

FACULTY/STAFF NEWSPAPER

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THE GEORGIA INSTITUTE OF TECHNOLOGY

Rehabilitation device may offer therapeutic alternative for stroke patients

David Terraso Institute Communications and Public Affairs

s the most common cause of adult disability in the United States, a stroke leaves many survivors unable to perform tasks that were once part of their daily routine. Most of the time the disabilities are treatable, but the high cost of rehabilitation therapy leaves many patients to cope on their own.

Now, a new device has the potential to reduce the cost of therapy while increasing access by performing many of the therapists' tasks robotically. Jay Alberts, assistant professor in the School of Applied Physiology, and colleagues from Emory University are beginning a two-year study to see if the Hand Mentor is a feasible complement to individual therapy. "The question we're trying to

answer is 'can we get the same level of improvement while cutting the time a patient spends with a therapist in half?'" said Alberts. "If we can, that could make treatment more accessible by making it more affordable for insurance companies to cover."

Stroke patient Herbert Brooks has difficulty controlling his right hand. A pre-trial participant, he slips his arm into the Mentor, resting his fingers on the hand grip. His therapist punches

Rehab continued, page 2



Ellen Frick works with patient Herbert Brooks during a pre-trial test of the Hand Mentor.

FACES helps keep Tech among top schools for minority Ph.D.s

12 percent of the national total

Matt Nagel Institute Communications

and Public Affairs

eorgia Tech continues to be a national leader in awarding minority doctoral degrees, according to the latest National Science Foundation Alliances for Graduate Education and the Professoriate statistics.

Though several critical programs play a role in attracting minorities to Tech for graduate degrees, Facilitating Academic Careers in Engineering and Science (FACES) is one of the programs responsible for helping minority students earn their doctorate. The program is an alliance between Tech, Emory University, Morehouse College and Spelman College.

The FACES alliance is designed to increase the number of African-American students receiving doctoral degrees in engineering and science fields as well as the number of these individuals entering the professoriate.

The 34 doctoral degrees awarded by FACES institutions during the 2003-2004 school year represented 12 percent of the national total. Georgia Tech had 33 graduates, 19 of which were African-American. One student graduated from Emory.

FACES Project Director Gary May said the program is unique "in that it addresses each critical step along the career path of a candidate. Also, African-American faculty members are fully involved in all aspects of the program."

The program consists of three elements: recruitment and student preparation, retention and mentoring, and future faculty development.

Undergraduate students are given opportunities to partner with faculty for research as part of the recruitment. Once in the program, students are given a fellowship to help with retention. May believes the last element may be one of the most crucial.

"It is a grant that we give the students to help with their first job. We don't attach any conditions to it," says May. "They can use it for research equipment or anything that will help them get started in an academic or research career."

Georgia Tech currently has about 60 fellows in the FACES program. Thirty-one have petitioned to graduate this year.

May also attributes the success of the program to the support it has received among faculty and the administration. The Institute's dedication to FACES starts at the top, where President Wayne Clough is the principal investigator.

"The Georgia Tech administration and faculty have done everything from advising students to putting on programs. I think Georgia Tech takes a lot of pride and satisfaction in these types of university efforts and I think that is crucial to the success that we've enjoyed," said May.

'Towers' of carbon nanotubes could provide more efficient solar power

John Toon Research News

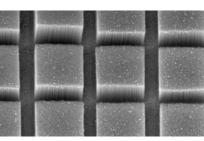
hen residents of New York's Manhattan Island ran out of real estate for new construction, they expanded vertically – using multi-story buildings to get more living space on their compact island.

Scientists at the Georgia Tech Research Institute (GTRI) hope to follow their example, but on a nanometer scale — building carbon nanotube towers atop photovoltaic (PV) cells to extract more power from the sun. The nanometer-scale towers, which would be coated by the special semiconductor junction materials used to generate electrical current, would increase the surface area available to produce electricity.

Reflections off the towers would provide more opportunity for each photon of sunlight to interact with the semiconductor junction of the cell. That would increase the power output from PV cells of a given size, or allow cells to be made smaller while producing the same amount of power. "You will typically get low voltages from the sun, but it generates a steady-state supply — like a fuel cell — but without the need for a consumable fuel," explained Jud Ready, a research engineer in GTRI's Electrooptics, Environment and Materials Laboratory who is the project's principal investigator. "It would certainly be viable for recharging and for supplying power to a base where people are stationed long-term. This could have significant benefits from a supply logistics standpoint."

