Georgia Tech's Faculty/Staff Newspaper • Vol. 34, No 10 • MARCH 9, 2009

THE Whistle

PEOPLE

Student group helps create Georgia Tech's Google

Ajai Karthikeyan has launched the "Young Entrepreneurs Society" to help students transform ideas into businesses.
(Atlanta Business Chronicle)

http://tinyurl.com/cs3v5j

RESEARCH

The Science of Bracketology

The computerized ranking system of three Georgia Tech professors could keep you from taking a bath in your annual March Madness office pool. (Contingencies)

http://tinyurl.com/cgxzos

NEWS

CMOS chip built for 60 GHz wireless data transmission

Engineers at Georgia Institute of Technology have built a CMOS chip that transmits 60-GHz digital signals over relatively short ranges. (Machine Design)

http://tinyurl.com/89deac

Top 10 list

Tech research labeled pioneer of important technologies

ROBERT NESMITH
COMMUNICATIONS & MARKETING

The January issue of New Scientist played the prognosticator, naming the 10 technologies that, in 30 years, will be as important and ubiquitous as the cell phone—which in turn was created 30 years ago. Research in the development of two items on the magazine's list was pioneered at Georgia Tech.

Materials Science and Engineering Regents' Professor Zhong Lin Wang displays flexible charge pumps that are able to produce alternating current through the stretching and relaxing of zinc oxide wires.

Nos. 4 and 5 on the list—"Spider vs Gecko" and "You Power," respectively—have at their roots research conducted at Georgia Tech. On both, Materials Science and Engineering Regents' Professor Zhong Lin Wang played a significant role.

"Spider vs Gecko" chronicles the search for an adhesive consisting of nanoscale "hairs" that could support a large amount of weight. In searching for the best structure and framework for such a design, researchers from the University of Dayton, Tech, the Air Force Research Laboratory and the University of Akron designed an improved material that is 10 times stronger than a real gecko's foot at resisting perpendicular shear forces.

"The model for that was used in the growing of carbon nanotubes, which grow like grass," Wang said. "When short, it grows everywhere. When tall … they achieve very good alignment." The key to the design, Wang says, is the fiber's contact with the substrate. In 2008 his research led to the use of multi-walled carbon nanotubes with "curly, entangled tops," which mimics the looped, padded feet of a gecko's foot.

The future impact of this technology, Wang says, is not for a window walker or a spandex-clothed crime fighter, but for adhesion on the nanoscale, where welding and soldering would be ineffective, and for use in the vacuum of space, where a dry adhesive would be necessary. Wang worked with Dayton Professor Liming Dia on the research, sponsored by the National Science Foundation and the U.S. Air Force Research Laboratory at Wright-Patterson Air Force Base near Dayton, Ohio.

His major research at Tech has focused on "You Power"—No. 5 on the magazine's

TOP 10, continued on page 3

EVENTS

ARTS & CULTURE

March 13
The Ferst Center for the Arts welcomes The Art of Bellydance, presented by the Bellydance Superstars, starting at 8 p.m. Tickets for students, faculty and staff are $20 and $27.
www.ferstcenter.gatech.edu

March 15
The Army Ground Forces Concert Band presents "Sousa, Stars and Stripes Forever!" starting at 3 p.m. at the Ferst Center for the Arts.
www.ferstcenter.gatech.edu

March 29
Portuguese artist Mariza performs fado music, blues music that originated 200 years ago in Lisbon, at 5 p.m. in the Ferst Center for the Arts. Tickets are $26 and $36, or $20.80 or $28.80 with subscription.
www.ferstcenter.gatech.edu

March 31
Off-Broadway romantic comedy "Platanos & Collard Greens" will be at the Ferst Center for the Arts, starting at 7:30 p.m. The play is sponsored by the Student Advisory Council to the Office of Minority Education Development.
www.ferstcenter.gatech.edu

April 3
"Jekyll and Hyde" begins at DramaTech Theater, starting at 8 p.m.

