>
<td>Georgia Institute of Technology</td>
</tr>
</tbody>
</table>

Spring 1999 Graduate Degrees
Grote, Douglas Lucas MSME Dr. Min Zhou An Experimental Study of the Constitutive and Failure Behavior of Concrete and Mortar Under Impact Loading Georgia Institute of Technology

Hanna, Carlton E. MSME Dr. Suresh Sitaraman Study of the Thermo-Mechanical Reliability of Area-Array Packages Rensselaer Polytechnic Institute

Head, Michael MSME Dr. William Wepfer Modeling the Impact of a Liquid Droplet on a Solid Surface Georgia Institute of Technology

Healy, William Ph.D. ME Drs. Said Abdel-Khalik & James Hartley Nonthesis Cornell University

Jamison, Todd MSME Dr. William Wepfer Design of Gamma-Ray Collimators for Nondestructive Assay Applications University of South Carolina

Jeffcoat, Ron D. MSHP (V) Dr. Chris Wang Material Systems for Rapid Manufacture of Composite Parts Medical College of Georgia

Johnson, Caliph MSME Dr. Suresh Sitaraman Nonthesis Louisiana State University

Johnson, Wayne MSME Dr. Kenneth Cunefare Micro-Cogeneration Optimal Design for Service Hot Water Thermal Loads University of Florida

Jones, Sophia MSME Dr. Samuel Shelton Material Systems for Rapid Manufacture of Composite Parts Georgia Institute of Technology

Christine ACLU MSME Dr. Jonathan Colton Non-Vibrating Kelvin Probe Detection of Monolayer Thick PFPE Lubricant on a Magnetic Disk Surface Harvard University

Kinard, Janet MSME Dr. Jonathan Colton Machining Fixture Layout Synthesis Using the Genetic Algorithm Georgia Institute of Technology

Kladakis, Stephanie MSME Dr. Robert Nerem Thermo-Mechanical Reliability of Area-Array Packages Georgia Institute of Technology

Korach, Chad MSME Dr. Steven Danyluk Machining Fixture Layout Synthesis Using the Genetic Algorithm Georgia Institute of Technology

Koutsak, Maxim MS Dr. Jacek Jarzynski Nonthesis Kazan State University

Kulankara, MS Dr. Shreyes Melkote Nonthess Indian Institute of Technology - Madras

Krishnakumar MS Dr. Jonathan Colton Design of SLA Molds for Plastic Injection Ecole Nationale Superiere

Le Baut, Yann Pierre MS Dr. Jonathan Colton Behavior of a Ni-Ti Shape Memory Alloy Under Cyclic Proportional and Nonproportional Loading Georgia Institute of Technology

Lim, T. Jesse Ph.D. ME Dr. David McDowell Machining Fixture Layout Synthesis Using the Genetic Algorithm Georgia Institute of Technology

Lloyd, Timothy MSME Dr. Thomas Kurfess Material Systems for Rapid Manufacture of Composite Parts North Carolina State University

Melch, Adam MSME Dr. Minami Yoda Nonthesis University of New Haven

Nichita, Eleodor MSHP (V) Dr. William Wepfer Nonthesis University of Bucharest

Palmer, Anne E. MSME Dr. Jonathan Colton The Effect of Feature Geometry on the Life of Stereolithography Molds United States Naval Academy

Pascual, Christopher Ph.D. ME Drs. Said Abel-Khalik & Sheldon Jeter EHD Enhancement of Nucleate Pool Boiling Cornell University

Remley, Timothy James MSME Dr. Said Abdel-Khalik Single-Phase Heat Transfer in a Trapezoidal Channel Florida State University

Rhodes, Matthew MSME Dr. Said Abdel-Khalik Theoretical Modeling of Onset of Ledinegg Flow Instability in Heated Channel Purdue University

Sayoc, Emmanuel MSME Dr. Peter Rogers Use of Hydro-Acoustic Therapy in the Treatment of Patients With Cystic Fibrosis Georgia Institute of Technology

Shafer, David MSME (V) Dr. William Wepfer Synthetic Jets and Their Interaction With Adjacent Jets University of Arizona

Smith, Barton Ph.D. ME Dr. Ari Glezer Fretting Fatigue Damage Prediction Using Multi-Axial Fatigue Criteria Michigan State University

Swalla, Dana MSME Dr. Richard Neu Fretting Fatigue Damage Prediction Using Multi-Axial Fatigue Criteria University of Florida

Swanson, Davin MSME Dr. Wayne Book Dynamic Simulation of an Improved Passive Haptic Display Georgia Institute of Technology

Tambrunini, Diego R. Ph.D. ME Dr. Robert Fulton The Analyzable Product Model to Support Design-Analysis Integration IUPFAN, Venezuela

Torres, Hector MSME Dr. Ben Zinn Nonthesis ITESM, Mexico

Weage, Joshua MSME Dr. Min Zhou A Time-Resolved Analysis of the Rate-Dependent Behavior of PZT Ceramics Michigan Technological University

