

Inside:



In Brief 3

Campus Events 4

THE WHISTLE

FACULTY/STAFF NEWSPAPER

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THE GEORGIA INSTITUTE OF TECHNOLOGY

Tech assists with company's manufacturing processes

Nancy Fullbright
Research News

Spectral Response, a Duluth-based manufacturer of circuit boards, has a lot going for it. It just celebrated its 21st year in business, 70 percent of its workforce has been employed there between five and 10 years, and it won the 2008 Georgia Manufacturer of the Year Award from the Georgia Department of Technical and Adult Education and the Georgia Department of Economic Development.

But Kevin Melendy, president of the company, says Spectral Response had to develop innovative ways of thinking to survive and thrive.

"Like everybody, we faced an onslaught of competition from low-cost manufacturing. We

Assist continued, page 3

El-Sayed awarded Medal of Science

Mostafa El-Sayed, Regents' Professor in the School of Chemistry and Biochemistry, has been awarded the 2007 Medal of Science, the nation's highest honor in the field.

"My goodness. I am very fortunate and lucky to be doing science in America.

There are so many excellent people doing science all over this country," said El-Sayed, who holds the Julius Brown Chair and is also the director of the Laser Dynamics Laboratory. "I want to thank my past and present graduate students and postdoctoral fellows, my colleagues, the administration and staff at Georgia Tech and UCLA who all helped me to do my science and get this honor. There was no limit to the support I received.

El-Sayed's citation reads: "For his seminal and creative contributions to our understanding of the electronic and optical properties of nano-materials and to their applications in nano-catalysis and nano-medicine, for his humanitarian efforts of exchange among countries and for his role in developing the scientific leadership of tomorrow." He



Mostafa El-Sayed

will receive the medal, established by Congress in 1959, at a White House ceremony on Sept. 29.

Currently, El-Sayed is working with his son, Ivan, of the University of California, San Francisco, to develop cylindrical gold nanorods that can bind to cancer cells. Once the cells

are bound to the gold, they scatter light, which makes them easy to detect. Using a laser, they can selectively destroy the cancer cells without harming the healthy cells. The nanorods are tuned to a frequency that allows them to use lasers that can delve under the skin to kill cancer cells without harming the skin.

In addition to his research, El-Sayed still teaches at least one semester of freshman chemistry. This fall, he is scheduled to teach Chemistry 1310, a general chemistry lecture course.

"I will retire when I lose this interest (in teaching), because that's why I'm here," El-Sayed said in an October 2000 article in *The Whistle*.

The National Medal of Science is awarded by the National Science Foundation.

Internal Auditing works to shift focus into consultant role

Robert Nesmith
Communications
& Marketing

According to Director of Internal Auditing Phillip Hurd, the relatively few cases of misuse by state purchasing card holders have caused the department to concentrate on only one aspect of its mandate. Through improved technology and training, the newly named director hopes to realign the office with some of its original intent.

In the late 1990s, Hurd—who came to Tech in 1999—says the office was more of an "old-school" auditing department. Bob Thompson, former executive vice president of Administration and Finance, shifted the department's focus from strictly financial auditing to more of a risk-assessment mandate, which included an entirely different set of criteria. Using sexual harassment in the workplace as an example, Hurd explained that non-budgetary factors can have a direct financial effect on the department or unit. "A hostile environment will drive

Auditing continued, page 3

Advanced Wood Products Laboratory a center for instruction, research

Robert Nesmith
Communications
& Marketing

On the outskirts of campus, the Institute's Advanced Wood Products Laboratory (AWPL) promotes its unique, three-fold mission: Teach, research and promote.

Bridging the gap between both continuing education and academic instruction, the lab, part of the College of Architecture, offers continuing education credits for learning on computer numeric control (CNC) wood-cutting machines as well as a senior furniture design class primarily for Industrial Design (ID) students.

"[CNC] is the industry standard," said Alan Harp, College of Architecture (COA) research scientist and instructor at AWPL. "It offers not only precision, but also repeatability, economy and the ability to change

designs on the fly."

The lab is able to use and instruct on the latest machines thanks to a partnership initiated by the late COA Dean Thomas Galloway. SCM Co., headquartered in Duluth, Ga., provides the precision machines. In return, Harp says that Tech allows SCM to perform demonstrations for its customers.

