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THE WHISTLE

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THE GEORGIA INSTITUTE OF TECHNOLOGY

Professor says U.S. risks losing edge in innovation

TJ Becker
 Research News

The global landscape for science and technology is changing, with increased competition for resources and recognition. That's beginning to look like bad news for the innovative edge the United States has long enjoyed.

"Will the United States own the technology of the future? Probably not all of it, and only if we compete harder to maintain our current position," said Diana Hicks, professor and chair of the School of Public Policy.

Many foreign governments have been strengthening their educational

and research programs, she explained. As a result, the gap is closing between the United States and its overseas competitors, with Asian countries — China, South Korea, Japan, Taiwan, Singapore and India — showing particular gains.

Hicks discussed trends in Asian research and development and their impact on United States education and industry at the American Chemical Society's national meeting earlier this month, presenting a number of benchmarks that raise concern for the United States.

Hicks continued, page 2

May to chair School of Electrical and Computer Engineering

Michael Hagearty
 Institute Communications
 and Public Affairs

College of Engineering Dean Don Giddens announced last week that Gary May, professor and executive assistant to the president, will be the new chair for the School of Electrical and Computer Engineering.

The School is one of Tech's largest, boasting more than 130 faculty members and 2,300 students at all degree levels. At the undergraduate level, students choose to major in either electrical or computer engineering. Last fall, U.S. News and World Report ranked Tech's programs as sixth and seventh in the nation, respectively. As chair, May will assume the duties of Roger Webb, who retired in December.

"I am very gratified by the confidence shown by Dean Don Giddens, the search committee and my colleagues in selecting me to lead the School of ECE," he said. "I am also humbled by the prospect of following in the footsteps of Roger Webb, who I very much admire and respect, but excited by the challenges and opportunities that this new appointment entails."



Gary May

Those opportunities, May added, will help enhance the School's profile.

"My immediate priorities are three-fold," he said. "I plan to be very involved in development activities to raise operational funds for the School, as well as to improve our facilities. I would like to find more mechanisms to tell our story of research innovation and educational leadership that I feel is very compelling. I also plan to work hard to enhance the diversity of ECE students and faculty."

May earned his bachelor's degree in electrical engineering from Tech in 1985, moving on to the University of California at Berkeley for his master's and doctoral degrees. He returned to Tech as an assistant professor in 1991 and accepted the Motorola Foundation Professorship in 2001.

In addition to his teaching and research career, May has gradually become more active as an administrator as well. For the past three years, May has served as executive assistant to the president, acting as President Clough's chief liaison both on and off campus.

May continued, page 3

Game theory



The School of Literature, Communication and Culture in Ivan Allen College of Liberal Arts celebrated the tenth anniversary of digital media degree programs at Georgia Tech with the Living Games World Symposium last week. The day-long symposium featured electronic gaming experts from industry and academia discussing issues such as the convergence of digital media technologies, future of entertainment, creativity and narrative and game worlds.

Will Wright, creator of popular video games such as "The Sims," provided the highlight of the day during his presentation, "Content, Compression and Creativity." Wright gave a demonstration of his newest, unreleased game, "Spore," which allows players to control the evolution of life, from a single cell organism to creating creatures to UFOs. Wright explained that his first games were equal parts data and code, but today that ratio is 100-to-1 — making compression technology crucial to performance.

"When doubling the content, we're not necessarily doubling the value to the player," said Wright. As a result, "Spore" will have half the code and content of "Sims 2," reversing a trend that was not sustainable.

Engineering and design on display at auto show

Meticulously restored classic and antique automobiles, hot rods, muscle cars, kit cars, customized trucks, motorcycles, race cars, and concept cars will gather again on the Georgia Tech campus for the 2nd Annual Georgia Tech Auto Show, to be held Saturday April 2.

The Georgia Tech community has made a dramatic impact on automotive technology and design over the

Auto continued, page 3



Cars of all stripes will compete in a variety of categories.

QUOTE
UNQUOTE

"They were deeply ambivalent about bigger government, but they viewed the government as an agent which could keep a level playing field."