Calendar continues on page 2

Musical chairs

Guthman Competition winners announced

Georgia Tech's Center for Music Technology (GTCMT) announced Jaime Oliver's Silent Drum won first place in first Guthman Musical Instrument Competition. The competition—supported by the philanthropic family of Tech alum Richard Guthman—showcased new uses of technology to enhance participation in music performance and music creation.

Photography by the College of Architecture

Guthman Musical Instrument Competition winner Jaime Oliver shows the Silent Drum to Richard and Margaret Guthman.

Nearly 30 inventors from seven countries performed on Georgia Tech's campus in the competition for more than $15,000 in prizes. Guest judges Eran Egozy, co-founder and chief technical officer of video game development company Harmonix Music Systems, and digital music writer Eliot Van Buskirk joined the center to score the instruments for their musicality, design and engineering.

Eric Singer from the League of Electronic Musical Urban Robots (LEMUR) won second place for his robotic guitar, and SLABS Touch Pads by David

GUTHMAN, continued on page 4

Faculty/Staff Honors

The Faculty/Staff Honors Luncheon will be held April 15, from noon to 2 p.m. in the Student Center Ballroom. All employees honored at the luncheon will receive personal invitations via campus mail. For others wishing to attend, please RSVP by March 27 at www.events.gatech.edu.

EVENTS

Tickets are $8 for faculty and staff. The show runs through April 18.
www.dramatech.org

CONFERENCES/ LECTURES

March 10

School of Mechanical Engineering Assistant Professor Todd Sulchek presents "Using Microcantilevers to Count Biological Bonds," from noon to 1 p.m. in room 102 of the Microelectronics Research Center.
www.mirc.gatech.edu

March 11

The IMPACT Speaker Series welcomes John Prendergast, human rights activist and co-chair of the ENOUGH Project, in collaboration with Dialogue...start one!, starting at 4:30 p.m. in the LeCraw Auditorium of the College of Management.
www.ile.gatech.edu/impact.html

The Georgia Tech Honors Program and College of Sciences Karlovitz Lecture Series host Joe Palca, science correspondent for National Public Radio, as he presents "How to Explain the Universe in Two Minutes or Less," at 7 p.m. in the LeCraw Auditorium in the College of Management.
www.honorsprogram.gatech.edu

March 12

Helene D. Gayle, CEO and president of international aid organization CARE, is scheduled to receive the The Ivan Allen Jr. Prize at the Ivan Allen College's annual IAC Founder's Day Luncheon, starting at 1 p.m. in the Georgian Ballroom at the Biltmore.
www.iac.gatech.edu

March 24

Oxford University Professor Sir Roger Penrose presents the Center for Relativistic Astrophysics Distinguished Lecture, "Aeons Before the Big Bang?," from 5:30 to 6:30 p.m. in the LeCraw Auditorium of the College of Management.
www.cra.gatech.edu

The Center for the study of Women, Science and Technology holds a focused research panel on "International Dimensions of Women and Higher Education," from noon to 1:30 p.m. in President's Suite C of the Student Success Center. RSVP to **wst.lrn.c@gmail.com**.
www.wst.gatech.edu

March 25

Ralph Cleveland, senior vice president of Engineering and Operations at AGL Resources, will be the IMPACT Speaker, starting at 4:30 p.m. in the LeCraw Auditorium in the College of Management.
www.ile.gatech.edu

March 26

College of Architecture Assistant Professor Claudia Windgarden presents her work on "Design and Technologies for Communications," from noon to 1 p.m., in the Architecture Library, as part of the COA Research Forum.
www.coa.gatech.edu

Calendar continues on page 3

Research

Aviation safety

New instrument could aid airports in detecting hidden hazards

ABBY VOGEL
RESEARCH NEWS

While radar and other existing systems typically warn aircraft pilots of potential weather hazards during flight, they do not detect all possible atmospheric dangers.

