

Inside:

Library's ACRL award . . . . .	2
Faculty/staff honors . . . . .	3
25-year employees . . . . .	3
Campus Events . . . . .	4



# THE WHISTLE

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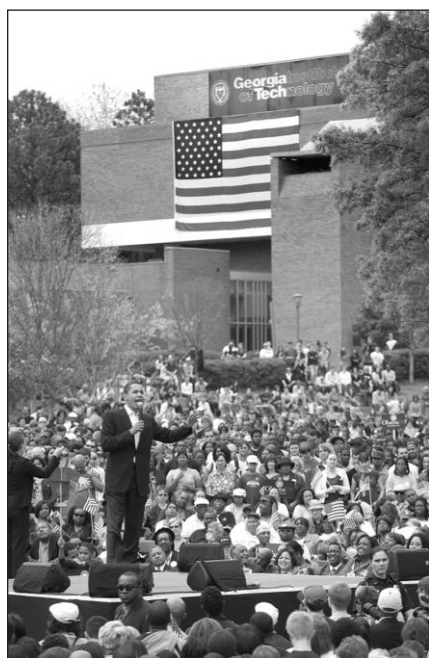
THE GEORGIA INSTITUTE OF TECHNOLOGY

## El-Sayed takes top faculty honor



Regents' Professor Mostafa El-Sayed sits with his commemorative plaque after being named as recipient of the Georgia Tech Class of 1934 Distinguished Professor Award, the Institute's highest faculty honor, during the annual Faculty/Staff Awards Luncheon. El-Sayed, a member of the School of Chemistry and Biochemistry and director of the Laser Dynamics Laboratory, was one of many in the campus community who were recognized for their dedication to Georgia Tech. For a complete list of the awardees, see page 3.

## Visit from presidential candidate draws large crowd to campus



School of Public Policy undergraduate Jessie Brenton (right) is seen rallying the crowd in support of Democratic presidential candidate Barack Obama, who visited the Georgia Tech campus on Saturday, April 14 at the invitation of two student organizations: the African American Student Union and the College Democrats at Georgia Tech. During his 20-minute appeal, the Illinois senator shared some personal history, issued a call for unity and offered a vision for a country under his leadership.

The crowd gathered in the large green space next to Skiles Walkway, but eventually stretched from the Student Center (shown at left) to the parking lots adjacent to the Library. A member of the Georgia Tech Facilities Fire Safety Office estimated there were 20,000 people in attendance.

## Nanogenerator prototype provides continuous electrical power

*Drawing energy from the environment to provide direct current*

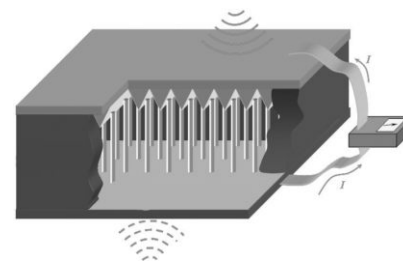
John Toon  
Research News

Researchers have demonstrated a prototype nanometer-scale generator that produces continuous direct-current electricity by harvesting mechanical energy from such environmental sources as ultrasonic waves, mechanical vibration or blood flow.

Based on arrays of vertically aligned zinc oxide nanowires that move inside a novel "zig-zag" plate electrode, these nanogenerators could provide a new way to supply power without batteries or other external power sources.

"This is a major step toward a portable, adaptable and cost-effective technology for powering nanoscale devices," said Zhong Lin Wang, Regents' professor in the School of Materials Science and Engineering. "There has been a lot of interest in making nanodevices, but we have tended not to think about how to power them. Our nanogenerator allows us to harvest or recycle energy from many sources to power these devices."

Details of the nanogenerator were reported in the April 6 issue of the



The above schematic shows the direct current nanogenerator, using aligned nanowire arrays made of zinc oxide with a zig-zag top electrode. The nanogenerator is driven by an external ultrasonic wave or mechanical vibration, causing the wires to flex and transfer electrical charges to the electrode.

journal Science.

The nanogenerators take advantage of the unique properties of zinc oxide nanostructures, which produce small electrical charges when they are flexed.

Fabrication begins with growing an array of vertically aligned nanowires approximately a half-micron apart. The researchers also fabricate silicon "zig-zag" electrodes, which contain thousands of nanometer-scale tips made conductive by a platinum coating. Moved by mechanical energy such as waves or vibration, the

*Nanogenerator continued, page 2*





## QUOTE UNQUOTE

"It's feasible, for sure. It's just, how much do you want to spend? The quandary utilities in the Southeast are in is people want low rates and won't pay more for renewable energy. I believe in renewables, but in some cases there have to be draconian measures taken [before they will be used]."