—Robert McMath, professor in the School of History, Society and Technology, drawing a parallel between the populist ideology of the late 1800s and the defenders of the current Social Security system. (Miami Herald)

Sloan Foundation recognizes three faculty for research

David Terraso
Institute Communications
and Public Affairs

Three Georgia Tech faculty members have been named 2005 Alfred P. Sloan Research Fellows. This year, 116 fellows were selected from nominations of young American and Canadian faculty members in the sciences and economics. Tech's current crop of Sloan Fellows includes: Alex Kuzmich, assistant professor in the School of Physics, Todd Strelman, assistant professor in the School of Biology and Marcus Weck, assistant professor in the School of Chemistry and Biochemistry.

Each fellow at Tech will receive \$45,000 over a two-year period that can be used without restriction in research of the fellow's choice. The awards, established in 1955, are the oldest program of the Alfred P. Sloan Foundation and are designed to give support and recognition to early-career scientists and scholars.

Strelman, who is completing his first year at Tech, will use the award to supplement his study of the jaws and teeth of cichlid fish in Africa's Lake Malawi. Cichlid fish exhibit a trait known as phenotypic plasticity in their jaws whereby the same set of genes can result in widely different jaw types and sizes depending on the prey the fish eats. Fish who start out life eating prey that require crushing will develop strong jaws, while fish who eat more tender prey will have weaker jaws, even though the genes may be identical. As a result, cichlids exhibit tremendous diversity in the form and strength of their jaws. Strelman is studying the jaws to gain a more complete picture of how the genes and the environment result in different traits.

From left, Todd
Strelman, Alex
Kuzmich and
Marcus Weck



"We want to know the genes that control functional variation in the shapes of jaw and tooth skeletal elements," he said. In addition to looking at the jaws as a biological system, Strelman said they can be modeled as mechanical systems. "If we can measure the angles and components, we can treat them as if they were a synthetic material and ask how these models predict the force generated by the fish. The work has potential applications for mechanical as well as tissue engineering."

Kuzmich plans on using the award to develop long distance communications over quantum networks. Unlike traditional computer networks, which move information in bits of ones or zeros, quantum networks move information in quantum bits, which can be both ones and zeros at the same time. The upshot is that quantum computers may be able to do certain tasks — code breaking and simulations of quantum mechanics, for example — more quickly and more securely than conventional computers.

"In principle, classic communications networks are always insecure," explained Kuzmich. "With quantum communications, one cannot eavesdrop without being detected because the act of eavesdropping changes the states of the quantum bits. So it is always easy to see if someone is listening to what you are saying. This could have a big impact on commerce and government applications."

Weck will use the award to support his work in developing self-assembling, multifunctional raw materials. Weck explained that nature uses only a few building blocks to make a wide array of complex materials, such as DNA and proteins. His work involves trying to mimic nature's design motifs in making new materials.

"The amount of complexity you can get with these self-assembling motifs is potentially much higher than what you can get with covalent chemistry-based systems," said Weck.

Previous Sloan Fellows:

- 2003: Saugata Basu (School of Mathematics)
- 2002: Andrew Lyon and Z. John Zhang (School of Chemistry and Biochemistry)
- 2001: Robert Dickson (School of Chemistry and Biochemistry), Elizabeth Mynatt and Dana Randall (College of Computing)
- 2000: Rigoberto Hernandez (School of Chemistry and Biochemistry)

Hicks, cont'd from page 1

• **Talent pool:** The number of researchers in Asia has grown rapidly as more Asians, especially the Chinese, earn doctoral degrees. At the same time, the number of United States citizens pursuing doctoral degrees has been decreasing.

In addition, the number of Asian students who study for doctoral degrees in the United States dropped 19 percent in just four years, 1994 to 1998. That's disturbing because those students had helped make up for the dearth of U.S.-born students enrolled in science and engineering, Hicks explained. Foreign students often remain in the United States for research jobs, contributing to the nation's knowledge base.

• **R&D spending:** From 1995 through 2001, China, South Korea and Taiwan increased gross research and development (R&D) spending by about 140 percent, while the United States increased its investments by only 34 percent.

Another disturbing signpost: 68

percent of all domestic R&D money in the United States now comes from the private sector. Nearly three-fourths of this money goes toward development instead of basic research, in which researchers try to gain greater knowledge of a subject without specific applications in mind.