West, Aaron MSME Dr. David Rosen A Decision Support System for Fabrication Process Planning in Stereolithography North Carolina State University
Undergraduate Degrees Awarded

Summer 1998

Allen, Gregory  
Anderson, Bobby  
Baumer, Brian  
Blumenstein, Michael  
Breitbeil, Fred  
Brown, Kevin  
Brown, Harold  
Casiano, Matthew  
Cook, Daniel  
Crosby, David  
Crunkleton, John  
Daniel, Charles  
Davis, Michael  
Dorsey, James  
Esquerra, Jorge  
Fox, Craig  
Freeman, Stephen  
Gerhard, Jonathan  
Hall, Sacha  
Hannah, Rob  
Hardy, Michael  
Head, Michael  
Jones, Andrea  
Kang, Dae  
Kim, Sophia  
Kinney, Justin  
Larkin, Lance  
Lee, Daniel  
Lokas, Rami  
Mejhirh, Khalid  
Melson, Robert  
Mitchell, Lisa  
Mohamed, Ziad  
Pumphrey, Clayton  
Rains, James  
Renier, Mark  
Reynolds, Brian  
Rohats, Daniel  
Salamone, Joseph  
Sande, William  
Seaton, Mark  
Sharif, Curtis  
Smith, Clayton  
Stoen, Jason  
Suarez, Heath  
Wells, Joel  
White, Monica  
Wyman, Michael  
Yun, Dong

Fall 1998

Alsum, Thaddeus  
Bailliard, Guillaume  
Baird, Geoffrey  
Butler, Deborah  
Byers, Franklin  
Carney, Bradford  
Colletta, Jordan  
Cook, James  
Delrosario, Claire  
Derby, Harry  
Desnoyers, Gavin  
Donovan, Aaron  
Dykstra, Daniel  
Evans, Dave  
Geving, Bradley  
Griffith, Jack  
Harris, Cedric  
Heard, Gregory  
Hierholzer, Michael  
Houston, James  
Huang, Joseph  
Joni, Jeffry  
Kim, Tae  
Laffan, Patrick  
Lebsack, Dale  
Leonardi, Daniel  
Lewis, Sheridan  
Luse, Jason  
McCall, Thomas  
McEntyre, Richard  
McFarland, Jason  
McLendon, Clay  
McNeely, James  
Merine, Mardy  
Miller, Josoeph  
Morgan, Brandon  
Newsome, Justin  
Ninomiya, Renzo  
Parker, Douglas  
Parker, Robert  
Pruitt, John  
Pryor, Loyd  
Reid, Rhonda  
Roach, Jason  
Rundlof, Christi  
Samuelson, Benjamin  
Sand, Jeffrey  
Solanki, Deepen  
Solovay, Corey  
Spielvogel, Michael  
Stuchlik, Pavel  
Williams, Jeremy

Winter 1999
Spring 1999

Akins, Jeffreh
Ansari, Mohammad
Barrera, Vilma
Betts, Kevin
Boehm, Trevor
Bothe, Brandon
Borchartd, Steven
Bush, Kevin
Carroll, Joseph
Carver, Christopher
Cassell, Joel
Chatraw, Aaron
Cherone, Eliot
Cook, Brett
Coon, Mary
Dean, Susan
Demiel, Charlene
Derer, Aaron
Durham, Curtis
Etheridge, Brian
Evans, Patrick
Evans, Douglas
Feinstein, Melissa
Feltus, Robert
Finger, Wesley
Fortgang, Joel
Fowler, Jeffrey
Franz, Monica
Geiter, Daniel
Germann, Christopher
Goh, Sharon
Gray, Stephen
Haldimann, Ryan
Hall, Melissa
Hallam, Remy
Hamler, Jesse
Hardin, Sedjenane
Harp, Quincy
Harrison, Reuben
Hatch, Stephen
Haverkamp, Paul
Hawes, John
Hebert, Michael
Herrington, Jill
Hoffmaster, Jill
Hutchinson, Reginald
Hutson, Henry
Isaac, Elizabeth
Israelov, Roni
Karamesic, Amel
Kharza, Kasem
Kinnick, Suzanne
Kirchner, Matthew
Kozak, Kris
Kronen, Erica
Kubik, Kenneth
Le, Thai
Leason, Malcolm
Leonard, Lovella
Leung, Hon
Lewis, John
Lin, Angela
Lindell, Tamara
Maier, Jonathan
Malanowski, Susan
McCammish, Charles
Morrison, Robert
Moore, Sandra
Nichols, James
O'Toole, Daniel
Paz, Eric
Perez-Del-Rosario, Karina
Pham, Giang
Pierce, Melinda
Piper, Joshua
Platten, Andrew
Richards, Nicole
Rodriguez, Roberto
Rose, Danielle
Sabold, Bret
Sanborn, Edwin
Sanders, Jonathan
Schulz, Brian
Segal, Gregory
Sin, Matthew
Slack, Andrew
Soderlund, Matthew
Starr, Scott
Stowers, Miki
Swinkola, Brian
Sydell, Jarrett
Thomas, Matthew
Toas, Samuel
Toledo, Eric
Tous, Liliana
Van Dellen, David
Vittur, Shannon
Wagner, Douglas
Wallace, Jon
Watson, Elton
Weissman, Benjamin
Williams, Jason
Wolfson, Mark
Wood, Gregory
The Woodruff School maintains a vigorous publication schedule and a rigorously updated web page. All of our publications are maintained in two versions: print and online. We publish brochures, dedications, handbooks, invitations, newsletters, programs, reports, and transcripts. You may ask for a hard copy of our most recent publications or view them first online at Publications. Copies of most of our older publications are also kept in stock. In addition, our web page, an ever-changing publication, is updated frequently, often daily.