The three-dimensional cells could be useful in space applications,

Towers continued, page 2



GTRI scientists have demonstrated an ability to precisely grow "towers" composed of carbon nanotubes atop silicon wafers. The work could be the basis for more efficient solar power. This image was taken at a 20 micron - or 20,000 nanometer - scale.

"QUOTE-UNQUOTE"

"This is an opportunity to go way beyond what we're doing now. It gives us a significant advantage in being able to attract faculty, students ... money and all that wonderful economic development stuff that is so very important." —Les Saunders, director of Capital Planning and Space Management, on the Nanotechnology Research Center, for which Gov. Sonny Perdue has proposed \$5 million in the current budget for design, demolition and site preparation. (Atlanta Business Chronicle)



WHISTLE

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Georgia Tech is a unit of the University System of Georgia.

Alumnus gift supports both academics and campus life

Dan Treadaway Institute Communications and Public Affairs

ost gifts from alumni to their alma mater tend to support either the academic side or the campus life side of the university. David Flanagan, has made a major gift to Georgia Tech that will enrich both immeasurably.

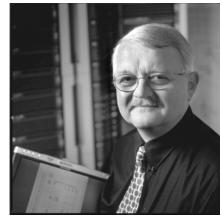
Flanagan's generous gift will both establish the David D. Flanagan/ Georgia Research Alliance (GRA) Eminent Scholar in Biological Systems as well as provide unprecedented support for the Outdoor Recreation Georgia Tech (ORGT) program, part of the Campus Recreation Center.

The new Biological Systems Chair is housed in the Department of Biomedical Engineering.

"Biological systems is truly at the forefront of research at the intersection of engineering with the life sciences," said Don Giddens, dean of the College of Engineering. "This new chair will have an extremely tremendous impact on this exciting area of research."

Professor Eberhard Voit has been appointed to the new Biological Systems Chair. His research has focused on the areas of biomedical systems metabolic pathways and biochemical systems theory. Applications of his research include developing drug treatments with minimal side effects, improved food production processes for the agriculture industry, and more cost-effective production of various substances of interest to industry such as alcohol, penicillin and dietary supplements.

"This gift underlines the importance of systems biology and Georgia Tech's strong commitment to it," said Voit. "Only a few years ago, systems biology was living in the shadow of molecular biology, because its



Biomedical Engineering Professor Eberhard Voit will assume the newly endowed chair in biological systems.

potential was not generally recognized. By dedicating a chair to this field, Mr. Flanagan and Georgia Tech are telling the world that systems biology is one of the really worthwhile enterprises of the twenty-first century. This will certainly be noticed by the scientific community and attract superb students."

ORGT gift breaks new ground In making the ORGT portion of his gift, Flanagan, who earned an industrial engineering degree in 1976, recalled the enjoyment of kayaking with fellow students as one of his most cherished Tech memories.

"We alumni talk a lot about how tough the academic experience at Tech was," said Flanagan, president of Elm Street Development in McLean, Va. "But for the majority of us, being involved in student organizations was just as important as the academics. My passion was ORGT, especially kayaking. Not only was the physical sensation of kayaking a fun and exciting challenge, but sharing that experience with other ORGT members also created fantastic memories that all of us will have for a lifetime. We really learned how to work as a team in ORGT."

To ensure that future generations of Tech students have the same opportunities he had, Flanagan has designated a substantial portion of his overall gift to ORGT in honor of Miller Templeton, retired director of the Office of International Education, who was and continues to be a consistent and passionate advocate for ORGT.

"I made it a point over the years to ask students who participated in ORGT events that I led about the value they felt the program had for them," Templeton recalled. "They would all say that after meeting the huge challenge of outdoor activities such as backpacking 150 miles through the backcountry of Yellowstone Park or the Grand Canyon or running the Colorado River rapids, they believed they could handle whatever challenges came their way in life. I think that's a pretty powerful endorsement."

That emotion is shared by Michael Edwards, director of the Campus Recreation Center, which administers ORGT.

"David Flanagan's expression of support for ORGT's mission and his belief in the program's value for Tech students is nothing short of incredible," said Edwards. "This unprecedented gift has the power to help ORGT grow and serve Tech students in ways that perhaps none of us has ever imagined before."