"Basic research is important because it sets up the country for the next generation of technology so we don't run out of innovations," Hicks said. "Funding basic research is the role of the public sector, and yet federal spending for basic research in engineering and the physical sciences has shown little or no growth in the last 30 years."

• **Patent growth:** Since 1988, the number of U.S. patent applications for innovations originating in Asia increased 789 percent, with South Korea evidencing especially strong gains. In contrast, U.S. patent applications for homegrown technology grew more slowly at a rate of 116 percent.

• **Published papers:** The United States' share of science and engineering papers published worldwide fell from 38 percent in 1988 to 31

percent in 2001, while European and Asian papers have been on the upswing. Although scientific papers don't always have immediate commercial applications, they remain an important measure of our knowledge base, Hicks said. "It's a sign that you have highly skilled people who are producing the necessary knowledge for later applications."

A member of the Task Force on the Future of American Innovation, Hicks spoke recently in Washington, D.C., where the coalition of business and academic leaders called for increased federal spending for basic research. She will make another presentation next month at the annual Engineering R&D Symposium.

"In contrast to natural disasters like the recent tsunami, this is a slow-developing trend, and one that's hard to see from inside the United States," Hicks said. "We're still a very competitive country, but it's important to look at the long-range implications of these benchmarks. Maintaining our leadership role in science and innovation is critical to economic strength and national security."

Georgia
Tech



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Howard wins third national title in high jump

Scott MacDonald
Athletic Association

For 21 collegiate competitions over a period of nearly two years, Chaunte Howard has been unbeatable. Earlier this month, the junior economics major claimed her third national title at the 2005 Indoor NCAA Championships in Arkansas.

"It means a lot to me," said Howard on defending her indoor national title. "I had to work for it. It's harder once you're on top because everybody is chasing you and it's easier to fall."

It was the latest achievement in what has been a remarkable 12 months. Last summer, Howard set a new outdoor school record at the BYU Invitational with a mark of 6-6, winning a competition filled with professional athletes and some of the world's top high jumpers.

Howard used that confidence to qualify for the 2004 Athens Olympics. The Riverside, Calif., native finished second at the U.S. Olympic Trials in Sacramento.



Photo by Rob Skinner

"It was great to be able to do that in front of my friends and family," said Howard.

At the Olympics, Howard finished in a tie for 28th place. "I didn't do as well as I would've liked, but it was a good learning experience," she said. Howard will be seeking her fourth straight national title — and second straight outdoor NCAA crown — at the Outdoor NCAA Championships in June.

May, cont'd from page 1

May has also been intimately involved in developing programs aimed at increasing the number of minority students who pursue advanced degrees. Two such programs — the Summer Undergraduate Research in Engineering/Science (SURE) and Facilitating Academic Careers in Engineering and Science (FACES) — have secured more than \$11 million from the National Science Foundation.

Giddens said the breadth of his leadership experience made him the ideal choice.

"In his professional life, Gary May has demonstrated insight and commitment. Not only has he amassed an impressive research and teaching record, but also he has dedicated himself to mentor and encourage students to earn advanced degrees and pursue careers in academia. Moreover, he has tirelessly represented his School, College and Institute with good humor and class. With thanks to the search committee for its effort, we are privileged to have Gary serve as the new chair of ECE."

May said his new role will demand a shift in priorities, but will not alter his interests.

"I plan to continue to pursue my own research, albeit at a somewhat reduced level," he said. "After all, leading the ECE community will require the bulk of my time and attention. I also plan to

stay involved in diversity programs like SURE and FACES, but hope to find colleagues willing to share the leadership responsibilities of those important activities."

May underscored that it was the support of others who have played key roles in his success.

"I would like to gratefully acknowledge three people: Roger Webb and Wayne Clough, who have been the two best bosses and professional mentors one could ever hope to have; and my wife LeShelle, who is a more understanding and supportive spouse than I probably deserve."

President Clough thanked May for his service and counsel as his executive assistant, and congratulated him on his new appointment.