Cutting class

Each semester, the advanced woodworking class instills in seniors what Harp calls the "Tech directive": Design with the manufacturing process in mind. "The class makes the connection between design and actual construction."

Using computer-aided design (CAD) software, students provide the measurements and designs they want to use. The CNC machines, equipped with a variety of cutting tools and the ability to



Students from last fall's senior design class give their final furniture design presentations to instructors and business representatives.

cut at any necessary angle, use a 4-foot by 8-foot piece of plywood or medium-density fiberboard (MDF) and cut all the pieces out at one time. These automated helpers are essentially an 8-foot-square metal box, with all tools and materials needed safely enclosed. "You effectively cannot design furniture (in a production capacity) without CAD," Harp said. "It's imperative. (Through the class) we're trying to get students to understand what

can be done with CAD and CNC technology.

"I tell every class that the CNC is capable of very accurate mistakes," Harp said. "It's as accurate as your measurements and drawings."

The classes—there also is an Intro to Wood Materials course—are not only for ID students, as Harp recalled instructing a Management major in his latest class.

AWPL continued, page 2

“QUOTE—
UNQUOTE”

“You could have full control over your environment by just being able to move your tongue. Left-up could be turning lights on, right-down could be turning off the TV.”

—Electrical and Computer Engineering Assistant Professor Maysam Ghovanloo, who leads research into a tongue-powered personal computer. (CNN)

AWPL, cont'd from page 1

One caveat with the class: Students must learn the difference between designing on a computer screen and design in reality. “They may never make another piece of furniture in their lives, but now they know the difference between what they sketched and what can be made,” he said. “I’ve been pleased by the quality of output from the students. I’m pleasantly surprised at how well the students do that have never taken on a project of this complexity.”

For the first few weeks of the furniture design course, Harp instructs them about using wood and prepares them for using the shop. Students keep track of their design time and actual fabrication time, which is generally about half-and-half. The more complicated pieces—Harp says—usually need redesign time.

During the last few semesters, students have participated in a design partnership with home furnishings store Crate & Barrel. Students had to make design sketches reviewed by the furniture store, along with a quarter-scale mockup, a full-scale mockup and then a final project—the real piece of furniture. “The majority of students I get have never built anything before, especially furniture.”

And Harp sees a direct benefit to corporate partnership: Establishing a rapport with these companies helps open pathways for his students. “By offering high-quality prototypes to these companies, we’re increasing our students’ interactions with them,” he said.

The Lab also offers continuing education classes throughout the year on machine-compatible CAD programs for professional customers who have purchased a unit from SCM. In the future, Harp wants to expand the lab’s software courses.

Attendees are both individuals and those working in major furniture-design companies. The lab presents two or three courses each month, mostly introductory programming and operation classes for Xilog/AlphaCAM software, which instructs the machines. Both those inside and outside the wood products manufacturing industry are welcomed to take courses.

Computer-aided woodcutting machines make it easier for an individual or a small shop to produce furniture and compete, as the necessary software and a capable CNC machine would cost roughly \$100,000. “One person with this machine would be the equivalent to three without,” Harp said. The Lab also partners with the Center for Assistive Technology and Environmental Access (CATEA).

In the future, Harp wants to expand the lab’s software courses, creating more offerings for professionals. And he wants to educate members of the Institute’s community about what the lab offers. During the summer semester, he instructed a group of Architecture professors about the lab’s services.

Best in show

Twice a year, he takes the ID students to Highpoint Furniture Market in

Highpoint, N.C., to show the variety of computer-designed and CNC-cut furniture available on the market. While some students decide to pursue this as a design career, Tech does not offer a furniture-design program. Harp recommends students to graduate schools with a furniture program.

Regardless of their previous experience—or lack of it—Harp’s students fare well in two biennial national furniture design competitions. Last year, at the Association of Woodworking and Furniture Suppliers (AWFS) Fair in Las Vegas, seven works from Harp’s senior design studio class were chosen—four, each with one piece, won an award. Two won second place in their categories, and two won honorable mention in their categories.

The International Woodworking Machinery & Furniture Supply Fair (IWF), held at the World Congress Center in Atlanta since 1995, returned Aug. 20. In the last two fairs, Harp’s students have been among the 75 finalists showing their works from 600 applicants.

