Introduction to Georgia Tech

President G. Wayne Clough

Wal-Mart President’s Roundtable
October 4, 2006
Georgia Tech: Recognized for excellence

- Among top 10 public universities in the nation.
- Among top 5 engineering schools in the nation.
- Nationally ranked for computing, architecture, management, and selected science and liberal arts programs.
- Caliber of incoming students among nation’s top 5 public universities.
Georgia Tech vision and mission

Georgia Tech will define the technological research university of the 21st century and educate the leaders of a technologically driven world.
Five campuses on three continents

Georgia Tech Atlanta
Georgia Tech Savannah
Georgia Tech Lorraine
Georgia Tech Singapore
Georgia Tech Ireland
Faculty

- 962 academic faculty
- 961 research faculty
- 208 post-doctoral fellows
- 117 endowed chairs and professorships
- 30 National Academy members
- 109 NSF CAREER Awards (2nd highest in the nation)
- 7 PECASE Awards (among top 10)
Students

17,933 students enrolled:

- 12,357 under-graduates
- 5,576 graduate students

Growing enrollment: added 4,150 students in the past 10 years.

A national leader in graduating minority engineers

Minority Issues in Higher Education
Hispanic Business
Reinventing undergraduate education

- Enriched admissions process
- Study abroad: 34%
- Research: 43%
- Music: 10% at any given time
- Leadership: new certificate program
- Diversity
A quality campus

4 million gross sq ft of new, renovated space
Marcus Nanotechnology Building

- Largest in the South
- Three classes of cleanrooms (10, 100, 1,000)
- First in nation, world designed for both physical, biomedical research
- Flexible configuration
- Multi-user access
- Interdisciplinary
Annual research expenditures
(in millions)
At the leading edge

- Research expenditures doubled during past decade
- Georgia Tech ranks second in the nation in engineering R&D
- One of 7 National Centers of Cancer Nanotechnology Excellence ($20 million)
- Recently attracted Jeff Skolnik, world-renowned computational biologist, and team of 20 to Institute for Systems Biology

Identifying and attacking individual cancer cells.

“The Razor” at the Institute for Systems Biology is the world’s 41st fastest computer.
18 National Centers of Excellence

- Microelectronics Packaging Research Center
- Center for Organic Photonics & Electronics
- Center for the Engineering of Living Tissues
- Mid-America Earthquake Center
- Center for Environmentally Responsible Solvents and Processes
Growing research thrusts

- Energy
- Predictive medicine
- Systems biology
- Electronic health systems
Growing research thrusts

- Disasters, water
- High performance computing
- Robotics
- Music technology
Expanding economic impact

- From 1995 to 2005, Georgia Tech spun off 76 new companies.
- In 2005, Tech was awarded 43 patents, 9th among research universities nationwide.
Tech has the “right stuff”

“What the Georgia Tech model recognizes is that the world is increasingly going to be operating off of the flat-world platform, with its tools for all kinds of horizontal collaboration.”

Thomas L. Friedman
*The World is Flat*
Sustainability is a culture at Georgia Tech

The Institute for Sustainable Technology and Development is an advocate for sustainability in the curriculum, research, and management of campus operations.
Permeating the educational experience with sustainability

- More than 100 courses have a sustainability perspective built in.
- Special student projects:
  - Constructing an 800-square-foot solar home for an international competition
  - FUTURE (FUrthering Technology’s Unity and Relationship with the Environment) coordinates student sustainability activities
Solar energy

University Center of Excellence in Photovoltaics Research and Education

Nuclear energy

- Nuclear fusion as future power source
- New materials for rigors of producing nuclear energy, shielding radiation sources
Combustion Laboratory

- Flameless combustion
- Increasing efficiency and productivity, lowering emissions
- Leader of NASA university research consortium on combustion

NEETRAC: National Electric Energy Testing Research and Applications Center

- Leading edge R&D; state-of-the-art testing
- Developing standards
- Technology transfer
- High-level education programs
Fuel cell and battery technologies

- Low-emission vehicles
- Wireless telecommunications
- Distributed stationary power supplies

Center for Organic Photonics and Electronics

- National Center of Excellence
- Develops new materials
- Manipulates photons in light in ways similar to electrons
Strategic Energy Initiative

- Energy technology development, assessment, demonstrations
- Policy guidance based on scientific facts, engineering principles, and economic realities
- Southern Pine to Ethanol initiative
- $12 million partnership with Chevron: biofuels and hydrogen
Linkage to industry

Sustainability and Solid State Lighting for Walmart

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Reducing waste

Presidential Green Chemistry Challenge Award

National Center of Excellence for Environmentally Responsible Solvents and Processes

- Solvents that are reusable or can be reconfigured to do multiple steps in a process
- Nanoparticles that allow multiple reactions in the same vessel

- “Closed loop” manufacturing to recover and reuse product components
- Recycling carpet and textile wastes
- Campus-wide recycling of paper, glass, plastic, aluminum
Industrial and systems engineering

- Georgia Tech has ranked first in the U.S. for 16 straight years
- The Logistics Institute in Atlanta
- The Logistics Institute – Asia Pacific in Singapore
- Transportation research: efficiency, logistics, security
- Keck Virtual Factory Lab: modeling integrated factory systems to increase efficiency
Global water needs

Mapping water lines in Honduras

Managing the Nile River

Building solar-powered latrines in Bolivia

Improving water quality in Angola
Improving air quality

Studying the effects of haze on food production

Gathering data to develop forecasting models for “air sheds”

The Georgia Tech Air Resources Engineering Center coordinates research; provides outreach, information and technology transfer.

Research in the Antarctic
Planning smart growth

Professor Adjo Amekudzi: Georgia Guidebook to Pedestrian Planning

SMARTRAQ: Studying how urban growth patterns affect quality of life

Students win international sustainable design competition to revitalize historic downtown Dubai

Planning for sustainable growth in Ecuador
Operating a sustainable campus

LEED Silver criteria form the construction standard

Natural gas powered trolleys

White roofs reflect summer heat

Rooftop drainage systems capture rainwater for irrigation
The Eco-Commons