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# THE WHISTLE

FACULTY/STAFF NEWSPAPER

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THE GEORGIA INSTITUTE OF TECHNOLOGY

## Multidisciplinary study touts biofuels as an alternative to petroleum

Significant research and policy effort can supplement transportation fuel needs

Megan McRaine  
 Institute Communications  
 and Public Affairs

With world oil demand growing, supplies dwindling and the potential for weather- and conflict-related supply interruptions, other types of fuels and technologies are needed to help pick up the slack.

A group of experts in science, engineering and public policy from Georgia Tech, the Imperial College London and the Oak Ridge National Laboratory recommend a comprehensive research and policy plan aimed at increasing the practicality of using biofuels and biomaterials as a supplement to petroleum. The review article, called "The Path Forward for Biofuels and Biomaterials," appeared in the Jan. 27 issue of *Science*.

"We can readily address, with research, 30 percent of current transportation fuel needs. But reaching that goal will require 5-10 years and significant policy and technical effort," said Arthur Ragauskas, a professor in the School of Chemistry and Biochemistry and a lead on the project.

While many think of ethanol when they think of biofuels, the group recommends a much broader spectrum of possible materials including



Wood chips used to make bioethanol. Researchers argue that a broader spectrum of biomaterials and improved biomass processing can reduce petroleum usage by one-third.

agriculture wastes such as corn stovers and wheat stalks, fast-growing trees such as poplar and willow and several perennial energy crops such as switchgrass.

In addition to including more diversity in materials, the group also recommends some changes to the plants themselves — using techniques such as accelerated domestication to make them more efficient energy crops. But

*Biofuel continued, page 3*

## Tech to participate in international competition utilizing solar energy

Project envisions broad participation across academic and research units

Matt Nagel  
 Institute Communications  
 and Public Affairs

The U.S. Department of Energy selected Georgia Tech as one of 20 schools that will compete in the Solar Decathlon 2007 in Washington, D.C.

Each team will be awarded \$100,000 over two years to support the project goal of reducing the cost of solar-powered homes and advancing solar technology.

The Solar Decathlon is an international competition that brings student teams from universities across the United States, Europe and Canada to compete in designing, building and operating highly energy efficient, completely solar-powered houses. The teams will assemble their homes on the National Mall in a two-week competition.

Held every other year, contest rules require that each house generate enough energy from the sun

to operate a household, a home-based business and related transportation.

Georgia Tech's team will be led by College of Architecture Associate Professor Chris Jarrett, Assistant Professor Ruchi Choudhary and Assistant Professor Franca Trubiano, and will act as project managers for an interdisciplinary team of students who will be assembled to create the home.

"Building Ecology and Emerging Technologies is a new study track within master's program in the College of Architecture, and it offered an impetus to submit a bid for the Decathlon," Trubiano said. "We thought the Solar Decathlon could be a project that would structure, organize and then propel the Building Ecology and Emerging Technologies study track."

The team of project managers began the process of being invited to participate by putting together a proposal to be included in the event.

"One of the terrific things about this project is we're collaborating with both the College of Engineering and

*Decathlon continued, page 3*

## Chancellor to address System via webcast

As of Feb. 6, Erroll Davis assumes his new duties as chancellor of the University System of Georgia. This week, he will extend personal greetings to the USG campuses and, in a separate address, make his first report to the Board of Regents.

His talks will be streamed live via webcast to the Georgia Tech campus. The Global Learning and Conference

Center at Technology Square has reserved conference room 236 for those who wish to attend.

**What:** Initial greeting and first report  
**When:** Feb. 7 at 1 p.m.  
 Feb. 8 at 9 a.m.  
**Where:** Room 236, Global Learning and Conference Center

## In memoriam 1927-2006

The Georgia Institute of Technology wishes to extend its deepest sympathy to family, relatives and admirers mourning the loss of civil rights pioneer Coretta Scott King.



“QUOTE—  
UNQUOTE”

“There are a lot of people who are going to be very unhappy on the third of February.”