—William Bulpitt, a senior research engineer in Georgia Tech's Strategic Energy Institute, who recently took part in a feasibility study of wind power off the Georgia coast. (Charleston Post & Courier)

Nanogenerator cont'd from page 1

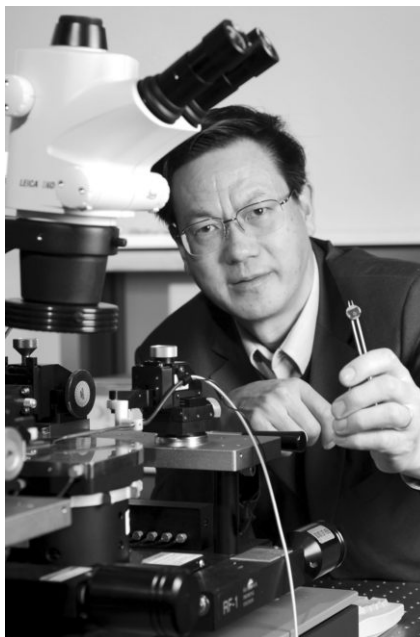
nanowires periodically contact the tips, transferring their electrical charges.

Wang and his group members expect that with optimization, their nanogenerator could produce as much as four watts per cubic centimeter. That would be enough to power a broad range of applications, including biosensors implanted in the body, environmental monitors and nanoscale robots.

"Producing the top electrode as a single assembly sets the stage for scaling up this technology," Wang said. "We can now see the steps involved in moving forward to a device that can power real nanometer-scale applications."

Before that happens, additional development will be needed to optimize current production. For instance, though nanowires in the arrays can be grown to approximately the same length — about one micron — there is some variation. Wires that are too short cannot touch the electrode to produce current, while wires that are too long cannot flex to produce electrical charge.

"We need to be able to better



Regents' Professor Zhong Lin Wang holds a prototype nanogenerator fabricated using an array of zinc oxide nanowires.

control the growth, density and uniformity of the wires," Wang said. "We believe we can make as many as millions or even billions of nanowires produce current simultaneously. That will allow us to optimize operation of

the nanogenerator."

Providing power for nanometer-scale devices has been a challenge. Batteries and other traditional sources are too large, negating the size advantages of nanodevices. And since batteries contain toxic materials such as lithium and cadmium, they cannot be implanted in the body as part of biomedical applications.

Because zinc oxide is non-toxic and compatible with the body, the new nanogenerators could be integrated into implantable biomedical devices to wirelessly measure blood flow and blood pressure within the body. And they could also find more ordinary applications.

"If you had a device like this in your shoes when you walked, you would be able to generate your own small current to power small electronics," Wang noted. "Anything that makes the nanowires move within the generator can be used for generating power. Very little force is required to move them."

For more information...

**Center for Nanoscience and Nanotechnology**

[www.nanoscience.gatech.edu/zlwang](http://www.nanoscience.gatech.edu/zlwang)

**Georgia Tech**



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## Library recognized with national award for excellence



Richard Meyer, dean and director of the Georgia Tech Library and Information Center, directed a celebration honoring its selection for the Association of College and Research Libraries (ACRL) 2007 Excellence in Academic Libraries Award. In its citation, the ACRL commended Tech for its commitment to developing a stimulating and



engaging physical environment and making imaginative use of public spaces.

ACRL President Pamela Snelson (right) complimented Georgia Tech for creating an aesthetically pleasing learning commons that had become "the heart and soul of the community."

## Online parking registration open

Beginning this week, Georgia Tech employees may apply for a 12-month campus parking permit, renew their current lot or change lots. And, as in year's past, the Office of Parking and Transportation will stage the entire process online.

Employees receive a confirmation e-mail after successfully completing the online registration process. Unsuccessful attempts will receive an e-mail notification with instructions for completing the process. Permits will be mailed in July.

While the preferred payment option

for eligible employees is pre-tax payroll deduction, those choosing to pay via check or credit card will receive an invoice by e-mail.

Most questions regarding policies are available at [www.parking.gatech.edu](http://www.parking.gatech.edu). Employees may also send an e-mail to [register@parking.gatech.edu](mailto:register@parking.gatech.edu). For permit registration, visit [www.applyparking.gatech.edu](http://www.applyparking.gatech.edu).

Last week's **Faculty/Staff Honors Luncheon** offered an opportunity to recognize not only the award winners listed below, but also 189 members of the Tech community who marked their 10-year anniversary, and another 66 (listed at right) who reached the 25-year mark. The Whistle extends its congratulations to the honorees.