Major publications during the past academic year are: Research in the George W. Woodruff School of Mechanical Engineering; 1999-2000 editions of the Undergraduate Handbook in Mechanical Engineering and Nuclear and Radiological Engineering; Graduate Handbook in Mechanical Engineering; and Graduate Handbook in Nuclear Engineering and Health Physics; the 1999 versions of the George W. Woodruff Distinguished Lecture invitation and the Harold W. Gegenheimer Lecture on Innovation; the new, 16-page issue of our alumni newsletter, megatech; programs for some special events, such as the Heimlich Lecture, the Woodruff Distinguished Lecture, and the 50th Anniversary Celebration for Regents' Professor Emeritus Mario J. Goglia; The 1998-1999 Annual Report of the George W. Woodruff School of Mechanical Engineering (this report); and the transcript of the 1999 Woodruff Distinguished Lecture.

The Woodruff School’s Web Site
http://www.me.gatech.edu
The School’s web site has undergone a number of significant changes in the past academic year particularly the addition of an on-line Woodruff lecture. We changed the undergraduate and graduate programs pages, added a page for video and online programs, and kept the entire site current.

A copy of our home page is printed here to offer our readers a sense of the breadth of the on-line coverage. Use the Search button to search the Woodruff School web page by keyword descriptor. View the Facilities page to check the progress on the new MRDC II building. Go to Theses to get an archival record of all master’s and doctoral theses. By using on-line features we are slowly decreasing the number of paper copies that we produce. The undergraduate and graduate handbooks, the entire semester curriculum, and some course material can be viewed.

All publications produced since 1997 are found in Publications. We are also adding new graphics to the page and expanding the photo gallery.

Since the first edition of the School’s web site in April 1996, there have been almost 300,000 hits to the page.
FINANCES

For fiscal year 1999 (July 1, 1998 to June 30, 1999), 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. These categories break down as given below. Detailed information on any of these categories is available from the School's Director of Finance, Pete Dawkins, at (404) 894-7400.

Grants and Contracts

Total new funds received on external/internal grants and contracts active during fiscal year 1999 (includes endowment revenue) $24,564,698
Endowment and externally funded grant and contract expenditures a $19,404,892
Internally funded grant expenditures b $668,007
Total grant, contract, and endowment expenditures $20,072,899

Number of Grants, Contracts, and Proposals

Total number of active (external/internal) grants and contracts (includes endowment accounts) 495
Number of proposals submitted to external agencies 153
Number of externally funded grants, contracts, and endowments receiving new funds 245
Number of internally funded grants receiving new funds 27

School Budget

State support $9,672,881
Sponsored grant support c $14,897,207
Total budget $24,570,088

Endowments

Total endowment (market value principal) $61,617,117
Endowment-generated revenue available for expenditure $2,275,972
a Includes direct costs, fringe benefits, and overhead, where applicable.
b Includes direct costs and fringe benefits (overhead, if applicable).
c Includes direct costs but not overhead.
THE WOODRUFF ENDOWMENT

Funds from the George W. Woodruff Trust continue to provide for the enhancement of School of Mechanical Engineering. George W. Woodruff received his degree in mechanical engineering in 1917. He 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, 1998 was $48,213,064. The endowment generated $1,776,066 that was available to the Woodruff School to update and enrich our programs. The expenditures may be categorized as follows: faculty, students, facilities, lectures and seminars, staff, publications, and general projects and supplies. A specific breakdown of the use of these funds includes:

Faculty

Funds from the Woodruff Trust are used to endow the George W. Woodruff Chair in Mechanical Systems. This chair is held by Dr. Jerry H. Ginsberg, Professor of Mechanical Engineering and the recipient of the 1998-99 Archie Higdon Award from the Mechanics Division of the American Society of Engineering Education for being a distinguished educator.
Funds developmental leaves for faculty.
Funds the Woodruff Faculty Fellows Program, which encourages young professors to build their careers at Georgia Tech by providing seed money ($10,000) for research projects and other discretionary activities. The award is given for a five-year period. In the past academic year, the faculty fellows were: Kok-Meng Lee, Steven Liang, Jianmin Qu, and Cheng Zhu.
Partially supports the School's participation in the Georgia Tech Lorraine Program.
Provides funds for the yearly Faculty Retreat.