—College of Computing Professor Merrick Furst, on the malicious software known as the Kama Sutra worm, which exploits a flaw in Microsoft Windows to destroy files on infected machines.  
(CNN.com)

## High-performance computing agreement announced

The College of Computing at Georgia Tech, Oak Ridge National Laboratory (ORNL) and UT-Battelle today announced a wide-ranging collaborative agreement to share facilities, staff and scientific resources aimed at significantly increasing the United States' capability to carry out large-scale research efforts reliant on advanced super-computing technology. This unique, public-private collaboration is expected to position the Southeast as a key center in high-performance computing research and development.

“The College of Computing was created to make it easier to partner with leading research centers and academic institutions and to elevate computer science research and education on a national and global scale,” said Richard DeMillo, dean of the College of Computing. “We firmly believe that this partnership will create a one-of-a-kind environment and help reinvigorate U.S. capabilities in supercomputing.”

As part of the agreement, Thomas Zacharia, associate laboratory director for ORNL's Computing and Computational Sciences Directorate, will be appointed as a professor in Tech's College of Computing. Subsequent joint appointments of faculty and staff, as well as an ongoing distribution of research students and computing resources, will follow in the coming months. In addition, with support from UT-Battelle — the non-profit partnership between the University of Tennessee and Battelle charged with managing ORNL operations — the College's Computational Science and Engineering Division will open a campus at ORNL dedicated to advanced computational science and engineering research and graduate education.

“This agreement represents a milestone for Oak Ridge National Laboratory,” said Director Jeff Wadsworth. “This creative partnership will bring closer together the extraordinary computational capabilities of

both Georgia Tech and ORNL. Together, the partnership will represent one of the world's greatest resources for high-performance computing.”

### Selected research projects expected to benefit from the ORNL collaboration

- Georgia Tech researchers in the field of systems biology, who integrate mathematics, physics, chemistry and biology with high-performance computing and engineering in order to harness the vast information growing out of the sequencing of the human genome and apply it to the detection and prevention of diseases
- Researchers in the School of Physics, who employ computer-based nanoscale simulations to discover new technologies that can be used to store massive amounts of information in a compact space

## Tech develops technology for compact, inexpensive spectrometers

Megan McRaney  
Institute Communications  
and Public Affairs

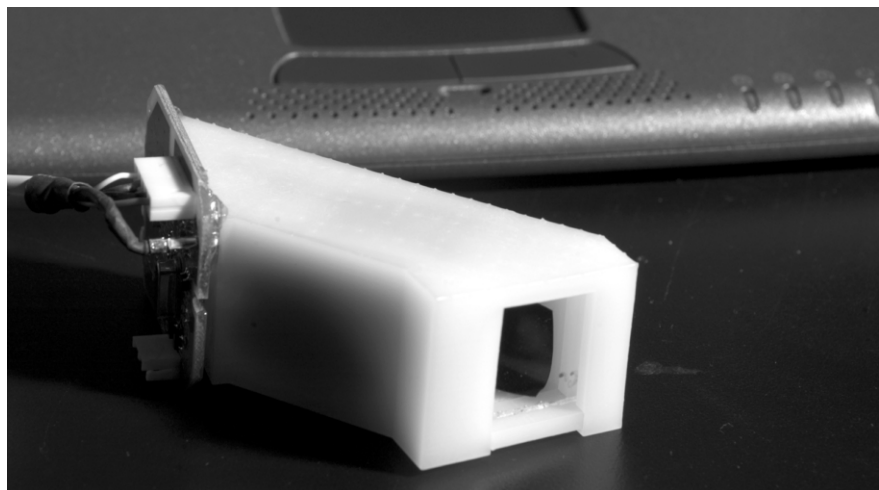
Being the delicate optical instruments that they are, spectrometers are pretty picky about light.

But Georgia Tech researchers have developed a technology to help spectrometers — instruments that can be used as the main parts of sensors to detect substances present in ultra-small concentrations — analyze with fewer parts in a wide variety of environments, regardless of lighting. The technology can improve portability, while reducing the size, complexity and cost of many sensing and diagnostics systems that use spectrometers.

Conventional spectrometers have multiple parts: a narrow slit, a lens to guide light, a grating to separate wavelengths, a second lens and a detector to detect the power at different wavelengths. The Georgia Tech team's goal was to combine all these pieces into two parts — a volume hologram (formed in an inexpensive piece of polymer) and a detector — to create a compact, efficient and inexpensive spectrometer that could be used for multiple spectroscopy and sensing applications.