**2006 Staff Tuition Reimbursement Assistance Program (STRAP) graduates**  
**Wanda M. Budaj**, Auxiliary Services  
**D. Gayle Burt**, Chemical and Biomolecular Engineering  
**Reginald E. Chambers**, Organizational Development  
**Lakita J. Cordova**, Sponsored Programs  
**Michelle L. Graham**, Management  
**Marcus A. Johnson**, Computing  
**Shirley Manchester**, Materials Science and Engineering  
**Cheryl A. Parker**, Library and Information Systems  
**Beverly A. Paul**, Economics  
**Cornelius Rouse**, Grants and Contracts Accounting  
**N. Carolyn Schneider**, Student Financial Planning and Services  
**Maria L. Suarez**, International Affairs

**Don Bratcher Human Relations Award**  
**Gregory D. Abowd**, associate professor, Interactive Computing

**Administrative Service Award**  
**Steve G. Head**, senior project director, Budget Office

**Georgia Tech Chapter Sigma Xi Awards**  
**YOUNG FACULTY AWARDS**  
**Athanasios Nenes**, assistant professor, Chemical and Biomolecular Engineering, and Earth and Atmospheric Sciences  
**Soojin Yi**, assistant professor, Biology  
**FACULTY BEST PAPER AWARDS**  
**Laurence J. Jacobs**, professor, Civil and Environmental Engineering  
**Jin-Yeon Kim**, research scientist, Civil and Environmental Engineering  
**Kirill S. Lobachev**, assistant professor, Biology  
**Jianmin Qu**, professor, Mechanical Engineering  
**SUSTAINED RESEARCH AWARD**  
**Charles Ume**, professor, Mechanical Engineering

**Faculty Research Awards**  
**OUTSTANDING DOCTORAL THESIS ADVISOR**  
**Armistead (Ted) Russell**, professor, Civil and Environmental Engineering  
**OUTSTANDING ACHIEVEMENT IN RESEARCH PROGRAM DEVELOPMENT**  
**Ajeet Rohatgi**, Regents' professor, Electrical and Computer Engineering  
**OUTSTANDING FACULTY RESEARCH AUTHOR**  
**Joy Laskar**, professor, Electrical and Computer Engineering  
**Peter J. Webster**, professor, Civil and Environmental Engineering  
**OUTSTANDING FACULTY LEADERSHIP FOR THE DEVELOPMENT OF GRADUATE RESEARCH ASSISTANTS**  
**John D. Cressler**, professor, Electrical and Computer Engineering

**ANAK Award**  
**Reginald DesRoches**, associate professor, Civil and Environmental Engineering

**Outstanding Staff Performance Awards**  
**Harry L. Beck**, director of operations, Electrical and Computer Engineering  
**Jewel P. Coleman**, department manager, Information Technology  
**Keith Garner**, facilities manager, Physics

**Greg B. Goolsby**, director, Facilities and Capital Planning, College of Engineering  
**William E. Gregory**, manager, Security Operations, Georgia Tech Research Institute  
**Glen R. Hickman**, technical project director, Information Technology

**CETL/BP Junior Faculty Teaching Excellence Award**  
**Matthew H. Baker**, assistant professor, Mathematics  
**Jaehong Kim**, assistant professor, Civil and Environmental Engineering  
**Chris Paredis**, assistant professor, Mechanical Engineering

**Education Partnership Award — Faculty**  
**Kim M. Cobb**, assistant professor, Earth and Atmospheric Sciences

**Education Partnership Award — Student**  
**Kathleen R. Salome**, undergraduate student, Earth and Atmospheric Sciences

**Education Partnership Award — K-12**  
**Christy Hodges**, science teacher, Miller Grove High School  
**Solona Hollis**, science teacher, Miller Grove High School

**Academic Advisor Awards Committee**  
**OUTSTANDING UNDERGRADUATE ACADEMIC ADVISING — STAFF**  
**Valarie R. DuRant-Modeste**, academic advisor, Industrial and Systems Engineering  
**OUTSTANDING UNDERGRADUATE ACADEMIC ADVISING — FACULTY**  
**Kristi Mehaffey**, academic professional, Mechanical Engineering

**Faculty Honors Committee Awards**  
**CLASS OF 1940 W. ROANE BEARD OUTSTANDING TEACHER AWARD**  
**John A. Buck**, professor, Electrical and Computer Engineering  
**CLASS OF 1940 W. HOWARD ECTOR OUTSTANDING TEACHER AWARD**  
**Gregory D. Durgin**, assistant professor, Electrical and Computer Engineering  
**OUTSTANDING SERVICE AWARD**  
**James H. McClellan**, professor, Electrical and Computer Engineering  
**OUTSTANDING PROFESSIONAL EDUCATION AWARD**  
**Bruno Frazier**, associate professor, Electrical and Computer Engineering

**OUTSTANDING UNDERGRADUATE RESEARCH MENTOR (FACULTY) AWARD**  
**Lawrence A. Bottomley**, professor, Chemistry and Biochemistry  
**Mark R. Prausnitz**, professor, Chemical and Biomolecular Engineering