Students

During the course of the academic year, approximately 205 graduate student quarters were funded for research and teaching assistants in the Woodruff School; they receive an average rate of $3,500 a quarter.
Awards Woodruff Graduate Fellowships to outstanding Ph.D. students; currently there are 41 holders of these fellowships. See Fellowships for a listing of these students.
Provides funds for the Woodruff Doctoral Teaching Program, which enables graduate students interested in academic careers to team-teach with a senior faculty member; six graduate students (Stacey Dixon, Brian Gardner, Francois Guillot, Robert McGinty, Laura Schaefer and Adele Wright) participated in this program in the past academic year.
Provides funds to recruit new graduate students to the Woodruff School.
Gives money for the ME Spring Banquet, a yearly gathering of students, staff, and faculty to recognize the accomplishments of Woodruff School students and to honor the Woodruff School’s Annual Distinguished Alumnus.
Partially funds the GT Motorsports competition.
Provides funds for the Résumé Book, a yearly presentation of the résumés of doctoral students at the School who are close to finishing their degree and are seeking employment.
Financial support may be provided to participants in the Georgia Tech Lorraine program.

Facilities

Funds for general provisions for various research labs.
Provides funds to improve and furnish School facilities.
Provides funds to obtain remote access for faculty, staff, and some graduate students.
Funds a hospitality suite and an exhibition booth at the American Society of Mechanical Engineers (ASME) National Meeting in Anaheim, California.

**Lectures/Seminars**
Funds activities associated with the the Annual Woodruff Distinguished Lecture Series.
Provides support for the Woodruff Seminar 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.

**Publications and Public Relations**
The following publications were made possible under the endowment: The 1998-1999 Annual Report of the Woodruff School of Mechanical Engineering (this report); the Invitation to the 1998 Harold W. Gegenheimer Lecture Series on Innovation; two issues (fall and spring) of Mechanical Engineering News (the student newsletter of the Woodruff School Student Advisory Committee); 1998 Program for the Gegenheimer Lecture; The Résumé Book (Résumés of the 1998-1999 Doctoral Candidates in Mechanical Engineering and Nuclear Engineering/Health Physics); the transcript of the 1998 Woodruff Distinguished Lecture; mega tech (the Woodruff School newsletter for alumni); the Invitation and Program for the 1999 Woodruff Distinguished Lecture.
Funds the Woodruff School’s mechanical engineering and nuclear engineering pages in the Peterson’s Guide to Graduate Schools.
Photographic sessions in various Woodruff School faculty laboratories and research sites and photography for various School events.
Procurement of the Woodruff School mouse pads for recruiting purposes.

**Miscellaneous Projects**
Provides funds for the Woodruff School Advisory Board meetings.
Funds for the design and production of tee-shirts for new and potential graduate students.
Provided travel support for faculty and students to attend the GTL program in France; also provided funds for Michael Wileman, Academic Professional, to work at GTL to administrate and interact with the French schools in the dual-degree program.
Provided funds to research and prepare the nomination of the Woodruff School as an ASME Mechanical Engineering Heritage Site. This included the help of a graduate student assistant for two quarters.
Funds to improve office equipment.
Gives money to maintain the Pi Tau Sigma (the mechanical engineering honorary organization) National Office.
Provides money to furnish faculty, staff, and graduate student offices.
Provides support to purchase computers for offices and laboratories.
Funds for the preparation and installation of all the display cases in MRDC-I.
Funds for two pedestal displays, including the 1918 catalog and the distinctions and patents of the faculty.

**Training**
Funds for both off-site and on-site staff training programs.
WHERE WE STAND - RANKINGS

The prominence of the Institute is exhibited in the recent rankings that Georgia Tech has accrued. "We are extremely proud of the breadth of quality in our rankings," said Wayne Clough, president of Georgia Tech.

- U. S. News & World Report 1999 ranking of "America's Best Colleges" ranked Georgia Tech 10 overall (up from 13 in 1998) of 147 public universities and 40th (up from 46th in 1998) of all 228 national (public and private) research universities.


- Black Issues in Higher Education annual "Top 100" list Georgia Tech maintains its number one ranking (tied with Stanford) in engineering doctoral degrees awarded to minority students, and a number two ranking in engineering bachelor's and master's degrees awarded to minorities.

- Kiplinger's Personal Finance magazine ranked Georgia Tech 9th in their "Top 100 Values in State Universities" survey.

- In 1999, U.S. News & World Report ranked the College of Engineering 3rd in the nation for its graduate programs; ranked the Woodruff School of Mechanical Engineering 7th for its graduate programs.