"My wife Ann and I are so pleased to be able to make this gift to Georgia Tech," said Flanagan. "We are especially grateful to Don Giddens and many others at Tech who helped us find a creative way to support two very different, but very important, aspects of the Georgia Tech experience."

Towers, cont'd from page 1

where power is in constant demand and launch weight is critical. Ultimately, they also could be used in developing nations where low-cost electrical power is vital to expanding economies.

The researchers have already developed techniques for precisely growing carbon nanotube bundles atop silicon wafers that have been treated with catalysts to produce geometries that resemble threedimensional nano-models of Manhattan.

The next step will be to work with collaborators at GTRI and the Schools of Materials Science and Engineering and Electrical and Computer Engineering to apply the special coatings, whose junction produces current.

Rehab, cont'd from page 1

a few buttons on the device's computer. The Mentor's air muscles contract, extending his wrist to a programmed angle.

The rest is up to Brooks. The machine stops pulling, and the therapist asks Brooks to extend his wrist the rest of the way. All the while, the Mentor is measuring how far he extends, how much force he is using and how much electrical activity his muscles are experiencing. It also records the resistance he gives as the machine pulls his hand into position. If he's improving, the resistance should decrease.

Developed by Kinetic Muscles Inc. in Tempe, Ariz., the Hand Mentor is used with a type of therapy known as repetitive task practice. Typically, patients who have difficulty controlling a part of their body after a stroke learn to compensate with another limb. This acquired behavior, known as learned non-use, can prevent patients from improving the functioning of the affected limb. Repetitive task practice works by forcing patients to use the impaired limb.

"Active therapy may help the brain rewire itself to use different neurons for muscle movements that were impaired by stroke," explained Alberts. "In essence, we're training the brain as well as the muscles."

Alberts is collaborating with Steve Wolf and Andrew Butler in Emory's Department of Rehabilitation Medicine on the NIH-funded preliminary clinical trial. The 24 participants will spend three weeks undergoing traditional repetitive task training, using just the Mentor, or both. Patients will undergo brain scans before and after the therapy regimen.

Symposium looks at the 'monstrous' in the arts

Michael Hagearty Institute Communications and Public Affairs

A s an assistant professor in the School of Literature, Communication and Culture (LCC), Lisa Yaszek's specialty is science fiction. This week, she has planned multiple events and symposia that involve vampires, cyborgs and cyberpunks, introducing art and film exhibits as well as presentations from local scholars, science fiction writers and artists from Cartoon Network's "Adult Swim."

"We specifically chose the theme of 'Monstrous Bodies in Science, Fiction and Culture' because it allowed us to demonstrate how the research we do in LCC connects with Georgia Tech's dedication to scientific and technological development," she said. "We tend to think about bodies as autonomous, self-contained entities. However, new sciences and technologies both challenge and transform our experiences with all kinds of bodies on a daily basis. As humanities scholars, LCC faculty and students are interested in demonstrating how artists think about and represent the kinds of scientific and technological issues that our colleagues elsewhere at Georgia Tech grapple with on a daily basis."

Yaszek also oversees a research lab centered around the Bud Foote Science Fiction Collection, named for the emeritus professor who donated his personal science fiction collection — some 8,000 items — to the Institute following his retirement in 1999.

"The mission of the Science Fiction Lab is twofold," she said. "First, the Lab provides students with an opportunity to conduct independent research in one of Tech's most unique resources. Second, students who work in the Lab aim to heighten public awareness about the Collection by publishing their research results online after a rigorous process of peer review and revision. We hope that this research portal will demonstrate Georgia Tech's ongoing commitment to science fiction studies, and that it will be a useful resource for everyone interested in learning more about science fiction."

Foote's death earlier this month, she said, will most certainly cast a shadow over some of the events, but his spirit will remain forever present in the legacy he left behind.

"I'm particularly saddened by this because we originally conceived of the 'Monstrous Bodies' symposium as a way to showcase the kind of scholarly work Bud began twenty-five years ago when he established the first science fiction class at Georgia Tech. This was one of the first accredited college-level courses on science fiction, and in many ways it was the cornerstone of my department's ongoing commitment to the study of the fantastic in the arts. I'm sorry Bud won't be there in body to witness the fruit of all his labors, but we are determined to make this symposium a real celebration of his life nonetheless."