Harp usually sends the best pieces from the class Crate & Barrel projects. For his most recent class, however, he sent everything. “This year’s class is the best overall class I’ve yet had,” Harp said. “There was more ‘quantity of quality’ than before.”

And it shows. Judges selected for finalists 17 pieces by 12 students. For this year’s show, the IWF received more than 300 submissions for the fair. Tech had three winners this year: one third-place winner in Case Goods, and one each in third and second place in the Ready-to-Assemble category.

Real-world research

While teaching both Tech students and professionals takes roughly half of the AWPL’s operations, the Lab is also a center for research. “We are technically a research facility,” Harp said. “Part of the Lab’s directive is to advance the use of technology in the secondary wood products industry through research and outreach.”

AWPL recently secured a grant through the state’s Traditional Industries Program for Pulp and Paper (TIP), a research partnership between the state, the University System of Georgia and its three traditional industries: textiles and carpet, food processing, and pulp and paper. “At AWPL, state-sponsored research focuses on the retail end of the tree’s ‘food chain,’” said Russell Gentry,

IWF Fair honorees



Clockwise from top left: Holly LaPerre, second place in Ready to Assemble; Kelly Hendrix, third place in Ready to Assemble; and Jacob Brooker, third place in Case Goods.

associate director of Research. “Our focus is on the products and processes of product in the retail market.”

Gentry’s group is embarking on the third step of a study on juvenile pine—abundant in Georgia and the Southeast. They are continuing evaluation of juvenile pine

through material characterization and product development, including the development of wood and glass-fiber composites, which could aid the industry in several ways by using the lower-grade lumber in newer ways.

“A lot of these forest resources were grown for the pulp and paper industry,” Gentry said. “(In the states) they’re not being fully used, due to paper-production moving overseas, recycling efforts and less paper usage overall.” Since there currently are no engineering applications or economic incentives for these juvenile pines, landowners are not thinning out their forests, which is needed for the larger trees to mature. “We’re trying to provide motivation for the landowners to do so.”

Testing has yielded very promising results in the technology, Gentry says, but the “economic proof” is lacking. “We are making a stronger wood product with lower-grade material,” he said. “We have yet to demonstrate that it’s economically viable.”

Gentry is currently traveling around the Southeast, working to arrange continued collaboration from companies that would actually manufacture—and benefit from—the products. Results could lead to more profit for lumber-growers.

Harp started working at the Center for Assistive Technology and Environmental Access (CATEA) after earning his ID degree from Tech. “My specific interest is in furniture design,” said Harp, who adds he seeks more interaction with furniture companies from not only a research standpoint, but also from that of design. “My goal is to get more sponsorship in classes,” Harp said. “This also helps broaden our customer base beyond just SCM.”

And Harp’s goals for students extend beyond the class and Institute, as well.

“I tell my students, ‘Once you graduate, keep in touch with me, because it’s your job to help other Tech graduates find jobs,’” Harp said.

For more information...

Advanced Wood Products Laboratory
www.coa.gatech.edu/awpl

Georgia Tech

THE WHISTLE

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Assist, cont'd from page 1

had to find a way to compete," he said. "We had to either fight to survive or try to find new and expanding business segments that have higher margins and less competition, and those just don't exist."

To improve the company's manufacturing process, Melendy turned to Tech's Enterprise Innovation Institute for assistance. Lean specialists Kelley Hundt and Jennifer Trapp-Lingenfelter initially visited Spectral Response to help streamline the way the company initiated product orders. After developing a value stream map—a diagram used to analyze the flow of materials and information required to bring a product or service to a consumer—they suggested the project focus on the entire manufacturing floor plan.