- Money magazine's "Best Value Rankings" lists Georgia Tech as 2nd among scientific and technology schools and the 18th "Best Buy" among public universities.

- The National Science Foundation ranks Georgia Tech 8th in industry sponsored research.

- Georgia Tech's College of Engineering has the 2nd largest group of NSF graduate fellowship winners in the country.

- Georgia Tech's engineering program was ranked 2nd by practicing engineers in U. S. News and World Report.

- Georgia Tech ranks 6th in the nation for the amount of research conducted for private industry. Approximately 40% of the research performed in the Woodruff School is funded by industry.
THE CAPITAL CAMPAIGN

THE CAMPAIGN FOR GEORGIA TECH

It is my special privilege to serve Georgia Tech at this historic moment and to be the first alumnus as its president. The years remaining in the twentieth century provide me, my fellow alumni, and other friends of the Institute with the opportunity to build the foundation for the unprecedented success in the twenty-first century.

G. Wayne Clough, President
from his letter to launch the Campaign for Georgia Tech in the spring of 1996

ME Tops $23 Million

The Woodruff School of Mechanical Engineering has raised more than $23 million toward its $30 million Campaign goal. This amazing progress has been attained during the first four years of The Campaign for Georgia Tech: The Threshold of a New Era. Corporate contributors have been generous, making up 25.5 percent of the $23.1 million total.

Opportunities abound to create a new era for the Woodruff School. The top priority is adding endowed chairs to attract and retain eminent faculty. Making a permanent mark on the School through a naming opportunity provides visible recognition for posterity. Scholarships, fellowships, and instructional laboratories round out the top five priorities. The School’s Campaign Council is led by Parker H. "Pete" Petit. Other Council members include: Tom Barrow, Honorary Chair Paul Duke, G.B. Espy, Robert Hill, Bob Millikan, Charles Ray, Oliver Sale, and Larry Ybarondo. The faculty representatives are Gene Colwell and Sam Shelton.

For a full briefing on our goals and progress, please call Caroline Gaines Wood at 404-894-0762.

WOODRUFF SCHOOL GETS A NEW CHAIR
The Ramirez/HUSCO International Distinguished Chair in Fluid Power Systems has been established by Mr. Agustin A. Ramirez (AE '68). Mr. Ramirez’s gift consists of a pledge of $1,875,000 to the Georgia Tech Foundation of which $375,000 is to fund a fluid power lab and $1,500,000 to endow the chair in the Woodruff School of Mechanical Engineering. 

Mr. Ramirez is Chairman and CEO of HUSCO International, a major manufacturer of hydraulic and electrohydraulic controls for mobile equipment in the construction, materials handling, agriculture, and automotive markets. The corporate headquarters is in Waukesha, Wisconsin. HUSCO International has manufacturing plants and sales facilities in Europe and the Pacific Rim as well as manufacturing affiliates in several countries.

While funding for the laboratory is well on its way, additional funds for equipping and operating the laboratory are being sought from the fluid power industry. Once that is complete, a search committee will be formed to fill the chair.

According to Dr. Ward Winer, Eugene C. Gwaltney, Jr. Chair in Manufacturing and Chair of the Woodruff School, "The chair will allow Tech to retain an eminent scholar in a field that has relatively little presence in American engineering education, yet is a crucial technology for aerospace, automotive, off-highway equipment, machine tools and other machinery businesses. We will be studying similar programs in Germany, England, and Sweden in order to structure ours in a way that will provide the most for our students and provide a really critical resource of expertise for U. S. industry."

Mr. Ramirez is a graduate of Georgia Tech’s aerospace engineering school (BS and MS) and Harvard University (MBA). He is a past chairman of the National Fluid Power Association, a past Wisconsin Entrepreneur of the Year recipient, and serves on numerous nonprofit and public company boards. He engineered a management buyout of HUSCO in 1985 and the company’s 700% growth since then has resulted in market leadership in North America, Europe, and Japan (through its affiliates).

Tech Receives Boost From Ford
Georgia Tech received a check for $661,000 from the Ford Motor Company. The check is the first installment of a $3.4 million grant to be used over the next five years for student scholarships and other initiatives. Barrett Carson (seated) Vice President of Development looks on as Frank Taylor, Ford’s corporate sponsor, endorses a "mock" check on behalf of the company. Frank Taylor is the executive director of Material Planning and Logistics for Ford Motor Company, and the corporate sponsor of Ford’s partnership with Georgia Tech. The Woodruff School will use its share of the money to build two more anechoic chambers — part of its Integrated Acoustics Laboratory.