"Gary has proven himself to be an outstanding mentor, a first-rate researcher and an excellent member of my staff," he said. "While we will miss his daily presence in Carnegie, his leadership of ECE will be exceedingly important for the future of the College of Engineering and Georgia Tech. I'm very proud of his accomplishments on behalf of the President's Office and know that his best days are ahead. We're very fortunate to have someone of Gary's caliber follow in the sizeable footsteps of Roger Webb."

In the coming months, President Clough will appoint May's successor as executive assistant, initiating the transition process and the transfer of duties. It is hoped that he will fully assume his new role by the end of the semester.

Auto, cont'd from page 1

past 100 years, and this show will underscore the work of certain former students who have changed automotive design during their careers at General Motors, Ford, Mazda and Ferrari.

Organizers are inviting all members of the Tech community to show off their automobile or motorcycle. "If you don't have a vehicle, just bring your passion and your camera," said Sterling Skinner, director of instructional laboratories at the School of Mechanical Engineering. "This event's purpose is to bring together the students, faculty, staff, alumni and corporate sponsors who are automotive enthusiasts."



Some vehicles will be very rare classics, but any vehicle that is appreciated by its owner is welcome. There is no entry fee to display a vehicle, and prizes will be given out for several categories.

The event is sponsored by the School of Mechanical Engineering and the Industrial Design Program in the College of Architecture.

A registration Web site explaining more details is now online.

For more information...

Georgia Tech Auto Show
www.me.gatech.edu/autoshow

IN BRIEF:

Outside funding to USG institutions at all-time high

The University System of Georgia's income for extramural funding has set another record, reaching \$980.7 million during the past fiscal year. The numbers, released in a report earlier this month to the Board of Regents, represent a 14 percent increase over the previous year's total of \$861 million. Extramural funding includes grants and contracts for research, public service and instruction.

Of the total, \$651.6 million was for research, \$235 million was for public service, and \$94 million was for instruction. In fiscal year 2004, funding for research alone jumped 22.3 percent over fiscal year 2003. The report, prepared by the Regents' Office of Strategic Research and Analysis, shows that 71.6 percent of the System's research income came from federal sources, while 4.2 percent came from the state of Georgia. The non-profit sector accounted for 8.6 percent of the total, with business contributing 8.6 percent. Other sources combined for the remaining 7 percent.

The report also details technology transfer and license and equity income in the University System. In 2004, there were 420 research disclosures in the University System, 185 patents filed, 137 licenses approved and 18 start-up companies.

FASET looking for leaders

FASET is currently recruiting for the 2005 Orientation Leader staff. Applications are available online at www.faset.gatech.edu. Applications are due no later than Wednesday, March 30 in room 105 of the ESM Building.

It is hoped that faculty and staff will encourage students to apply. You may also e-mail Josh Mallett at gtg695g@mail.gatech.edu with suggestions or recommendations.

Earth Day Leadership Award

Georgia Tech's Earth Day committee is accepting nominations for its annual Environmental Leadership Award, recognizing a member of the campus community who has made a positive environmental impact on the Georgia Tech campus. The winner will be announced at the Earth Day celebration, to be held on April 22 from 10 a.m. – 2 p.m. along the Skiles Walkway.

Eligible candidates must be affiliated with Georgia Tech as a current student, faculty or staff member or alumnus. Retired faculty and staff will also be considered.

Nominations must be received by April 8. For more information, visit

www.earthday.gatech.edu/leadership.html.

Register for summer camp

The Campus Recreation Center is planning for another summer of teCh wReCk day camp for children ages 6 to 12 years old. A complete list of activities and registration information is available at www.crc.gatech.edu/SummerCamp.

The CRC is also looking for camp counselors. Contact April Goode at 894-1311 or e-mail april.goode@crc.gatech.edu.

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

Arts & Culture

Apr. 1

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

Apr. 7

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

Apr. 9

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

Brown Bags/Conferences/Lectures

Mar. 22-23

Georgia Tech's Packaging Research Center hosts The Second International Workshop on Nano- and Bio-Electronics Packaging in the Technology Square Research Building. For program details and registration, visit www.prc.gatech.edu/nanobiopack.

