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THE WHISTLE

FACULTY/STAFF NEWSPAPER VOLUME 27, NUMBER 23 • JULY 15, 2002 THE GEORGIA INSTITUTE OF TECHNOLOGY

President Clough heads task force to fix city sewers

Advisory panel will recommend best course of action

David Terraso
Institute Communications and Public Affairs

First the Governor called for help fixing the state's natural gas market, and now Atlanta Mayor Shirley Franklin is asking President Clough to help solve the city's sewer problem. Last month, Clough chaired the first of four meetings of the Mayor's "Clean Water Advisory Panel," which will review the city's $3 billion plan to fix the sewers that run under Atlanta's central core.

"I want the best advice possible as we make these critical decisions. Through Dr. Clough's committee, I know I will get that," said Franklin.

Clough personally selected the nine-member panel for its technical expertise and its independence from Atlanta politics. All of the members are nationally known experts in civil engineering, wastewater treatment or public health. Many of them have designed sewer plans for other large cities, such as Chicago and Washington, D.C. (see chart below).

The city was forced to come up with a plan to fix the central sewers as a result of a 1998 consent decree that arose from a lawsuit filed by the Chattahoochee Riverkeeper and property owners downstream of Atlanta. The suit claimed that the 19 square miles of sewers running under the city's central core violate the water quality standards set forth by the state's Environmental Protection Division and the federal government's Environmental Protection Agency. The decree gives the city until 2007 to meet the standards.

photo by Annemarie Poyo

President Clough was chosen by Mayor Shirley Franklin to lead the panel.

The sewers at issue are the city's oldest, with some more than 100 years old. While sewers that were built after 1920 have separate systems for handling wastewater and stormwater, the ones built before mix the two. The problem is that these combined sewers weren't

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Mayor Franklin's Clean Water Advisory Panel

Wayne Clough (chairperson) president, Georgia Tech

John Hall, president and founder, Transformational Consultants International

Lawrence Roth, deputy executive director and chief operating officer, American Society of Civil Engineers (ASCE)

Jefferson Hilliard, consultant with specialties in transportation, water and geotechnical engineering

Cecil Lue-Hing, principle, Cecil Lue-Hing and Associates Inc., Chicago

Mike Marcotte, chief engineer, District of Columbia Water & Sewer Authority

Billy Turner, president, Columbus (Ga.) Water Works

Bruce Beck, professor, University of Georgia.

Nancy Wheatley, environmental consultant

Learning to fly

photo by Gary Meek

When it comes to piloting an aircraft, Georgia Tech researchers are hoping to develop software that can perform to the level of a human being, both in terms of integrating subsystems and averting risk. Above, researchers pose with GTMAX, Tech's test bed unmanned aerial vehicle (UAV). From left, they are: Aerospace Engineering Professor Dan Schrage, computer engineering undergraduate Henrik Christophersen, Aerospace Engineering Professor Eric Johnson, Aerospace Engineering Research Engineer Jeong Hur and Electrical and Computer Engineering Professor George Vachtsevanos. For the complete story, see page 2.

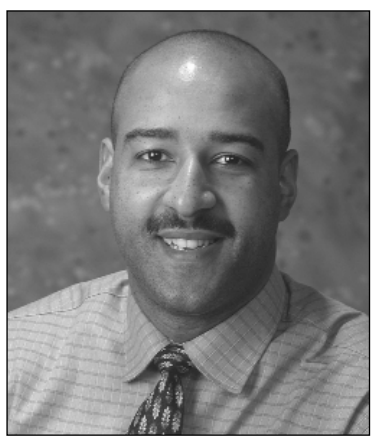
President Bush honors Zhang, DesRoches as top researchers

Sean Selman
Institute Communications and Public Affairs

On July 12, President George W. Bush recognized two professors from Georgia Tech as being among the nation's most promising young researchers within their fields.

Assistant Professor Reginald DesRoches, a researcher in the School of Civil and Environmental Engineering, and Associate Professor Z. John Zhang, a scientist in the School of Chemistry and Biochemistry, are recipients of the 2001 Presidential Early Career Awards for Scientists and Engineers (PECASE).

The PECASE awards are the nation's highest honor for professionals working at the outset of their independent research careers. DesRoches and Zhang were among 60 scientists nationwide to be honored by President Bush at the White House ceremony.