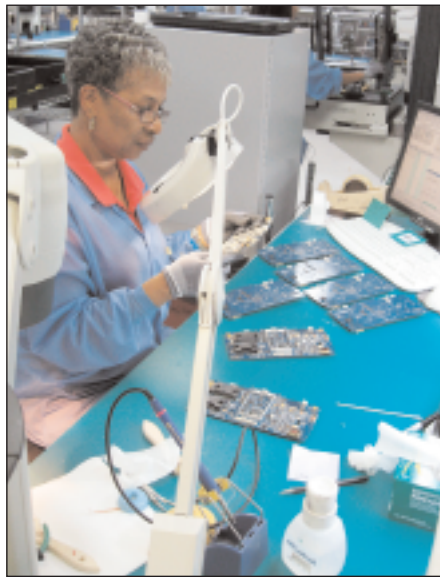
"The factory floor was being driven by the way orders were loaded. If a customer called, we had to figure out a way to get it done, whether it was working nights, weekends or three shifts," Melendy recalled. "But as our business grew and the margin pressures were layered on top of that, we didn't have that luxury any more. We had to take an order from a customer and make sure our supply chain commitments matched up to our manufacturing processes."

After meeting with Spectral Response's leadership, Hundt and Trapp-Lingenfelter both thought the company's manufacturing process would benefit from a cellular design. At the time, the company was

arranged in functional departments that caused excess work-in-process, long lead times and lack of flexibility. Cellular manufacturing, sometimes referred to as cell production, arranges factory floor labor into semi-autonomous and multi-skilled teams that manufacture complete products.

These more flexible cells are able to manage processes, defects, scheduling, equipment maintenance and other manufacturing issues more efficiently.

After training the entire 137-member workforce on lean manufacturing principles, a cross-functional team of eight employees examined the "before" process, brainstormed ideas and used lean tools to highlight areas of improvement. The team decided to shut down operations during the week of July 4, 2007, to rearrange all of the equipment into nine different cellular production lines.



A worker at Spectral Response in Duluth inspects a circuit board before it is shipped to a customer. Tech's Enterprise Innovation Institute assisted the company with improving its manufacturing processes.

Submitted photo

"We used to refer to the floor plan as the snake, and a product had to travel through the entire snake, meaning it was in a single file. If we started a product on Monday, it might be ready to be shipped on Friday," said David Shockley, vice president of operations. "With the cell production, we can have nine parallel lines—much shorter in length—producing nine

products at once. Now, products are ready to be shipped within 48 hours after the order is launched in the system."

Not only did the cellular design reduce the length of time from the order initiation until it was ready to be shipped, but it also helped with orders that needed to be reworked or changed. Todd Owens, lean manager for Spectral Response, estimates that inventory in this area was cut by more than one-third.

"Before, the boards that did not pass the testing area would just get

set aside into what we called the bone pile. We would have to find time to go back and rework them, and that inventory became a significant dollar amount," he said. "Now, we handle the failed boards as we run them through the individual cells. A year ago, the value of the bone pile inventory was more than \$300,000; today, it's around \$80,000."

As a result of lean implementation, Spectral Response has seen a number of impressive impacts. Total work-in-process has decreased by more than one-half, from \$2 million to approximately \$800,000 worth of inventory. Lead times have been cut in half, overtime is down from 15 percent to less than 5 percent, and there is 40 percent more floor space for future growth. Melendy also estimates that the company's electricity bill has decreased by 20 percent, since it is using big, power-hungry equipment less.

"It's easy to quit on this because it's difficult, but ultimately you come out on the other side with a company that's more efficient and better run than when you first started," Shockley noted. "In July 2008, we implemented cell No. 10, our highest volume product. We are committed to this being a never-ending, continual process."

For more information...

Enterprise Innovation Institute
www.innovate.gatech.edu

Auditing, cont'd from page 1

down productivity. It also can lead to huge monetary drains on the department or Institute, in the form of lawsuits."

For the next six months, Hurd says he will work to reposition Internal Auditing as an advocate, educating units and departments on how to self-assess. And prior to the end of fiscal year 2009, one of the office's main goals is to provide a Web-based, self-testing resource for any office to use. "My goal is to move us back into a thought-partnership role, while enhancing the procedures used by the various campus units."

In doing this, the role of the office will shift from that of an investigative unit to more of a consultant. "Other units and departments can come to us for our services, because consulting is part of our mandate. The idea is we're not a 'gotcha' audit group."

The office currently has 10 full-time personnel, and Hurd is hoping to bring two more on board. "One would be a new investigative person who will help us develop evaluation methods that will support fraud deterrence," Hurd says, adding that the focus will again be placed less on tracking down and identifying theft and more on prevention.