Pictured (l to r): John Jarvis, Chair of ISyE, Lee Bennett and Doug Monk (IE ’68), both from the Bonnell Company and Ward Winer, Chair of the Woodruff School. A check in the amount of $75,000 was given to establish the Bonnell Scholarship Program to be split between the Woodruff School and the School of ISyE. The Bonnell Company consists of a number of business enterprises; the largest is the aluminum extrusion business, with four plants each in the U. S. and Canada. The company is one of the largest employers in the Newnan area and they need mechanical engineers to help in setting up technology, for the best utilization of existing equipment, and for their capital improvement projects.
This list includes donors who have designated gifts to the Woodruff School since the Campaign for Georgia Tech began on July 1, 1995.

**Alumni and Friends**

- Nelson D. Abell, ME’44
- John H. Adams, ME’66
- T’Lene B. and Joe H. Anderer, ME’47
- Gilbert A. Bachman, ME’46
- Jim R. Borders, ME’83
- Melvin W. Carter, CE’49
- Phyllis H. Clack, Friend
- Mr. and Mrs. George Clem, Friend
- Mimms I. Cleveland, ME’47
- Charles M. Davis, IM’55
- Minnie E. Dean, Friend
- Leslie E. Delgrosso, Friend
- Jan Emblemsvag, MS’95
- Dorothy R. Eschenbach, Friend
- George W. Fleming, Jr., ME’47
- Mr. and Mrs. John J. Gasser, Sr., Friend
- Harold W. Gegenheimer, ME’33
- Thomas A. Glaze, IE’70
- Jack F. Glenn, ‘59
- Christopher F. Hammond, ME’34
- J. Charles Headrick, ME’71
- Robert G. Hill, ME’58
- Mr. and Mrs. William P. Hynish, Friend
- Virginia F. Jackson, Friend
- Mr. and Mrs. Douglas R. Johnson, Friend
- John G. Johnson, ME’59
- Mr. and Mrs. Patrick Johnson, Friend
- William S. Johnson, Sr., ChE’45
- Kevin C. King, Friend
- Wayne H. Knox, ME’73
- James C. Leathers, ME’55
- Catherine A. Lill, Friend
- David Lowell, ME’91
- Mr. and Mrs. Ellis MacDougall, Friend
- Helen K. Maddox, Friend
- Kathleen L. Maher, ME’83
- J. R. Markley, ME’56
- Clinton S. Mathews, ME’63
- Rob J. Millikan, ME’59
- Isaac E. Murray, Jr., ME’49
- Ronald E. Ohl, Friend
- Carter N. Paden, Jr., ME’51
- Lorine Payne, Friend
- Doris Peterson, Friend
- Parker H. Petit, ME’62
- Agustin A. Ramirez, AE’68
- Charles L. Ray, Jr., ME’70
- Barbara Eschenbach Ruddy, Friend
- Cecila D. Smith, IMGT’79
- Joel S. Spira, Friend
- William L. Thacker, ME’67
- Harvey Toub, Friend
- Mr. and Mrs. T. C. Trivers, Friends
- Mr. and Mrs. William E. Trumbo, Friends
- Kam Chuen Tse, CE’71
- Hal B. Tucker, EE’49
- Carlos E. Vidales, ME’77
- Frank K. Webb, ME’38
- Thomas F. Williams, Jr, ME’50.
- Wendell M. Williams, Jr., ME’55
- James E. Winer, ARCH ‘82
- Jack M. Zeigler, ME’48
- Mr. and Mrs. Gary D. Zweifel, Friend
- Anonymous (5)
Faculty and Staff Contributors

Janet Allen
L. Dennis Ballou
Yves H. Berthelot
William Z. Black
Wayne J. Book
Berdinus A. Bras
James W. Brazell
T. E. Clopton
Jonathan S. Colton
Gene T. Colwell
Steven Danyluk
Royal F. Dawkins
Prateen V. Desai
Stephen L. Dickerson
Kenneth Dollar
Geoffrey G. Eichholz
Robert E. Fulton
Jerry Ginsberg
Rona Ginsberg
Robert Guldberg

James G. Hartley, ME’77
Catherine C. Inabnit
Sheldon M. Jeter
Bernd Kahn
Alan V. Larson
Mian Long
David L. McDowell
Farrokh Mistree
E. Kathleen Neitzel
G. Paul Neitzel
Robert M. Nerem
Connie C. Parish
Jianmin Qu
Peter Rogers
Raymond P. Vito
Cheng Wang
William J. Wepfer
Wendell M. Williams, Jr., ME’55
Ward O. Winer
Caroline G. Wood