"Some hazards can be the most dangerous because pilots' eyes and radar cannot see them," said Gary Gimmestad, a principal research scientist in the Georgia Tech Research Institute (GTRI). "For instance, if a plane encounters turbulence or low visibility that does not include rain droplets, radar will not sense them."

GTRI is leading a team of researchers from five universities and research organizations to investigate the feasibility of using a forward-looking interferometer to detect several of these invisible hazards during takeoff, cruise and landing. Project team members include researchers at Hampton University, the National Aeronautics and Space Administration's Langley Research Center, the University Center for Atmospheric Research, the Air Force Institute of Technology and the University of Wisconsin-Madison.

A new approach for detecting invisible aircraft hazards utilzing forward-looking interferometers could improve safety.

Forward looking interferometers were originally developed for satellite remote sensing. They can detect the presence of environmental hazards by identifying each hazard's distinct infrared spectral signature. The instruments have been used to detect aerosols and gases in the air, but not from aircraft during flight.

This article was featured in the Fall 2008 Research Horizons magazine.

With funding from NASA, the researchers are conducting studies to determine the sensitivity of the system for detecting clear-air turbulence, wake vortices, volcanic ash, low visibility, dry wind shear and icing. They are also developing algorithms to estimate the severity of the hazards.

A major concern for air navigation is clear-air turbulence because it cannot be seen and is therefore difficult for pilots to avoid.

At airliner cruising altitude, clear-air turbulence is frequently encountered around jet streams or near mountain ranges. For this reason, the researchers conducted their first ground-based field test in Boulder, Colo., because they expected turbulence to be generated over the Rocky Mountains.

During the Boulder ground test in January 2008, the research team evaluated the feasibility of the infrared interferometer to detect clear-air turbulence at a useful distance from the sensor by measuring temperature fluctuations. They also evaluated the turbulence detection and hazard prediction algorithms they developed.

"The measured results corresponded well to the model predictions, and this result was interpreted as a successful detection of mountain waves with interferometric radiometry, which has never before been accomplished," said Leanne West, project director and GTRI senior research scientist.

Study shows older adults regulate negative feelings better

ABBY VOGEL
RESEARCH NEWS

With age comes the ability to better regulate emotions to avoid disrupting performance on memory-intensive tasks, according to a study published in the March issue of the journal Psychology and Aging.

The research study found that regulating emotions—such as reducing negative emotions or inhibiting unwanted thoughts—is a resource-demanding process that disrupts the ability of young adults to simultaneously or subsequently perform tasks.

"This study is among the first to demonstrate that the costs of emotion regulation vary across age groups," said School of Psychology Chair Fredda Blanchard-Fields, the study's lead author.

The study included 72 young adults who were 20 to 30 years old and 72 adults who were 60 to 75 years old. Funded by the National Institutes of Health (NIH), it was conducted by Blanchard-Fields and Susanne Scheibe, a former postdoctoral fellow at Tech, currently at Stanford University.

For the investigation, three-fourths of the participants watched a two-minute Fear Factor television clip depicting a woman eating something revolting in order to win money. The video was intended to induce a feeling of disgust in the participants. The remaining participants comprising the control group watched a two-minute clip of two men talking about a woman's dress and subsequently sharing a beer in silence that was not intended to induce emotions.

After watching one of the videos, each participant played a computer memory game. For the task, a number—between zero and nine—appeared on a computer screen and each participant had to determine whether that number matched the number that appeared on the screen two numbers earlier. Twenty-two trials were presented before the task concluded and a combined performance score was computed.

"To compare the effect that a person's emotion regulation strategies had on his or her performance at the working memory task, the participants who watched the disgust-inducing film were divided into three groups and given different emotion-regulatory instructions," explained Blanchard-Fields.

The study showed that all of the participants performed better at the working memory task after watching the clip than before, likely due to the learning process. However, after being told to turn their disgust into positive feelings, the young adults performed significantly worse than the older adults in the memory task. Older adults who were given the same instructions continued to improve at the memory task.