In addition to conducting

Institute-wide audits—"145 entities around the campus," Hurd said—Internal Auditing considers risk-mitigation in seven areas: financial, human resources, information systems, legal and regulatory, sexual harassment, health and safety, and general risk. By working with the Office of Organizational Development and on collaborative appraisals for risk assessment and risk management within the units, campus units will have the resources necessary to conduct their own assessments.

"The last few years have been plagued by the inconsistent application of policy across the campus," he said. "Had we had these aggregate methods (already in place), we would have seen the p-card misuse right away. In the next two to three years, I want to change the Institute's culture so that people can recognize risks and avoid them. The vanguard for all elements of risk is the front line office."

Hurd's second priority is for his office to provide executive-level managers with a better overall look at each unit or department. "My approach will



Phillip Hurd

be to integrate our efforts very closely with those executives who mitigate risk and have risk control as their responsibility," Hurd said. "If Internal Auditing can go in and help management become more efficient, then managers can have additional resources such as time and money for research."

Another resource for self-assessment, the department's automated Fraud, Waste and Abuse hotline (1-866-294-5565), is completely anonymous. In keeping with the theme of built-in safeguards, several individuals across campus are notified when a call is made, so one person can't ignore it or forget to follow up.

Hurd wants to remind the departments that since House Bill 1113 went into effect July 1, if his office finds anything unusual—either through conducting an audit or following up on a call—his hands are tied, so to speak. "If I discover something unusual, I'm mandated to investigate, then turn the findings over to the chancellor (of the Board of Regents), who in turn gives the information to the attorney general. Units can and should call us if they have an issue, even if it's a hypothetical situation."

For more information...

Internal Auditing
www.audit.gatech.edu

IN BRIEF:

Ombuds combining

The three Georgia Tech Ombuds functions—faculty, graduate student and staff—will be combined into one office.

Under the new structure, the Ombuds office will report to the Institute president through the Office of the Provost.

Engineering Professor Emeritus Narl Davidson and Physics Professor Emeritus Ed Thomas are the faculty ombuds; Engineering Professor William (Russ) Callen is the graduate student ombuds; and John Schultz is the classified staff ombuds.

While renovations are under way to provide a centralized office, the Ombuds office will remain in Suite 301 at 490 10th Street, near the intersection of 10th and Hemphill. A new Web site is under construction. The phone number will remain 385-6571.

Retired dean Hawkins dies

Robert G. Hawkins, first dean of the former Ivan Allen College of Management, Policy and International Affairs, died in Spencertown, New York, Aug. 22. He was 72.

An economist and academic, Hawkins was dean of the Ivan Allen College from 1992 to 1998. During his tenure, Hawkins helped shape the vision of the college, emphasizing the Institute's role in global economic development.

Prior to helping IAC, Hawkins served as dean of the School of Management at Rensselaer Polytechnic Institute for eight years.

In addition to his early academic career at New York University, Hawkins served as a consultant to the USIA, the U.S. Treasury and the Port Authority of New York.

C A M P U S E V E N T S

Arts & Culture

September 14

Performance artist and musician Laurie Anderson will perform her new show, "Homeland," at the Ferst Center for the Arts, starting at 5 p.m. Tickets are \$34 and \$44, or \$27.20 and \$35.20 with a subscription. For more information, visit www.ferstcenter.gatech.edu.

Conferences & Lectures

September 4

University of California, Berkeley, Professor Stephen Leone presents "Time for Molecular Dynamics," from 3 to 4 p.m. in room G011 of the Molecular Science and Engineering Building. For more information, visit www.chemistry.gatech.edu.

September 9

Bernard Amadei, founder of Engineers without Borders USA, presents the Woodruff Distinguished Lecture, "The Role of Engineers in Poverty Reduction: Challenges and Opportunities," from 11 a.m. to noon in the Ferst Center for the Arts. The event is rescheduled from April. For more information, visit www.me.gatech.edu.

Boston University Assistant Professor Catherine Klapperich presents "Towards the Application of Molecular Diagnostics in Global Health," from 11 a.m. to noon, in room 1128 of the Institute for Bioengineering and Bioscience building. For more information, visit www.ibb.gatech.edu.