Reginald DesRoches

The annual awards were established in 1996 to honor outstanding scientists and engineers who show exceptional potential for leadership at the frontiers of knowledge and whose work is of greatest benefit to the nominating agency's mission. Eight

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"QUOTE— UNQUOTE"

"We're open to all sorts of ideas to improve crossings of the interstate."
—Scott Levitan, executive director for real estate development at Georgia Tech, on recent outside proposals to add an additional park plaza along the Fifth Street bridge, which serves as the connector between the main campus and Technology Square.
(Atlanta Journal-Constitution)

"The library's mission in the old days was to acquire, organize, and make information available. It's being rearticulated now as a pointer, an entity that provides a way to link users and knowledge together — to be a portal, an organized entree to information. And it's not just physical. It's also virtual."
—Richard Meyer, dean and director of the Library and Information Center, on the growing role of technology in libraries.
(Chronicle of Higher Education)

Who's flying the plane? Before long, it could be a computer

John Toon
Research News

photo by Gary Meek

Aerospace Engineering's Professor Eric Johnson (left) and Research Engineer Jeong Hur adjust components on GTMAX, Tech's test bed unmanned aerial vehicle (UAV).

Recent world events have highlighted the utility of unmanned aerial vehicles (UAVs) for both military and civilian applications. In manned aircraft, the pilot is in control, functioning as the integrator of the on-board subsystems and mitigating problems when they occur. With the advent of UAVs, this capability is lost, increasing the probability of aircraft loss and/or mission failure.

To address this and other related UAV control issues, the Defense Advanced Research Projects Agency (DARPA) and the U.S. Air Force Research Laboratory (AFRL) have launched a major initiative to develop revolutionary new software-enabled control (SEC) systems with applications to intelligent UAVs.

The Boeing Phantom Works and Georgia Tech recently demonstrated a key component of the SEC program: an Open Control Platform (OCP) designed to give future UAVs more capable flight control systems. In the demonstration — using the Georgia Tech test helicopter known as GTMAX — the Open Control Platform successfully compensated for the simulated in-flight failure of a low-level flight control system by reconfiguring the SEC software systems autonomously.

"This demonstration represents an important step toward the goal of changing the way air vehicle control systems are designed," said Daniel Schrage, a professor of aerospace engineering at Georgia Tech and co-principal investigator for the project with George Vachtsevanos, a Georgia Tech professor of electrical and computer engineering.

The test was one of a series of technology demonstrations planned for completion during the next two years. Future experiments are intended to demonstrate extreme UAV performance and coordinated control of multiple vehicles in the execution of a mission scenario.

Researchers from more than a dozen organizations participating in the program will use the OCP's capabilities to evaluate and demonstrate the breakthrough control technologies they are developing. The OCP will also provide a showcase for advances in future control capabilities, including the ability to coordinate and control multiple UAVs from piloted air vehicles.

"Achieving this kind of performance from the open control platform is a real milestone," Schrage noted, "but we still have a long way to go in realizing the goals of this effort, including ensuring the flight safety of these UAVs."

Beyond the reliability of responding to unexpected system faults, the SEC program will also give the machines more agility, helping them to avoid hostile actions without exceeding critical flight parameters.

"Current UAVs are not robust enough to deal with all the circumstances they may encounter," said Vachtsevanos. "This program is creating the technologies to make this type of vehicle more reliable, robust and truly autonomous."

The SEC program plans a number of progressive technology demonstrations over the next two years. While the May 7 benchmark demonstration was a major accomplishment, Schrage said, the additional planned demonstrations will go a long way toward transferring the SEC technologies, including the OCP, to the UAV community.

Georgia Tech

THE WHISTLE

Editor: Michael Hagearty

Published by Institute Communications and Public Affairs.

Publication is weekly throughout the academic year and biweekly throughout the summer.

The Whistle can be accessed electronically through the Georgia Tech web page, or directly at www.whistle.gatech.edu.

E-mail Whistle submissions to michael.hagearty@icpa.gatech.edu, or fax to Michael at 404-894-7214 at least 10 days prior to desired publication date. For more information, call 404-894-8324.

Cost/$675 Copies/5,200

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

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participating agencies award these young scientists and engineers with up to five years of funding to further their research in support of critical government missions.

DesRoches earned his PECASE award through the National Science Foundation for his work in earthquake-hazard mitigation. He will receive a $376,000 award, spread over five years. DesRoches has worked for Mobil Oil in its offshore engineering group and has research interests that include earthquake engineering, seismic design and analysis of bridges, and structural applications of smart materials.