Photograph by Gary Meek

Georgia Tech's School of Psychology Chair Fredda Blanchard-Fields (left) and research assistant Daniel Pierce (center) ask study participant Mary Buchanan to fill out a questionnaire before beginning the trial.

"Older adults are so efficient at dealing with their emotions that it doesn't cost them any decrease in performance, which is a really positive thing," noted Blanchard-Fields.

For more information

www.psychology.gatech.edu

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Archived issues of The Whistle can be accessed electronically through the Georgia Tech Web page, or directly at **www.whistle.gatech.edu**.

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Institute

Global action

Conference helped to network, coordinate international humanitarian relief agencies

More than 180 participants converged on the Georgia Tech Conference Center on Feb. 19 and 20, all with the common goal of enhancing humanitarian logistics.

Stewart School of Industrial and Systems Engineering Professors Ozlem Ergun, Pinar Keskinocak, and Julie Swann organized the 2009 Humanitarian Logistics Conference that addressed pressing challenges in humanitarian relief and development, and inspired new ideas and practices.

Participants came from across the globe representing a variety of organizations interested in disaster relief including academia, the United Nations, government, private organizations and military. The conference opened dialog among the various humanitarian efforts and contributed to new collaborations and synergies across many different organizations represented by the attendees.

The conference consisted of several keynote and panel speakers on disaster preparedness and response, long-term development and humanitarian aid, and intra- and inter-organizational collaboration in disaster planning and long-term humanitarian aid.

For more information

www.scl.gatech.edu/research/humanitarian

LEFT: Plenary speaker Amer Daoudi, director of the World Food Programme's Logistics Division, spoke on world hunger and the challenges that come with reaching beneficiaries in remote and war-torn areas. ABOVE: Bert Thornton, vice president of Waffle House, discusses the restaurant's hurricane response protocol. In 2005, Waffle House was named one of the top four companies in the disaster response area for their decades of service to customers after hurricanes and other crises. TOP: The conference also hosted 37 poster presentations encouraging a continuation of dialog on ways that humanitarian organizations can continue to complement each other.

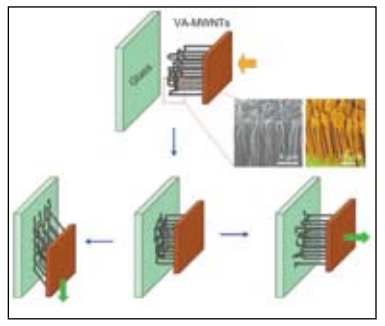
Boe speaks to campus

NASA astronaut aant Tech alumnus Eric A. Boe spoke at the Student Center Theater Feb 23. Boe was among the seven astronauts–and three Georgia Tech alumni–on the space shuttle crew for Endeavor's STS-126 mission in November. The pilot for the 16-day mission, Boe earned a master of science degree in electrical engineering in 1997. Gary May (left), Chair of the School of Electrical & Computer Engineering (ECE), and Don Giddens (right), Dean of the College of Engineering (CoE), are pictured with Boe.
www.coe.gatech.edu

TOP 10, continued from page 1

top 10 list—in which wearable fabric is constructed of zinc-oxide nanowires grown on Kevlar strands. When the material bends or compresses, a miniscule current is generated through the wires. While only producing a very small amount of current now,

Wang noted that technology is reaching major limitations, in that while everything is getting smaller, the technology standards and memory capacity are increasing. "When everything else is so small, the battery or power source needs to be small as well," he said. "However, usually as something decreases in size, its power consumption decreases as well."



Schematic shows the change in vertically-aligned multi-walled carbon nanotubes during adhesion measurements.

"Our body is the best energy source," Wang said. "[The question is] how do we convert this to external energy. [Tech is] the pioneer in this field. We are exploring how to convert body movement into electric energy." Wang says some of the applications for this wearable technology include providing power for cell phones.