For more information...

Monstrous Bodies in Science, Fiction and Culture www.monstrousbodies.lcc.gatech.edu

Bud Foote Science Fiction Collection www.sf.lcc.gatech.edu Science Fiction Lab

sciencefictionlab.lcc.gatech.edu

Bud Foote, professor emeritus of literature, dies

Michael Hagearty Institute Communications and Public Affairs



I rving Flint "Bud" Foote, an emeritus professor of literature who helped push science fiction into the realm of academic research and debate, died of complications from a stroke earlier this month. He was 74. As literature, Foote

said he was drawn to science fiction for the way it spoke to the concerns of its time.

"Science fiction deals with our mixed feelings about the high rate of change which has occurred for the last 200 years," he said during a 1994 interview for the Georgia Tech Alumni Magazine. "We fear our technology because we can see the dangers in it. But we have great hopes for our technology. It's that dynamic of contradiction that drives the machine."

A native of Laconia, N.H., Foote graduated summa cum laude from Princeton University in 1952 and earned his master's degree from the University of Connecticut. He began teaching science fiction to Tech students in 1971, and spent nearly three decades pioneering university-level courses in the genre.

It was, he said, a natural extension of his personality. "One of the things I enjoy most in life is reading books and talking about them," Foote said in 1994. "So I got a job where I read books and talk about them, and they give me money — which seems a little immoral."

Foote, who retired in 1999 after a 31-year career at Tech, donated 8,000 volumes of science fiction to the Library and Information Center. Housed in the Library Archives, the Bud Foote Science Fiction Collection includes many first editions and some of the best-known books by some of the most acclaimed writers over the past two centuries.

"Like everyone I know who ever crossed his path, I found Bud to be an amazing person," said Literature, Communication and Culture Assistant Professor Lisa Yaszek. "(He was) a very passionate scholar and artist."

Professor Foote's reading list for his "Survey of Science Fiction" course

- "Frankenstein," by Mary Shelley
- "20,000 Leagues Under the Sea," by Jules Verne
- "A Connecticut Yankee in King Arthur's Court," by Mark Twain
- "The War of the Worlds," and "The Time Machine," by H.G. Wells
- "We," by Yevgeny Zamyatin
- "Gateway," by Frederik Pohl
- "The Left Hand of Darkness," by Ursula Le Guin
- "Red Mars," by Kim Stanley Robinson
- "The Difference Engine," by William Gibson and Bruce Sterling

IN BRIEF:

A Web site for lost passwords Earlier this month, the Office of Information Technology (OIT) launched a new, expanded password Web site. The new site offers several new features that make it easier for users to manage their GT Account and GT Active Directory passwords.

GT Accounts are used to access Spectrum e-mail, BuzzPort, TechWorks, the LAWN, OIT Software Distribution and other OIT-supported computing resources. GT Active Directory is a Windows account management service that is used by a number of departments and campus computing labs.

Along with changing account passwords, the new GT Account Password Change and Account Management Web site allows users to view password information, including the last date a password was changed and the date it's due to expire.

Another feature on the site is the ability to reset passwords. To be able to use this feature, users log in to the new password Web site and create three password hints. Then if a password is forgotten or expired, it can be reset without contacting IT support.

The Web site is **www.password.gatech.edu**. For more information, contact the OIT Support Center at 894-7173 or e-mail support@oit.gatech.edu.

Women's tennis #6 in the nation

Georgia Tech's women's tennis team climbed to No. 6 in the polls released last week by the Intercollegiate Tennis Association (ITA), marking the highest ranking ever for any Georgia Tech tennis team in history.

The Yellow Jackets also become just the second women's team in Georgia Tech history to crack the top 10. The volleyball team climbed as high as No. 4 in the rankings a season ago.

The Yellow Jackets have already recorded victories over one top-10 team (University of Georgia) and three more top-25 teams (Clemson University, Baylor University and the University of Alabama) this season, and still have home matches to play against No. 11 Miami (Apr. 10), No. 7 Duke (Apr. 16) and No. 10 UNC (Apr. 17).

The team's record is 11-2 for the season, including a 4-0 mark in ACC play. Under current head coach Bryan Shelton, the Yellow Jackets are 77-50 and own a 22-20 record in conference matches.