“This technology is very useful for low-end spectrometers, but at the same time, there are many applications that require high-end spectrometers,” said Ali Adibi, head of the project and an associate professor in the School of Electrical and Computer Engineering. “This technology could convert a portion of a complex, high-end system into a much more versatile and light system.”

Because of its light weight, the



Associate Professor Adibi's research team has produced a prototype of their technology.

new design helps create more versatile and portable spectrometers for several applications where portability had been difficult. For instance, the technology would make handheld devices possible for carbon monoxide detection or on-the-spot blood analysis and other biomedical applications.

Another of the key advantages to the new spectrometer is its relative insensitivity to alignment. Spectrometers are very sensitive to both the direction and wavelength of light — in fact, several of its parts are devoted to keeping the light correctly directed.

But the research team was able to incorporate those necessary alignments together with the focusing functions into a volume hologram. This hologram is recorded by the interference pattern of two beams in a piece of photopolymer.

“There were lots of challenges because the light we need to analyze is diffuse in nature,” Adibi said.

Spectrometers work the best under collimated light (i.e. light moving in only one direction). In conventional spectrometers, this problem is solved by blocking light in all but one direction using a slit and a lens, but results in considerable power loss and lower efficiency.

“By choosing the appropriate hologram, we have no collimating hardware in our system,” Adibi said. “We have further demonstrated the capability of improving the throughput by using more complex holograms (that are recorded similar to less complex holograms) in our spectrometer without adding to the actual complexity of the system.”

The team has a prototype for a lower-end spectrometer comparable to those currently on the market but for a considerably lower cost. According to Adibi, the research team will now focus on developing systems to improve the efficiency — and thereby the sensitivity — of its spectrometers.

Georgia Tech



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

*Decathlon, cont'd from page 1*

the College of Sciences," said Jarrett.

The Georgia Tech team will be truly multidisciplinary with collaborators from the College of Architecture, the School of Electrical and Computer Engineering, the Center for Biological Inspired Design and the Institute for Sustainable Technology and Development.

Teams are judged in 10 categories, seven of which focus on energy efficiency; others include design and comfort of the house. The team with the most points — the most energy-efficient and innovatively designed house — wins.

"Our faculty, staff and facilities are going to be our strengths," said Jarrett. "Our Advanced Wood Products Lab and our expertise across the campus will also make our team very competitive."

"This is the kind of project where getting to the finish line isn't the goal," said Trubiano. "We are in this to win."

The Georgia Tech team is already starting to prepare for the Decathlon by preparing to raise money and sponsors for the event. The team is also looking for space around campus to begin building.

"One of the major starting points is fundraising, and that's where we are now," said Jarrett.



This concept house was built by students at the University of Colorado, which won the competition in 2005.

"We need to deliver a fundraising report and know where the funding is coming from by mid-March."

For more information...

**Solar Decathlon**

[www.eere.energy.gov/solar\\_decathlon](http://www.eere.energy.gov/solar_decathlon)

**College of Architecture**

[www.coa.gatech.edu](http://www.coa.gatech.edu)

*Biofuel, cont'd from page 1*

doubling the productivity of energy crops will mean identifying constraints and correcting them with genomic tools.

To make biofuels a truly practical alternative to petroleum, the group says there will need to be significant improvements in how biofuel is processed. Their vision is for a fully integrated biorefinery, designed to take advantage of advances in plant science and innovative biomass conversion processes and equipment to produce fuels, power and chemicals from biomass.

The biorefinery would work much like a petroleum refinery, which produces multiple fuels and products from petroleum.

The group based its recommendations on research studies, including studies on the development of rapid-growth, high-energy content trees and perennials, novel environmentally friendly biomass extraction technologies, innovative catalysts for the conversion of agriculture and wood residues to bioethanol/diesel and hydrogen, bio-fuel cells and next-generation green plastics and materials prepared from sustainable sources such as plants, sunlight and wastes.

For more information...