Wang, the director of the Center for Nanostructure Characterization (CNC), has been on the faculty at Tech since 1995. Other research has cited his body of publications more than 26,000 times.

For more information

www.mse.gatech.edu

EVENTS

March 31

University of Colorado at Boulder Professor Niels Damrauer presents "Elements of Photochemical Control through Manipulation of Structure and Phase-shaping of Laser Fields," starting at 3 p.m. in room G011 of the Molecular Science and Engineering Building.
www.chemistry.gatech.edu

FACULTY/STAFF DEVELOPMENT

March 11

The Office of Organizational Development presents a brown bag seminar on "Performance Management Essentials—The Power of Goal Setting," from 1 to 2:30 p.m. in the Crescent Room of the Student Center Commons.
www.orgdev.gatech.edu

March 16

The Office of Organizational Development presents a brown bag seminar on "Performance Management Essentials—Career Planning and Professional Development," from 1 to 2:30 p.m. in the Crescent Room of the Student Center Commons.
www.orgdev.gatech.edu

March 16–April 23

The Language Institute is offering evening "English as a Second Language" classes, geared toward professionals at the intermediate or advanced level of proficiency. Classes are from 6 to 8 p.m.
www.esl.gatech.edu

March 18

Faculty, staff and students are invited to participate in diversity training utilizing the National Coalition Building Institute Model, from 8:30 a.m. to 4:30 p.m. in room 319 of the Student Center. E-mail Associate Dean of Student Affairs Stephanie Ray at sray@gatech.edu for more information.
www.ncbi.org

March 25

The Office of Organizational Development presents a training course on MS Office 2007 New Features, from 8:30 a.m. to 4 p.m., in room 203 of the Savant Building. Cost is $150.
www.trainsweb.gatech.edu

Ongoing

Training Services offers a Web-based tutorial on using a state purchasing card.
www.training.gatech.edu

MISCELLANEOUS

March 10

The Georgia Tech softball team plays a double-header against the University of Tennessee-Martin, the first home game in the new softball stadium, from 3 to 7 p.m.
www.ramblinwreck.com

March 13

Faculty, staff and students must submit their designs to the Earth Day T-shirt Design Contest by midnight, March 13. The winner receives a $500 prize.
www.earthday.gatech.edu

March 20

The Earth Day Committee is accepting nominees for the Environmental Leadership Award. Students, faculty, staff, alumni and retirees who have made a contribution to Institute sustainability are all eligible.
www.earthday.gatech.edu

For a more comprehensive listing of events updated daily, visit www.gatech.edu/calendar.

GUTHMAN, continued from page 1

Wessel, faculty co-director of the Center of New Music and Audio Technologies at the University of California, Berkeley, took third place.

"We were blown away by the diversity and quality of the competitors—it was great to see ideas from both commercial firms and academicians and just creative young musicians," said Tech music director Frank Clark. "Thanks to the Guthmans, we think the Musical Instrument Competition will expose new paradigms of expression year after year."

"It was a very open and competitive group of people with some very high quality instruments," said Oliver, a doctoral student at University of California, San Diego. "Judging was good and diverse, and technical support was great."

Oliver's instrument is a drum shell with an elastic spandex head, illuminated from the inside, that uses shapes and shadows to compute and emit sound. Other entries included Sorisu, which responded and accompanies a player's movements in the game Soduko; the Tongue Music System; and a whimsical star-and-circle-shaped contraption with exposed wires that uttered slow, mysterious sounds.

"Since this was the first competition of its kind, it brought together people that had been working on the subject for decades," said Oliver. "Good competitions have a feedback effect and I wouldn't be surprised to see this one having an effect in the number and quality of instruments that are developed in the following years."

"Anyone that has an idea should come, get some feedback and perhaps win," said Oliver. "Many of us do this trying to find ways of realizing sound morphologies that contain the nuance of human performance, unsatisfied with complex automations, in need of performing, of feeling that materiality that sometimes electronic sounds lack."