Pi Mile Road Race

Online registration has begun for the 33rd Pi Mile Road Race to be held Saturday, Apr. 16 on the Georgia Tech campus.

The 5K route, which was trimmed from the traditional 3.14-mile length in 2002, will wind through campus and will be followed by a post-race celebration on the Tech Tower lawn with food, drinks and an awards ceremony.

Registration begins at 7 a.m., with the race starting at 8 a.m. Race T-shirts will be distributed to the first 500 registrants.

Awards will be presented to the top male finisher, top female finisher, top male and female student finishers, top male and female faculty/staff finishers, top alumnus and alumna and the top three male and female finishers in age categories from under 14 to over 60.

For information and to register online, visit **www.gtalumni.org/pimile**.

CAMPUSEVENTS

Arts & Culture

Apr. 1

The Ferst Center for the Arts welcomes South African jazz guitarist Jonathan Butler for an 8 p.m. performance. For tickets, call 894-9600.

Apr. 7

The Poetry at Tech series continues with poets Robert Bly and Heather McHugh, at 7 p.m. in the College of Management's LeCraw Auditorium.

Apr. 9

The American Museum of Papermaking hosts "Paper from Plants: A Handmade Paper Workshop," from noon to 3 p.m. at the Institute of Paper Science and Technology. For more information, visit **www.ipst.gatech.edu/amp**.

Brown Bags/Conferences/Lectures

Mar. 29

The Library and Information Center's Tuesday Talks Lecture features College of Computing Associate Professor Irfan Essa, on "Aware Home: Sensing, Interpretation and Recognition of Everyday Activities," at 2:30 p.m. in the Wilby Room. Students, faculty and staff are welcome.

Mar. 30

The School of Biology welcomes Nicole Lopanik, a research fellow at the University of Michigan, on "Marine Natural Products: Integrating Chemical Ecology and Biotechnology," at 3 p.m. in IBB's Suddath Seminar Room.

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Mar. 30

The School of Psychology's spring colloquium series welcomes Nancy Cooke, professor of applied psychology at Arizona State University, on "Emergent Team Cognition (or What Was Wrong with the U.S. Olympic Basketball Team?)" at 3 p.m. in the J.S. Coon Building.

Mar. 30

The College of Management's IMPACT Speaker Series welcomes Gary Betty, president and CEO of Earthlink, at 4:30 p.m. in the LeCraw Auditorium.

Mar. 30

The Architecture Program's lecture series features Harrison Design Associates Visiting Scholar Gregory Saldana, at 5 p.m. in the College of Architecture Auditorium.

Mar. 31

The School of Mechanical Engineering's Woodruff Colloquia Series welcomes UCLA Professor Vijay Dhir on "Nucleate Boiling in Reduced Gravity: Numerical Simulations and Experiments," at 11 a.m. in the MaRC Auditorium.

Mar. 31

President Wayne Clough will give the keynote presentation during Emory University's two-day symposium "Water in Our Lives," at 6:30 p.m. in Emory's Cox Hall Ballroom. The symposium is free and open to the public. For more information, visit **www.emory.edu/water**.

Apr. 5

The School of Mechanical Engineering's Woodruff Colloquia Series features David Auslander, professor of Mechanical Engineering and associate dean of Student Affairs at the University of California at Berkeley, on "Objective-Oriented Mechanics: A Prototype for Mechanical Engineering Curricular," at 11 a.m. in the MaRC Auditorium.

Apr. 7

The School of Electrical and Computer Engineering's annual James R. Carreker Distinguished Lecture welcomes Howard Lance, chairman, president and CEO of Harris Corporation, on "Advanced Communications and Information Technology-Integrated Solutions for Prosperous and Perilous Times," at 3:30 p.m. in the Van Leer Auditorium.

Miscellaneous

Apr. 8

The deadline for students to apply for the President's Undergraduate Research Award (PURA). Applications are available online. For more information, visit **www.undergradresearch. gatech.edu/institute-wide.htm**

Ongoing

Techmasters — Tech's chapter of Toastmasters International for faculty, staff, students, alumni and spouses — meets every Thursday at 7:30 a.m. in room 102, Microelectronics Research Center. For more information, visit **www.techmasters.gatech.edu**.

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Appliances

Brand new white refrigerator, model number TBX18S1BRLWW, serial number S2582842. Came with house, \$175 OBO. Call Annette, 678-467-6732.