September 10

College of Architecture alumni Merrill Elam and Mack Scogin speak as part of the Architecture Centennial Lecture Series, from 6 to 7 p.m., in the Architecture Auditorium. The series, celebrating

100 years of architecture education at Tech, will be ongoing throughout the semester. For more information, visit www.coa.gatech.edu.

Sociologist Jason Owen-Smith presents "Funding Human Embryonic Stem Cell Research: Science and Scientists in Congress," at 1:30 p.m. in room 321 of the Student Center. For more information, visit www.inta.gatech.edu.

September 11

University of California, Irvine, Professor Reginald Penner presents "Ingredients: Metal Nanowires and Viruses—A Recipe for a Universal Biosensor," from 3 to 4 p.m. in room G011 of the Materials Science and Engineering building. For more information, visit www.mse.gatech.edu.

Faculty/Staff Development

September 10

A welcome reception sponsored by the Center for the Study of Women, Science and Technology and the Women's Resource Center for new women faculty and administrators will be held from 3:30 to 5 p.m. in the Klaus auditorium. For more information, visit www.womenscenter.gatech.edu.

September 16

The Undergraduate Research Opportunities Program (UROP) and the Center for the Enhancement of Teaching and Learning (CETL) present "Mentoring Undergraduate Researchers: A Workshop for Faculty, Post-Docs and Graduate Students," from 11 a.m. to 1 p.m. in the Gordy Room of the Wardlaw Center. For more information, visit www.cetl.gatech.edu.

Ongoing

The Office of Organizational Development offers an Emergency Preparedness certificate consisting

of several courses. For more information on scheduling or for other classes offered, visit www.orgdev.gatech.edu.

Miscellaneous

September 5

The Georgia Tech Police Department's Emergency Preparedness Office presents "Get Ready Georgia Tech," from 9 to 11:45 a.m. in room 236 of the Global Learning Center, to show how the Institute is prepared to deal with emergencies. In recognition of September as National Preparedness Month, topics covered include fire safety, weather hazards, suspicious packages and a demonstration by Tech's K9 unit. To register for "GT Safety Day," visit www.trainsweb.gatech.edu.

September 17

Members of the Georgia Tech Presidential Search Committee will explain the process, receive input and answer questions in several one-hour sessions during a public forum, from 9 a.m. to 3 p.m. in the Student Center Theater. For more information on the sessions for faculty, staff and students, visit www.gatech.edu/president/search.

The Georgia Tech Faculty Women's Club holds its fall open house lunch, "Celebrate the Past, Embrace the Future," from 11 a.m. to 1 p.m. in the President's Home. All wives of Institute faculty, women faculty and newcomers are invited. For more information, visit www.gtfwc.gatech.edu.

September 25

Join Georgia Tech's team of the Kaiser Permanente Corporate Challenge 5K, 7 p.m. at Turner Field. Registration is open until Sept. 24 and the cost is \$30 per person. Van transportation will be provided from the Campus Recreation Center. For more information, visit www.crc.gatech.edu.

C L A S S I F I E D S

AUTOMOBILES/MOTORCYCLES

80 MPG! 49cc scooters, vintage and modern. Amazing colors, only \$1,599 with helmet, gloves, warranty, riding lesson. 770-757-6489.

2001 silver Ford Focus ZTS, 109,000 miles. Clean history, gray leather int. Pics. \$6,000, OBO. Call 678-431-4135 or e-mail donna.castenell@business.gatech.edu.

REAL ESTATE/ROOMMATES

Roommate needed: 3BR/2BA house in Douglasville, near I-20. Access to kitchen, living room, laundry (washer and dryer) and large yard. Non-smoking and drug-free environment. \$550. Call 404-610-4547 or e-mail greenjenny1@hotmail.com.

4BR/2.5BA house in Duluth-Norcross area, 25 min. to Tech. 2-car garage, basement, custom kitchen, newer appliances, HW floors, open floor plan. Private back yard w/ oversized deck and hot tub. Cul-de-sac lot, new Leaf Guard gutter. \$254,900, will pay \$2,000 in closing costs with full-price offer. Call Judy Brown, 770-841-4372 or 770-445-3351, or e-mail ds351@gttri.gatech.edu.