"I am delighted that the quality of Reggie's scholarship has been recognized with a PECASE award," said College of Engineering Distinguished Professor Bruce Ellingwood. "The extraordinary quality of our young faculty will ensure a bright future for the School's teaching and research missions in civil and environmental engineering."

Professor Roberto Leon, interim head of the School of Civil and Environmental Engineering, added his praise.

John Zhang

"Dr. DesRoches is conducting pioneering research on design of bridges for earthquake loads and the application of advanced materials to the repair and strengthening of structures," Leon said. "This award is a recognition of the impact and importance of his work."

Zhang earned his nomination for a PECASE award from Sandia National Laboratory — a U.S. Department of Energy National Nuclear Security Administration Defense Programs Laboratory — for his innovations and vital contributions to the development of new tools, materials and applications that advance the science of component microfabrication from materials other than silicon.

These advances enhance the ability of the National Nuclear Security Administration to develop improved components for weapon systems. Zhang will earn $250,000 over the next five years to pursue his work at Georgia Tech.

"It was a distinct and real pleasure for me to learn that John Zhang has been selected for a PECASE award," said Gary Schuster, dean of the College of Sciences. "John's selection for the award recognizes his strong and growing impact in materials chemistry, particularly in the area of nanoparticles. His research has taken our understanding of these unique materials beyond the cutting edge into territory that was unimaginable only a few years ago."

For more information...

School of Chemistry and Biochemistry
www.chemistry.gatech.edu

School of Civil and Environmental Engineering
www.ce.gatech.edu

Students win fellowship research awards from NASA

Larry Bowie
Institute Communications and Public Affairs

Two Georgia Tech students have been selected by NASA to receive a prestigious fellowship award that provides support to women, minorities and persons with disabilities for graduate education leading to doctoral degrees in NASA-related disciplines.

Brandy Rogers, who is pursuing a doctoral degree in biomedical engineering, and Ramiro L. Rivera, who is pursuing his doctorate in mechanical engineering, received awards from the NASA/Harriett G. Jenkins Predoctoral Fellowship Program (JPFP).

The mission of the fellowship program is to increase the number of women, minorities, and people with disabilities participating in the math, science, engineering and technology disciplines.

"The program is truly one of a kind," said Rogers, 23, of Warner Robbins, Ga., whose research interests focus on biomaterials and cellular biomechanics. "It not only provides financial assistance for graduate studies, but also mentoring, academic guidance and NASA research facilities."

Rivera, a 23-year-old from Puerto Rico whose main research interests are heat transfer, combustion and energy systems, begins his second year of graduate school in mechanical engineering next fall, said, "It is an honor to receive and bring to Georgia Tech a fellowship that carries the name of such an extraordinary woman. Dr. Jenkins, whom the award honors, is truly a role model that we should all try to emulate."

Up to 20 fellows are selected each year, with tuition and stipend funds available for up to three years. In addition, JPFP Fellows will also be mentored and participate in annual, hands-on research experiences at NASA centers across the country.

The fellowship program is named in tribute to Harriett Jenkins, the former assistant administrator for Equal Opportunity Programs at NASA. Jenkins is known for her outstanding contributions to the nation's technical aerospace industries and institutions of higher education through support and development of programs designed to increase the pool of highly trained and educated minority and female scientists and engineers.

Fellows are also given the opportunity to compete to participate in "research minigrants" that provide them with a hands-on NASA research experience that is closely related to the research experience at the fellow's institution. The fellows must write a research proposal in conjunction with the NASA mentor and the faculty advisor for this opportunity.

Other opportunities include a Graduate Student Technical Exchange Symposium, which provides an audience of scientists, engineers and faculty advisors for the fellows to deliver presentations on their chosen research project.

Tech to host nationally televised games vs. Clemson, BYU

Georgia Tech's football games against Clemson and Brigham Young have been selected for broadcast by ESPN and ABC, respectively, as part of the television schedule announced last week by the Atlantic Coast Conference and its broadcast partners.

The Sept. 14 game at Clemson will kick off at noon and be nationally televised by ESPN, while the Sept. 21 home game with BYU will kick off at 3:30 p.m. and be regionally televised by ABC. Tech already has a Thursday night ESPN date with Maryland on Oct. 17, which has a 7:45 p.m. kickoff.

Tech also has given its Aug. 31 season-opening game with Vanderbilt a 6 p.m. kickoff at Bobby Dodd Stadium. It will not be televised.

Times for Tech's other football games will be announced 12 days prior to game day. For a complete schedule, visit www.ramblinwreck.com.