**School of Chemistry and Biochemistry**

[www.chemistry.gatech.edu](http://www.chemistry.gatech.edu)

## IN BRIEF:

### Open call for Nunn Security Fellowship applications

Co-principal investigators John Endicott, professor of international affairs and director of the Center of International Strategy, Technology and Policy (CISTP); and Seymour Goodman, professor of international affairs and computing, are now accepting applications for the Sam Nunn Security Fellowship. The Sam Nunn Security Program is committed to educating scientists and engineers on national security issues and providing the analytical tools they need to interact with the policy community.

Funded by the MacArthur Foundation's Science, Technology and Security Initiative, the Nunn Security Program selects pre-doctoral, post-doctoral and faculty scientists and technology experts for intensive year-long training in research approaches and policy formulation methods for addressing national and international security issues. The application deadline is March 17. Applications are available online at [www.cistp.gatech.edu/snsp/index.htm](http://www.cistp.gatech.edu/snsp/index.htm).

### Seeking teachers for GT 1000

The Office of Success Programs is seeking volunteers to teach a section of GT 1000, a freshman seminar helping new students adjust to college life.

Assistant Director of Success Programs Paddy Kennington says, "Every fall, new students arrive on campus with many questions, high hopes for success and lots to learn. This course helps to introduce them to campus culture, as well as the resources and opportunities we have here."

Instructors must hold a master's degree, have been employed at Tech for at least one year, and have their supervisor's support.

For more information, visit [www.successprograms.gatech.edu](http://www.successprograms.gatech.edu) or e-mail [drpaddyk@gatech.edu](mailto:drpaddyk@gatech.edu).

### CIBER Business Language Conference calls for papers

The 2006 Center for International Business Education and Research (CIBER) Business Language Conference will be held April 5-8 at the Georgia Tech Hotel and Conference Center. The conference joins educators and administrators in the fields of foreign language, culture and area studies, business and management for sessions and workshops on all aspects of internationalizing the curricula of schools to prepare students for the global marketplace. The organizers — the School of Modern Languages and the Center for International Business Education in the College of Management — have focused this year's conference on improving classroom foreign language instruction, curriculum development and materials selection, increasing study abroad, internships and other enrichment opportunities for students.

Paper proposals are due by Feb. 17. Proposals are welcomed in English and the target language for papers on any aspect of the conference theme, "Matters of Perspective: Culture, Communication and Commerce." To submit a proposal and for more details about the conference, visit [www.modlangs.gatech.edu/ciber](http://www.modlangs.gatech.edu/ciber).

## Awards & Honors

The Institute for Operations Research and Management Sciences, which recognizes research excellence in the field of health care management, has awarded its 2005 Pierskalla Award to Professor **Eva Lee** (Industrial and Systems Engineering) for her research in "Emergency Treatment Response and Real-Time Staff Allocation for Bioterrorism and Infectious Disease Outbreak."

For his work in the biotechnology industry, Assistant Professor **Frank Rothaermel** (College of Management), has been awarded a 2006 Sloan Industry Studies Fellowship, a two-year grant that supports junior faculty from a wide array of academic disciplines, including management, economics, engineering and political science.

Assistant Professor **Victor Breedveld** (Chemical and Biomolecular Engineering) has been named a recipient of a CAREER award from the National Science Foundation.

The Association for Computing Machinery (ACM), has recognized two professors for their contributions to both the practical and theoretical aspects of computing and information technology. Professor **Krishna Palem** (Electrical and Computer Engineering and the College of Computing), was named an ACM Fellow for contributions to compiler optimization and embedded computing. Professor **Vijay Vazirani** (College of Computing) was named an ACM Fellow for contributions to optimization and approximation algorithms.

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

## Art & Culture

### Feb. 10-11, 15-18

DramaTech Theater performs the Pulitzer Prize-winning "Proof," by David Auburn at 8 p.m. For tickets and information, visit [www.dramatech.org](http://www.dramatech.org) or call 894-3481.

### Feb. 11

The Ferst Center welcomes Julio Bocca and Ballet Argentino for an 8 p.m. performance of "Bocca Tango." For tickets, call 894-9600 or visit [www.ferstcenter.org](http://www.ferstcenter.org).