Corporate and Foundation Contributors
<table>
<thead>
<tr>
<th>Company/Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>3M Corporation</td>
</tr>
<tr>
<td>Abatement Technologies</td>
</tr>
<tr>
<td>Advanced Tissue Sciences</td>
</tr>
<tr>
<td>Aerospace Industries Associations</td>
</tr>
<tr>
<td>Alcoa Foundation</td>
</tr>
<tr>
<td>Allied Signal, Inc.</td>
</tr>
<tr>
<td>Allison Engine Company</td>
</tr>
<tr>
<td>American Heart Association</td>
</tr>
<tr>
<td>American Nuclear Society</td>
</tr>
<tr>
<td>American Performance Parts Warehouse</td>
</tr>
<tr>
<td>American Society of Mechanical Engineers</td>
</tr>
<tr>
<td>Amoco Foundation, Inc.</td>
</tr>
<tr>
<td>AMP Circuits</td>
</tr>
<tr>
<td>Applied Medical Resources</td>
</tr>
<tr>
<td>ARCS Foundation, Inc.</td>
</tr>
<tr>
<td>AT&amp;T</td>
</tr>
<tr>
<td>Atlanta Market Center</td>
</tr>
<tr>
<td>Audio Engineering Society Education Foundation</td>
</tr>
<tr>
<td>Automated Systems International, Inc.</td>
</tr>
<tr>
<td>Babcock &amp; Wilcox</td>
</tr>
<tr>
<td>Baldwin Technology Company, Inc.</td>
</tr>
<tr>
<td>C. R. Bard, Inc.</td>
</tr>
<tr>
<td>Bard Urological Society</td>
</tr>
<tr>
<td>BASF Corporation</td>
</tr>
<tr>
<td>Baxter Healthcare Corporation</td>
</tr>
<tr>
<td>Boeing Defense &amp; Space Group</td>
</tr>
<tr>
<td>BW/IP International, Inc./Seal Division</td>
</tr>
<tr>
<td>Camotion, Inc.</td>
</tr>
<tr>
<td>CarboMedics, Inc.</td>
</tr>
<tr>
<td>Chevron USA</td>
</tr>
<tr>
<td>Chrysler Corporation</td>
</tr>
<tr>
<td>Con-Tek Valves, Inc.</td>
</tr>
<tr>
<td>CR Industries</td>
</tr>
<tr>
<td>Cummins Engine Company, Inc.</td>
</tr>
<tr>
<td>David &amp; Ruth Coleman Charitable Foundation</td>
</tr>
<tr>
<td>Dickerson Vision Technologies, Inc.</td>
</tr>
<tr>
<td>Digital Equipment Corporation</td>
</tr>
<tr>
<td>Dow Chemical Company Foundation</td>
</tr>
<tr>
<td>Duke Energy Corporation Foundation</td>
</tr>
<tr>
<td>E.I. du Pont de Nemours and Company</td>
</tr>
<tr>
<td>Eastman Kodak Company</td>
</tr>
<tr>
<td>Emory University</td>
</tr>
<tr>
<td>Engelhard Corporation</td>
</tr>
<tr>
<td>Georgia Power Company</td>
</tr>
<tr>
<td>Grandview Foundation, Inc.</td>
</tr>
<tr>
<td>Greater Augusta Community Foundation., Inc.</td>
</tr>
<tr>
<td>Harris Foundation</td>
</tr>
<tr>
<td>Hitch House LLC</td>
</tr>
<tr>
<td>Hoechst Celanese Corporation</td>
</tr>
<tr>
<td>Hughes Aircraft Company</td>
</tr>
<tr>
<td>HUSCO International</td>
</tr>
<tr>
<td>Institute of Real Estate Management</td>
</tr>
<tr>
<td>Johnson &amp; Johnson</td>
</tr>
<tr>
<td>Kulicke &amp; Soffa Industries, Inc.</td>
</tr>
<tr>
<td>Kvaerner Singapore</td>
</tr>
<tr>
<td>Levenson Foundation, Inc.</td>
</tr>
<tr>
<td>Little Tree Orchards</td>
</tr>
<tr>
<td>Lubrizol Corporation</td>
</tr>
<tr>
<td>Lucent Technologies</td>
</tr>
<tr>
<td>Lutron</td>
</tr>
<tr>
<td>Marion Merrell Dow, Inc.</td>
</tr>
<tr>
<td>Medtronic, Inc.</td>
</tr>
<tr>
<td>Milliken &amp; Company, Inc.</td>
</tr>
<tr>
<td>Mobil Foundation, Inc.</td>
</tr>
<tr>
<td>National Electrical Carbon Corporation</td>
</tr>
<tr>
<td>NEC Corporation</td>
</tr>
<tr>
<td>O'Neal Steel, Inc.</td>
</tr>
<tr>
<td>Pi Tau Sigma</td>
</tr>
<tr>
<td>Plastech Corporation</td>
</tr>
<tr>
<td>Procter &amp; Gamble Company</td>
</tr>
<tr>
<td>Psiphics Technologies, Inc.</td>
</tr>
<tr>
<td>Racing Communications</td>
</tr>
<tr>
<td>RELTEC</td>
</tr>
<tr>
<td>Schlumberger Foundation, Inc.</td>
</tr>
<tr>
<td>Scientific-Atlanta, Inc.</td>
</tr>
<tr>
<td>Shaped Wire, Inc.</td>
</tr>
<tr>
<td>Shell Oil Company Foundation</td>
</tr>
<tr>
<td>SME Manufacturing, Engineering</td>
</tr>
<tr>
<td>Education Foundation</td>
</tr>
<tr>
<td>Square D. Foundation</td>
</tr>
<tr>
<td>St. Jude Medical, Inc.</td>
</tr>
<tr>
<td>Star Enterprise</td>
</tr>
<tr>
<td>SulzerMedica</td>
</tr>
<tr>
<td>Texaco Foundation</td>
</tr>
<tr>
<td>Timken Company</td>
</tr>
<tr>
<td>Torrington Company</td>
</tr>
<tr>
<td>Company Name</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>Equifax Foundation</td>
</tr>
<tr>
<td>Exxon Company, USA</td>
</tr>
<tr>
<td>Fisher Controls International, Inc.</td>
</tr>
<tr>
<td>Ford Motor Company</td>
</tr>
<tr>
<td>Foundation For The Carolinas</td>
</tr>
<tr>
<td>Fulton Ventures, Inc.</td>
</tr>
<tr>
<td>General Motors Corporation</td>
</tr>
<tr>
<td>Georgia Association of Fire Chiefs, Inc.</td>
</tr>
</tbody>
</table>