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designed to handle the volume of water that's flowing through them today. In dry weather, treatment plants ensure the water is disinfected. But when heavy rains overwhelm the system, untreated sewage can flow into area creeks, backing up into people's houses and lawns.

Making matters worse, the central core is Atlanta's most densely populated area with 106,400 residents, one quarter of the city's total. It's also the central business district, which means as the office towers swell with workers, the load on the sewers shoots up dramatically. Add to that the construction of additional buildings such as Technology Square, Atlantic Station and Centergy's mixed-use developments, and the problem rises precipitously.

The trick, according to the city's engineers, is coming up with a plan the city can afford while still meeting the 2007 deadline and angering as few residents as possible. While the majority of residents have told the city they want the city to separate all of the sewers, the short deadline and the city's current budget crunch make that impossible, according to Joe Basista, manager of the city's wastewater program.

Instead, the city's plan calls for separating only 27 percent of the combined sewers and building tunnels and treatment plants to temporarily store excess sewage until rains subside and it can be disinfected. Clough and the panel's job will be to review the city's plan both from an engineering and an economic perspective. A civil engineer by trade, Clough has had a great deal of experience with sewers and tunneling and even assisted the city of San Francisco in redesigning its stormwater sewage system.

"Our first task is to review the city's plan, and then assimilate information for well developed ideas that might represent alternatives to the plan," Clough told the committee.

Despite the gravity of their task, the panel must work quickly. In order for the city to meet the 2007 deadline, Clough must hand his committee's recommendations to the mayor by the end of September.

The issue is especially important to Clough and Georgia Tech because 2.4 miles of the combined sewers run under campus. Clough said he's even had sewage back-ups in his own back yard. He also said he's sensitive to the hassles that sewer construction can cause because six out of the eight years he's been on campus have been disrupted by sewer construction.

For more information...

City of Atlanta Department of Public Works
www.atlantapublicworks.org

IN BRIEF:

New computer training vendor means lower prices

The Office of Organizational Development (OOD) is reporting that beginning this month, prices for computer training offered through OOD have been rolled back due to a new **preferred vendor relationship with New Horizons for computer technical, internet, and applications training**. And as an added bonus, New Horizons offers training on Macintosh computers at its locations.

This can mean up to 50 percent savings for professional development. Computer training on campus for courses such as Word, Excel, Powerpoint and Access will cost $60 per day. At New Horizons locations, the departmental cost is $120 per day. Similar discounts are available for creative applications such as Dreamweaver and Photoshop and technical applications such as Novell or Microsoft technical certification training classes.

OOD's master training calendar – www.trainsweb.gatech.edu/mastcal.asp — shows all classes scheduled on campus from August through November.

OOD has also arranged special rates for a private department class either on campus or at New Horizons. For a group of ten or more, this may be the most cost-effective measure. To find out more about arranging a private class, contact Hal Irvin at hal.irvin@success.gatech.edu, or by phone at 894-1099.

Saving for college

The Office of Human Resources has announced that, effective fall semester, Georgia Tech faculty and staff will be able to make payroll deductions into the new **Georgia Higher Education Savings Plan 529**.

A 529 college savings plan is **a federally authorized savings account** that carries tax advantages for people using money for qualified higher education expenses. The plan offers advantages such as tax-free withdrawals, estate benefits, low expenses, a range of investment options, no annual contribution limits, professional management of the funds saved and enrollment through the Payroll Department.

This education savings plan requires a minimum initial contribution and employee contribution through payroll — an after-tax deduction from each pay. A brochure and enrollment forms are available at the Human Resources Benefits Office. For more information on Georgia's 529 Plan, call 877-424-4377 or visit www.GAcollegesavings.com.

Reclocation news

Accounts Payable has moved to the Ziegler Building at 711 Marietta Street. The office will maintain current phone and fax numbers, and faculty and staff should continue to use the 0253 mail code for sending approved invoices, Check Request Forms, Travel Expenses Statements, and other Accounts Payable documents. The Document Processing Team has also relocated to the Ziegler Building, and any emergency payment requests must be hand delivered to that team to ensure prompt handling.

Check pick-up between the hours of 9 a.m. and noon at the new address began July 10. The office does not anticipate interruption of service during the move, but say that urgent requests should be directed to ap.ask@business.gatech.edu or travel.ask@business.gatech.edu to ensure priority service. For additional information, contact Sharon Jackson at 894-0348 or sharon.jackson@business.gatech.edu.