**CLASS OF 1934 OUTSTANDING INNOVATIVE USE OF EDUCATION TECHNOLOGY AWARD**  
**Thomas Morley**, professor, Mathematics

**CLASS OF 1934 OUTSTANDING INTERDISCIPLINARY ACTIVITY AWARD**  
**Berdinus A. Bras**, professor, Mechanical Engineering

**CLASS OF 1934 DISTINGUISHED PROFESSOR AWARD**  
**Mostafa A. El-Sayed**, Regents' professor, Chemistry and Biochemistry

# 25-year anniversaries



**Judith W. Alexander**  
Ivan Allen College  
**Jane C. Ammons**  
Engineering  
**Rita M. Anderson**  
Earth and Atmospheric Sciences  
**Thomas O. Autrey**  
Georgia Tech Research Institute  
**Robert W. Baggerman**  
Georgia Tech Research Institute  
**Randy Beasley**  
Facilities  
**W. J. Blane**  
Architecture  
**L. Rena Brakebill**  
Mathematics  
**Joseph L. Brooks**  
Georgia Tech Research Institute  
**John A. Buck**  
Electrical and Computer Engineering  
**W. Brent Carter**  
Materials Science and Engineering  
**Vivian T. Chandler**  
GVU Center  
**Mark A. Clements**  
Electrical and Computer Engineering  
**Charles L. Cleveland**  
Physics  
**Darius A. Cobbs**  
Library  
**William Curbow**  
Facilities  
**Wayne Daley**  
Georgia Tech Research Institute  
**Cathy L. Dunnahoo**  
Computing  
**Dennis Folds**  
Georgia Tech Research Institute  
**Jeff P. Garmon**  
Georgia Tech Research Institute  
**Queen E. Gordon**  
Enterprise Innovation Institute  
**T. Govindaraj**  
Industrial and Systems Engineering  
**John N. Grovenstein**  
Human Resources  
**Johncie A. Harbert**  
Georgia Tech Research Institute  
**Valeria D. Henderson**  
Accounting Services  
**David R. Hendrix**  
Sponsored Programs  
**John C. Holcombe**  
Capital Planning and Space Management  
**Jeffery A. Jenkins**  
Georgia Tech Research Institute  
**Roozbeh Kangari**  
Architecture  
**William E. Kenyon Jr.**  
Georgia Tech Research Institute  
**Robert R. Kerr**  
Georgia Tech Research Institute  
**Maureen Kilroy**  
Provost's Office - Academic Affairs  
**Diane W. Knobloch**  
Georgia Tech Research Institute

**Narayanan M. Komerath**  
Aerospace Engineering  
**Michael T. Kopp**  
Georgia Tech Research Institute  
**Thomas Lamb**  
Post Office  
**Darrell R. Lamm**  
Georgia Tech Research Institute  
**Ralph L. Latham Jr.**  
Aerospace Engineering  
**Thomas A. Moore**  
Georgia Tech Research Institute  
**John H. Myers**  
Enterprise Innovation Institute  
**Virginia L. Myers**  
Georgia Tech Research Institute  
**Janet M. Myrick**  
Electrical and Computer Engineering  
**John K. Ng**  
Information Technology  
**Jeffrey W. Payne**  
Facilities  
**Steven Payton Jr.**  
Facilities  
**E. Michael Perdue**  
Earth and Atmospheric Sciences  
**Frank M. Pickens**  
Student Health Services  
**Ronald J. Prado**  
Georgia Tech Research Institute  
**J. V. R. Prasad**  
Aerospace Engineering  
**Paul F. Pritchett**  
Georgia Tech Research Institute  
**Jacob M. Rhodes III**  
Georgia Tech Research Institute  
**Grover L. Richardson Jr.**  
Georgia Tech Research Institute  
**James G. Ross**  
Georgia Tech Research Institute  
**Lakshmi N. Sankar**  
Aerospace Engineering  
**Arnold Schneider**  
Management  
**Deborah Smith**  
Enrollment Services  
**James O. Smith**  
Georgia Tech Research Institute  
**Henry Spinks**  
Controller's Office  
**Paul G. Steffes**  
Electrical and Computer Engineering  
**Harry T. Sullivan**  
Electrical and Computer Engineering  
**Sandra C. Sullivan**  
Georgia Tech Research Institute  
**Vincent Sylvester**  
Georgia Tech Research Institute  
**George Vachtsevanos**  
Electrical and Computer Engineering  
**Albert M. Vineyard**  
Georgia Tech Research Institute  
**Michael L. Witten**  
Georgia Tech Research Institute  
**Patrick M. Wypasek**  
Security and Police Department