Table of Contents
The Woodruff School Advisory Board meets once a year, usually in the fall. Members are invited to join the Board so that its composition reflects the varied scope of mechanical engineering in industry, the health-related professions, and the academic community. The purpose of the Advisory Board is to recommend strategic direction for the School, suggest broad-based curriculum revisions, and consult with the Chair and faculty on issues that are important to the Woodruff School.

Two areas of interest to the Board this year were the Regents’ mandated conversion of the Georgia Tech calendar from quarters to semesters in fall 1999 and the development of a new strategic plan for the Woodruff School. The advisory board meeting was convened in October 1998.

For the first time, we scheduled the Gegenheimer Lecture on Innovation a day before the Advisory Board meeting. This gave us the opportunity to have a dinner to honor the members of our advisory board, Harold Gegenheimer, and the representatives from the Baldwin Technology Company. This event was so successful that we are scheduling the same plan for this year’s meeting.

Members of the Board

Mr. Kerry E. Adams (’58)
Executive Vice President
Southern Company Services Inc.
Birmingham, Alabama

Mr. Cary D. Baldwin (’67)
Manager
Pratt & Whitney
West Palm Beach, Florida
Dr. David B. Bogy  
Chairman, Dept. of Mechanical Engineering  
University of California - Berkeley  
Berkeley, California

Mr. James R. Borders ('83)  
President, Novare Group  
Atlanta, Georgia

Dr. James D. Brock ('63,'65)  
Chairman & CEO  
ASTEC Industries  
Chattanooga, Tennessee

Mr. Michael H. Camp  
Complex Manager  
General Motors Corporation, Ramos  
Laredo, Texas

Dr. Goodman B. Espy III ('57)  
President, OB-GYN Associates  
Marietta, Georgia

Dr. James E. Hill ('66)  
Division Chief, Building Environment Division  
National Institute of Standards & Technology  
Gaithersburg, Maryland

Mr. Robert G. Hill ('58)  
President, Wave Air Corporation  
Atlanta, Georgia

Dr. Artis Jenkins ('84)  
Technical Manager, Lucent Technologies  
Norcross, Georgia

Mr. John G. Johnson ('59)  
Vice President, Harris Corporation  
Quality & New Processes  
Melbourne, Florida
Mr. William S. Johnson ('49)
Rio Rancho, New Mexico

Mr. Robert J. Millikan ('59)
Vice President, Engineering & Tech.
Georgia-Pacific Corporation
Atlanta, Georgia

Mr. Parker H. Petit ('62)
Chairman & CEO, Healthdyne Inc.
Marietta, Georgia

Mr. Charles L. Ray ('50)
Marietta, Georgia

Dr. Dennis L. Riddle
Business Manager, Milliken & Company
LaGrange, Georgia

Mr. Oliver H. Sale, Jr. ('56)
FESCO International
Norcross, Georgia

Mr. Paul Schutt
Chief Executive Officer
Nuclear Fuel Services, Inc.
Roswell, Georgia

Dr. Nam P. Suh
Massachusetts Institute of Technology
Department of Mechanical Engineering
Cambridge, Massachusetts

Mr. Joseph K. Tannehill ('55)
Chairman & CEO
Merrick Industries, Inc.
Lynn Haven, Florida

Mr. William L. Thacker, Jr. ('67)
President & Chief Executive Officer
TEPPCO
ACKNOWLEDGMENT

Writer and Editor: Rona A. Ginsberg

Special thanks to: Mary Jo Kleine for preparing the manuscript; Craig Moonshower for designing the document; and Gary Meek, Stanley Leary, and Sue Clites for the photographs in this report. We also gratefully acknowledge the Woodruff Endowment to the Woodruff School of Mechanical Engineering, which provided the funds to produce this annual report.