### Feb. 12

The Ferst Center welcomes the Aquila Theater Company for a 5 p.m. performance of "Hamlet." For tickets, call 894-9600 or visit [www.ferstcenter.org](http://www.ferstcenter.org).

## Brown Bags/Conferences/Lectures

### Feb. 8

The IMPACT Speaker Series continues with John Wells, president and CEO of Interface Americas, at 4:30 p.m. in the LeCraw Auditorium.

### Feb. 14

Professor Walt de Heer will be the featured speaker at the next meeting of the Nano@Tech Volunteer Group, on "Nanopatterned Epitaxial Graphene: A Route to Carbon-based Nanoelectronics," at noon in room 102A, MiRC. To register, e-mail [paul.turgeon@mirc.gatech.edu](mailto:paul.turgeon@mirc.gatech.edu) or visit [grover.mirc.gatech.edu](http://grover.mirc.gatech.edu).

### Feb. 14

The School of Aerospace Engineering's Distinguished Lecture Series welcomes John

Logsdon, director of the Space Policy Institute at George Washington University's Elliott School of International Affairs, on "Prospects for Space Exploration: The View from Inside the Beltway," at 11 a.m. in the Clary Theater. For additional information, e-mail [cindy.pendley@ae.gatech.edu](mailto:cindy.pendley@ae.gatech.edu).

### Feb. 15

Living Game Worlds, a symposium featuring leading digital designers and design theorists, will be held in the Technology Square Research Building. For more information, visit [www.gameworlds.gatech.edu](http://www.gameworlds.gatech.edu).

### Feb. 15

The IMPACT Speaker Series continues with John Owen, president and CEO of Assurant Specialty Property, at 4:30 p.m. in the LeCraw Auditorium.

### Feb. 16

The School of Mechanical Engineering welcomes Regis Babinet, counselor for nuclear energy in the French embassy, on "Nuclear Energy Policy in France: European Context and Environmental Issues," at 11 a.m. in the MARC auditorium. For more information, call 894-3601 or e-mail [nolan.hertel@me.gatech.edu](mailto:nolan.hertel@me.gatech.edu).

## Faculty/Staff Development

### Feb. 15

The Office of Organizational Development sponsors a class in, "Successful Meeting Management," at 8:30 a.m. in room 308, Savant Building. To register, visit [www.trainsweb.gatech.edu](http://www.trainsweb.gatech.edu).

### Feb. 23

Tech's ADVANCE Program offers a lunchtime workshop on "Strengths Management Techniques," led by Civil and Environmental Engineering Associate Professor Adjo Amekudzi. For more information,

visit [www.advance.gatech.edu](http://www.advance.gatech.edu). To reserve a seat, e-mail [angela.shartar@oars.gatech.edu](mailto:angela.shartar@oars.gatech.edu).

## Miscellaneous

### Feb. 6-10

Jazzman's Café, located in the Library and Information Center, will have its grand opening week, offering discounted food and beverages, as well as other promotions. For complete details, visit [www.gatechdining.com](http://www.gatechdining.com).

### Feb. 7-8

Campus Recreation Center's G.I.T. FIT Program and HealthCheck Services will be providing health screenings from 7:30 - 10:30 a.m. in room 240 at the CRC. All tests are reviewed by a physician. Appointments must be made in advance by e-mailing [brooke.nicholas@crc.gatech.edu](mailto:brooke.nicholas@crc.gatech.edu). For more information, visit [www.crc.gatech.edu](http://www.crc.gatech.edu).

### Feb. 8

A series of pre-retirement meetings will be held by the Office of Human Resources for employees who are within ten years of retirement. This section, covering Social Security benefits and Georgia Tech benefits, will be held in room 117, Student Services Building from 1:30 - 4:30 p.m. To register, visit [www.trainsweb.gatech.edu](http://www.trainsweb.gatech.edu).

### Feb. 15

The second of two pre-retirement meetings will be held for employees who are within ten years of retirement. This section, covering Teacher's Retirement benefits and optional and supplemental retirement benefits, will be held in room 117, Student Services Building from 1:30 - 4:30 p.m. To register, visit [www.trainsweb.gatech.edu](http://www.trainsweb.gatech.edu).