Mar. 28

The Center for the Enhancement of Teaching and Learning (CETL) recognizes innovative teaching at Celebrating Teaching Day from 10 a.m. - 2 p.m. in the Library's main entrance and West Commons. The event will feature poster presentations from senior and junior faculty as well as student's who teach at metro Atlanta high schools as part of the

Student and Teacher Enhancement Program (STEP).

Mar. 29

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

Mar. 29

The Materials Council's seminar series welcomes Martin Harmer, director of the Center for Advanced Materials and Nanotechnology at Lehigh University, on "Mechanisms of Single Crystal Conversion of Alumina Ceramics," at 3 p.m. in room 183, Love Building.

Mar. 29

The Office of Organizational Development hosts a lunchtime brown bag "From 200 BC to Modern Times: The Art, Science and History of Papermaking," in room 308, Savant Building. To register, visit www.trainsweb.gatech.edu.

Mar. 30

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

Mar. 30

The School of Psychology's spring colloquium series welcomes Nancy Cooke, professor of applied psychology at Arizona State University, on "Emergent Team Cognition (or What Was Wrong

with the U.S. Olympic Basketball Team?)" at 3 p.m. in the J.S. Coon Building.

Mar. 30

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

Mar. 30

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

Mar. 31

The School of Mechanical Engineering's Woodruff Colloquia Series welcomes UCLA Professor Vijay Dhir on "Nucleate Boiling In Reduced Gravity: Numerical Simulations and Experiments," at 3 p.m. in the MaRC Auditorium.

Mar. 31

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

Miscellaneous

Ongoing

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

C L A S S I F I E D S

APPLIANCES

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

AUTOMOBILES

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

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

2001 Toyota Sienna LE minivan. Champagne, seven-passenger, captain's chairs, tape/CD player, dual climate, remote entry, 71K miles. \$12,500. Extended warranty through Sept. 2005. Call 770-365-6445 or e-mail hope4u2@bellsouth.net.

2002 Chevrolet S-10 extended cab. One owner. White with dark gray interior, ABS, V6 4300 Vortec, sport suspension, tinted windows, tow package, Rhino bed liner, 15K miles, \$11,500. Call 770-241-3151.

FURNITURE

3-piece entertainment center, white-washed pine finish, lighted glass shelves, holds up to 32-inch TV and other components. \$400 OBO. Pictures available. E-mail debbie.winn@gtri.gatech.edu.

Wooden captain bunk bed. Has two beds with built-in chest of drawers and built-in desk. Ladder to top unit. Less than one year old. Paid over \$900, sell for \$300. Call 894-5675.

Four bar stools. High back, padded seat and lumbar. Full swivel. Mint condition. \$80 each OBO. Call Phyllis at 385-1109.

Light blue padded rocker with padded rocker ottoman with light oak wood frame. Paid \$150, sell for \$40. E-mail jeanette.collins@gtri.gatech.edu or call 404 894 9245.

REAL ESTATE/ROOMMATES

Approx. one-acre lot at Lake Jackson in Turtle Cove (Eagle Lot 10). Direct common property access to the lake, underground utilities. 2005 taxes and fees paid. \$15,500. E-mail dennis.kelly@edi.gatech.edu or call 478-825-5504.

Two-year old 2BR/2BA townhome. Great location in Riverdale, 5 minutes from the airport. Oversized bedrooms

and closets. Swim/tennis and yard maintained by homeowners association. \$800/month. Call 678-556-9262.

2BR/1.5 BA brick townhouse. Complete renovation in 2000, including new appliances. 2 blocks to Smyrna Village Green, 30 minutes to GT. Asking \$132,000. E-mail eileen-gram@juno.com or call 894-0065.

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

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

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

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

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

SPORTS/FITNESS/RECREATION

Tuff Stuff Muscle 3 all-in-one gym. Top of the line. Like new, kept in finished basement. Paid \$1,200, reduced to \$250 OBO. Call 894-8392 or e-mail bob.lang@police.gatech.edu.

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

MISCELLANEOUS

1999 Play-mor Deluxe camper. 38-foot fifth wheel model, self-contained with water and waste tanks. \$29,500 OBO. E-mail t.banks@mse.gatech.edu or call 894-6763.

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

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