Roper washing machine, excellent condition. \$125 OBO. Call 894-5633.

Automobiles

1993 GMC Suburban. Teal, cloth interior, good condition, 110K miles, \$4,500 OBO. Call 404-248-9739 evenings or e-mail

ken.cunefare@me.gatech.edu.

1995 Mazda MX-6. White with tan interior, 158K miles, 5-speed. Never had problems with engine at all, runs well. \$1,000 OBO. Call 894-4875.

1999 Dodge Dakota RT regular cab. Belltech suspension, tonneau bed cover. Fully loaded, Infinity stereo system, CD, cassette, amethyst color, 91,450 miles. Asking \$14,500. Call 678-432-8199, after 5 p.m.

2001 Toyota Sienna LE minivan. Champagne, seven-passenger, captain's chairs, tape/CD player, dual climate, remote entry, 71K miles. \$12,500. Extended warranty through Sept. 2005. Call 770-365-6445 or e-mail hope4u2@bellsouth.net. 2002 Chevrolet S-10 extended cab. One owner. White with dark gray interior, ABS, V6 4300 Vortec, sport suspension, tinted windows, tow package, Rhino bed liner, 15K miles, \$11,500. Call 770-241-3151.

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FURNITURE

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Light blue padded rocker with padded rocker ottoman with light oak wood frame. Paid \$150, sell for \$40. E-mail jeanette.collins@gtri.gatech.edu or call 894-9245.

Wood queen-size bed with wood frame. Matching dresser w/mirror, chest of drawers and 2 night stands. \$800 OBO. E-mail glenn.moscoso@coa.gatech.edu.

Queen Anne buffet and hutch with matching extension table and 6 chairs. Cherry finish. \$300. E-mail chris.hamlin@oit.gatech.edu for pictures.

Real Estate/Roommates

Approx. one-acre lot at Lake Jackson in Turtle Cove (Eagle Lot 10). Direct common property access to the lake, underground utilities. 2005 taxes and fees paid. \$15,500. E-mail dennis.kelly@edi.gatech.edu or call 478-825-5504. 2BR/1.5 BA brick townhouse. Complete renovation in 2000, including new appliances. 2 blocks to Smyrna Village Green, 30 minutes to GT. Asking \$132,000. E-mail eileengram@juno.com or call 894-0065.

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1BR/1BA condo at Peachtree St. and North Ave. Large balcony, hardwoods, floor-to-ceiling windows. Gym, pool, billiards, parking, 24-hour concierge. \$139,900 Call Randy at 404-271-1378 or e-mail randybrazee@kw.com.

1BR/1BA condo in Midtown. Located on Ponce de Leon Avenue. Perfect for those who love an older, more classic architectural style, but still want modern amenities and a central location. \$950/month OBO. Call 404-663-6291.

Rent or rent-to-own 3BR/2.5 BA home in Stone Mountain. Great master suite, cul-de-sac, close to shopping, schools, medical. \$1,200/month. Call 404-432-3122.

3BR/2BA ranch home in Snellville: Shiloh school district, sunroom, 2-car garage, huge front & fenced back yard, new appliances. \$975/month. Call 404-432-3122.

Vacation rental in Grayton Beach, Florida. 3BR/2BA with 2 porches available weekly or nightly. On Gulf Coast between Panama City and Destin. E-mail hdgentry@mindspring.com or call 404-636-3146.

D

S

2BR/1BA home in Grant Park. On MARTA line. Nine-foot ceilings, hdwd. floors, gas heat, central air, washer/dryer, fenced yard. Pets OK. \$950/month. Call 770-480-4457.

SPORTS/FITNESS/RECREATION

1996 Yamaha Waverunner III, excellent condition, low hours, garage kept. with trailer, \$2,400. Call 770-975-3794 or e-mail kathy.cheek@ece.gatech.edu for pics.

MISCELLANEOUS

XM SkyFi receiver, car kit and boom box. Cost new \$220 + tax, sell for \$95. Call 894-8728 or e-mail gary.phillips@facilities.gatech.edu.

Graduate or Ph.D. married international couple with no children or pets wanted to house/dog sit in Buckhead home, 10 minutes from campus. Daily rate. References required. Call 404-355-2930.

To submit an ad, e-mail the text to editor@icpa.gatech.edu.