E-mail calendar events to [editor@icpa.gatech.edu](mailto:editor@icpa.gatech.edu) as soon as dates are confirmed.

# C L A S S I F I E D S

## **AUTOMOBILES**

1995 Ford Escort LX wagon. New tires, new brakes, new battery. Runs great. 169K miles. \$1,000. Call 770-973-7212.

1996 Lexus 400, Excellent condition rating from CarFax, beige leather interior, gold exterior, luxury vehicle features, 132K miles, \$8,700. All reasonable offers considered. Call 404-349-1329 or e-mail [jcaka81@earthlink.net](mailto:jcaka81@earthlink.net).

## **FURNITURE**

Moving sale: Storehouse Java queen bed, night stands; Ethan Allen entertainment unit and coffee table; Crate & Barrel dining table and chairs; crib and bedding set; rocking chair; futon. All less than 5 years old. E-mail [anping@bellsouth.net](mailto:anping@bellsouth.net) for pictures.

Coffee table with two matching end tables. Oak finish. Very good condition. \$75 for set. E-mail [rita.brown@edi.gatech.edu](mailto:rita.brown@edi.gatech.edu) for pictures or call 770-928-7344.

## **REAL ESTATE/ROOMMATES**

R3/4-acre lot at Turtle Cove on Lake Jackson, common property access

to water, \$14,500. Call 478-825-5504.

1BR/1BA condo in Vinings Run swim and tennis community. \$90,900. For more information, call 770-356-6162, e-mail [scott.sergeant@housing.gatech.edu](mailto:scott.sergeant@housing.gatech.edu), or visit [www.forsalebyowner.com](http://www.forsalebyowner.com), ad #20577381.

1BR/1BA, street-level garden condo at 3609 Essex Avenue, Vinings. Swim, tennis, stream and private woods view. No stairs, motivated seller. \$139,900. E-mail [pnelson3609@comcast.net](mailto:pnelson3609@comcast.net) or call 770-541-6769.

2BR/2BA authentic loft in Castleberry Hills, two miles from campus. Amenities include high-speed internet, swimming pool, dog run, and roof top deck. Visit [www.lofts-of-atlanta.com](http://www.lofts-of-atlanta.com) (GE Lofts #112), or call 404-688-8098.

3BR/2BA, two-story home in Underwood Hills near Atlantic Station. Move-in condition with new

carpet, roof and HVAC. Landscaped back yard fully fenced for privacy and security. Renting for \$2,200/month. E-mail [ngpinc5@aol.com](mailto:ngpinc5@aol.com).

4BR/3BA, furnished house for rent in Dunwoody Redfield area. Excellent schools, includes swim and tennis facilities and 1.5 miles to MARTA. Available Aug. 2006 for \$1,800 /month + utilities. Contact [yves.berthelot@me.gatech.edu](mailto:yves.berthelot@me.gatech.edu).

2BR/2BA home in Home Park with 2-car garage. Walk to GT and the Midtown business district. Available March 1. Month-to-month or longer term available. \$1475/month. For more information, visit [www.tech-tutors.com/calhoun.htm](http://www.tech-tutors.com/calhoun.htm).

2BR/2.5BA townhome 1.5 miles from campus in gated community. Great roommate plan with 2 master suites, hardwood floors, 10 ft. ceilings, gourmet kitchen, new HVAC, private patio, 2-car garage. \$260,000. Call 404-849-2778.

## **MISCELLANEOUS**

Dog cage, 28"x42"x25". Excellent for crate training. \$40. Call 678-687-7884.

New home needed for a 5-year-old male Border Collie, named Chad. He is microchipped, house- and crate-trained with basic obedience covered. Chad comes from national herding champion family line. Price negotiable. E-mail [Lou32@yahoo.com](mailto:Lou32@yahoo.com).

Free: three male guinea pigs born Feb. 2005 with special cage that houses all three. Family has grown, and we do not have room for these adorable animals. E-mail [kathy@cc.gatech.edu](mailto:kathy@cc.gatech.edu) or call 770-942-8315.

E-mail ads to [editor@icpa.gatech.edu](mailto:editor@icpa.gatech.edu). Due to the volume of submissions, ads run for three consecutive issues and appear as space is available.