4BR/2.5BA w/ basement, off Steve Reynolds Blvd. in Duluth. 30 min. to Tech. \$220,000. Large LR, DR, kitchen, laundry, 2-car garage, fenced garden, 3,400 sq. ft., swim/tennis neighborhood, exc. schools. Call 770-573-9466.

2.76 mountain acres, near Ellijay w/ stream and cabin, only \$34,000. Call Susan Shedd at 706-635-7041 or visit www.Appalachian-Realty.com.

For sale: Large studio time-share in Las Vegas at the Planet Hollywood Towers by Westgate. \$16,000. Avail. any week. For pics and info., visit www.westgateresorts.com/planethollywoodtowers or call 404-317-0183.

For rent, sale: 1BR unit located on 11th floor of Spire Condo at Peachtree and 8th. For info., e-mail jlmihelich@comcast.net.

For sale: 3BR/2BA split foyer w/unfinished bonus 4BR, stubbed 3BA, on half-acre in Dallas, GA. \$165,000. Visit <http://tinyurl.com/4wej2l>. Call James, 404-395-5657.

For sale: 3 BR/3.5BA town-home, end-unit, largest floor plan. Granite, SS appl., hard-

woods, 2-car garage, vaulted ceilings on upper level. 10 min. to CDC and Emory, 15-min. drive to downtown. 5 min. walk to Decatur Square and MARTA. \$305,000. Call 404-364-1267 or visit <http://tinyurl.com/4zfnx8>.

For rent: 2BR/2BA Peachtree Hills, 10 min. from Tech. \$2,000/mth. Spacious, huge deck, private back yard, quiet. Call 404-983-1398 or e-mail bcbh@moab-labs.com.

4BR/4.5BA Buckhead brick home, near 8 acres of natural preserve. Min. to Tech, 3 finished floors, private cul-de-sac setting. Low-maint. yard. Subdivision off Moores Mill Rd. Best schools, shopping and restaurants. Price \$868,000, reduced from \$950,000. Call 404-931-9922 or e-mail enas@enasbazaraa.com.

For sale (\$329K) or lease: 3BR/2BA, 2-level condo just 10 min. east of Tech on Piedmont Park and adjacent to Trader Joe's. Garage, basic cable, water incl. w/ lease. Call 404-281-3876 or e-mail lsuddath@earthlink.net.

For sale: 3BR/2.5BA town-home. \$259,900. 2-car tandem garage, gourmet

kitchen w/ granite, maple cabinets, and lg. breakfast room. Close to downtown, airport and shopping. 15 min. from Tech. Visit <http://tinyurl.com/4aw8qc>. Call Lindsay or Alice, 404-504-0779.

For sale: 5BR/3.5BA home in Powder Springs neighborhood. Exc. schools. HW on first floor. SS appliances and granite in kitchen. Spacious master BR with spa bath. Full daylight basement. Fenced, wooded back yard. \$340,000. MLS ID 3692096. E-mail heather.surrency@ap.gatech.edu for info and pics.

60 acres for sale. Ideal horse farm, min. from Alpharetta. Call 770-479-2179.

SPORTS/FITNESS/RECREATION

Vacation close to home. Roaring River Retreat—3BR/3BA cabin on Coosawattee River in Ellijay. Enjoy tubing, pool, tennis, hiking and much more. Visit www.roaringriverretreat.com or call Molly at 404-407-7731.

Above-ground pool, 5 ft. deep, includes ladder and pump. Only used twice. \$300 or best offer. E-mail jae.collins307@yahoo.com.

FURNITURE/APPLIANCES

Low-boy dresser, 5-foot by 3-foot, 9 drawers, with attachable 3-foot x 3-foot mirror. Dark brown wood. \$40. **Also**, Entertainment center cube, 4-foot square with space for TV, VCR, bookshelves and storage. Dark brown wood. \$20. E-mail rob.luck@library.gatech.edu.

American high-boy chest, dark walnut, very nice, \$285. Roomy locking desk, 5 ft. x 3 ft., hardwood walnut finish. \$225. E-mail linda.newton@ece.gatech.edu for pics, info.

MISCELLANEOUS

Kittens for sale. Call 678-516-6508.

Free yellow jacket and wasp nest removal. Nests to be used for research at Georgia Tech. Call 385-6311 or e-mail michael.goodisman@biology.gatech.edu.

More ads are available 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.