For more information

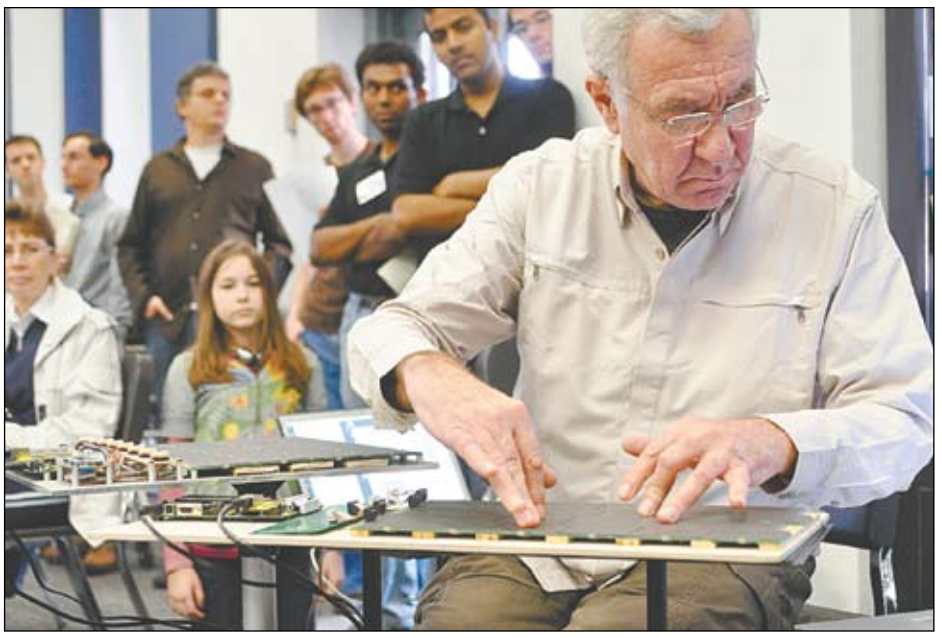
gtcmt.coa.gatech.edu

www.realidadvisual.org/jaimeoliver

www.lemurbots.org

cnmat.berkeley.edu

Musician Eric Singer won second place with the robot guitar, and David Wessel won third for SLABS Touch Pads.



Tech gets organized with 'Oprah'

Photograph by The Oprah Winfrey Show

Tech students received a room makeover courtesy of "The Oprah Winfrey Show." ABOVE: Phi Delta Theta fraternity brothers Joe Madden, Kevin Smith and Jack Nuttmann work with organization expert Peter Walsh. LEFT: A dorm room in Hefner Residence Hall belonging to Ashely Bush and Kali Watson was selected for the messy dorm room makeover. The results will be aired March 12 at 4 p.m. on WSB-TV/Channel 2.

In Brief . . .

Library dean featured on CBS News

Dean and Director of Libraries Catherine Murray-Rust will be spotlighted on the CBS Evening News on March 5.

The segment focused on the importance of colon cancer screenings. Murray-Rust will share her personal experience with a delayed diagnosis due to the difference in her insurance coverage when moving from Colorado to Georgia. Colorectal Awareness Month launched March 6.

www.cbsnews.com/video/watch/?id=4847279n

Bayor recognized by CELJ

Ronald Bayor, Chair of the School of History, Technology, and Society, has been recognized by the international Council of Editors of Learned Journals (CELJ) as the 2008 Distinguished Editor.

Bayor was the founding editor of the Journal, which is the official publication of the Immigration and Ethnic History Society. He focused the Journal on the process of migration, adjustment and assimilation, group relations, mobility, politics, culture, group identity, and other topics that illuminate the North American immigrant and ethnic/racial experience. 2008 marked Bayor's 24th year and final year as editor.

Agrawal earns outstanding award

Chemical and Biomolecular Engineering Associate Professor for Undergraduate Studies Pradeep Agrawal has been selected to receive the 2009 Georgia Tech Outstanding Undergraduate Academic Advisor Award.

He will receive the award at the Annual Faculty/Staff Honors Luncheon at noon on April 15 in the Student Center Ballroom from noon to 1:30 p.m.

CLASSIFIEDS

AUTOMOBILES/ MOTORCYCLES

2004 Jeep Grand Cherokee, candy apple red, fully loaded. Beige leather interior, sun roof. Good cond. $13,000. Call 678-642-4945 or e-mail Jhester@oit.gatech.edu.

2006 Silver Mazda 3i touring sedan. 29K miles, automatic, Perfect cond. Full warranty. Owned by visiting professor, $12,000. Call 404-428-4547 or e-mail mskim@gatech.edu.

REAL ESTATE/ ROOMMATES

For rent: Renovated 3BR/1BA in Clarkston, inside I-285, 10 miles from Tech. Four-sided brick, fenced back yard, all new wiring. New appliances and cabinets in kitchen, new ceramic tile and fixtures in BR. New paint, refinished HW floors. $1,100 deposit and $1,100 monthly rent. Pets OK w/ deposit. Call 404-218-0409 or e-mail regina.rogers@police.gatech.edu.

1B/1B unit at 12 Atlantic Station. Walking distance to Tech, pool, gym and club room. 24-hour security. HW floors, cherry cabinets, granite, SS appliances, large tub, washer and dryer. Unobstructed views of the Atlanta Downtown skyline. $1,100 a month. Call 404-513-1668.

For sale: 1-level, free-standing, 2BR/2BA condo. Exc. condition. New landscaping, near MARTA, in Oak Grove/LaVista area. Walk to restaurants and shops. $177,382. E-mail donna.brown@ibb.gatech.edu.

For Rent: Renovated executive home, 3,000 sq. ft., 3-4BR/2BA. In-town Candler Park family-friendly neighborhood near Tech, Emory and the CDC. Half-mile from MARTA, 1 block from CLIFF bus. Mary Lin Elementary, Inman Middle and Grady High School. $2,450/month + utilities. Call 404-455-3478 or e-mail WhistleRent@Finda.com.

2BR/2BA 1,300-sq.-ft. 2-level town home. Inman Park, 3 miles from campus. Not furnished. 1-year lease, renewable, $1,500/month. E-mail acnq@yahoo.com for pics if interested.

FURNITURE/APPLIANCES

Exercise stepper (Tunturi Tri-stepper 500). $50. Pics avail. Call 404-377-2627 (eve.) or e-mail jdemmers@gatech.edu.

SPORTS/FITNESS/ RECREATION

3BR/2BA peaceful, furnished, waterfront cottage along the Southern Outer Banks, NC; $150/day, 3-day min. Pets OK. Boat slip. More info: http://travel.ajc.com/ads/158. E-mail jud.ready@gatech.edu.

MISCELLANEOUS

Samsung 640 cell phone JPH-AG40 (Sprint). Excellent condition. Text message, games and photos. Comes with home and car charger. $100. Call Ann at 404-407-6171 or e-mail ann.jaudon@gtri.gatech.edu.

Toro riding mower, 42-in. cut. 2 years old, in excellent condition. Sell for $500, cash only. Call Gerald Greene, 894-7571; cell 404-444-1985, e-mail gerald.greene@marc.gatech.edu.

Mac Blue & White G3 w/ 21-in. CRT monitor. 450Mhz/1gbRAM/80gbHDD [brand new w/ fresh copy of OS X 10.4] / CD/DVD-RW/keyboard/mouse/zip. Tons of extras. $350. Call 404.310.5970 or e-mail amartin@oit.gatech.edu.

Check out more ads at **www.whistle.gatech.edu**. Ads appear and run for three weeks in the order in which they are received. E-mail submissions to **editor@comm.gatech.edu**.