

A series of teal-colored lines radiate from the top right corner of the page, extending towards the bottom left. The lines vary in thickness and angle, creating a dynamic, energetic pattern against the black background.

Research

**Georgia
Tech's
Engineering
Experiment
Station**

GEORGIA TECH'S ENGINEERING EXPERIMENT STATION

The Engineering Experiment Station (EES) of the Georgia Institute of Technology is an applied research organization that performs investigations in engineering, science, computer technology, and economic development for a diversity of sponsors, including federal, state and local governmental agencies, industrial firms, and foreign countries.

EES is chartered by the Georgia legislature as a non-profit, client-oriented organization. Its purpose is to serve the community, state and nation. EES conducts scientific, engineering and industrial research; encourages the development of the natural resources of Georgia; aids industrial and economic development; encourages productivity improvement in Georgia business and industry; and participates in national programs of science, technology and preparedness.

In performing these missions, EES is simultaneously making the maximum possible contribution to Georgia Tech's overall research, educational and service goals.

Locations and Facilities

Activities of the Engineering Experiment Station are housed in a number of major buildings on the Georgia Tech campus, in off-campus leased space, and in eight field offices located throughout the state. Additional operations are located in Huntsville, Ala., Eglin AFB, Fla., and Warner Robins, Ga. Facilities include well-equipped laboratories in electronics, in computer science and technology, in the physical sciences, and in most branches of engineering. EES also has a 30-acre field test site near Atlanta for research in electromagnetics, radiodirection finding, and propagation studies. The resources of the Rich Electronic Computer Center, the 5 MW reactor of the Neely Nuclear Research Center, and the extensive collections of the Price Gilbert Memorial Library are available on campus.

Staff

The EES staff represents most of the recognized fields of science and technology, with approximately 600 professionals in the full-time staff of nearly 900 persons. An additional 450 faculty, students and consultants participate in the research programs on a part-time basis.

EES aids Georgia community and business development through eight field offices located in Albany, Augusta, Carrollton, Douglas, Gainesville, Macon, Rome and Savannah.

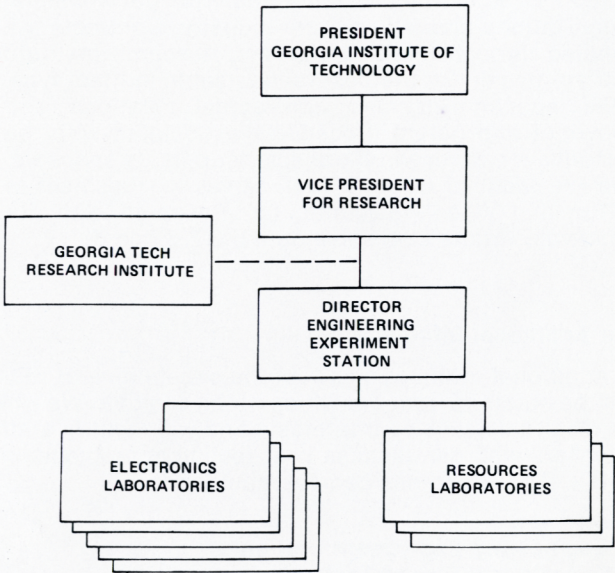
Organization

EES is an integral part of Georgia Tech. Its activities are coordinated with the research conducted by the academic colleges through the Vice President for Research.

EES is organized into eight major units according to general areas of research activity. However, interaction among the units is common, and joint teams can be readily formed in areas of mutual interest and expertise to provide optimum service to the client.

The major units of EES are:

- Electromagnetics Laboratory**
- Electronics and Computer Systems Laboratory**
- Radar and Instrumentation Laboratory**
- Systems Engineering Laboratory**
- Systems and Techniques Laboratory**
- Economic Development Laboratory**
- Energy and Materials Sciences Laboratory**
- Technology Applications Laboratory**



Areas of Research

Energy Application Programs

- Total energy systems
- Management
- Conservation
- Alternative analysis
- Optimization
- Hybrid systems
- Self-sufficient energy systems
- Cogeneration
- Wind

Solar Energy

- Process heat
- Agricultural applications
- Passive design
- Heating and cooling
- Electric power generation
- Thermal and chemical storage systems
- High-temperature applications
- Hydrogen production
- Cookers and irrigation systems
- Photovoltaics

Biomass Conversion

- Alcohol production
- Wood gasification and chemistry
- Pyrolysis
- Air emissions
- Alternate fuels for engines and turbines
- Methane production
- Coal utilization

Resources and Waste

- Resource utilization
- Waste management and treatment
- Industrial waste conversion
- Industrial process improvement
- Synergistic industrial co-siting

Mechanical, Chemical and Materials Sciences

- Crystallography
- Molecular chemistry
- Combustion chemistry
- Environmental chemistry
- Chemical processing
- Magnetic materials
- Composite materials
- Radome materials
- Complex mechanical structures and equipment
- Machine, equipment and tool design
- Materials and equipment testing
- Water and air quality

- Kinetics and atmospheric chemistry
- Carbon technology
- Polymer science
- Paints and coatings
- High-temperature materials
- Characterization of materials
- Micro-mechanics

Economic Research and Development

- Economic analysis
- Impact studies
- Manpower/training
- Community development
- Motivational analysis
- Local government technology
- Energy modeling

Business Development and Assistance

- Productivity
- Industrial health and safety
- Management and technical assistance to small business
- Minority business development
- Technology transfer
- Industrial process improvement
- Trade adjustment assistance

Electronic Systems

- Radar
- Electronic warfare (EW)
- Communications
- Radiometers
- Simulation
- Instrumentation

Electronic Components and Techniques

- Infrared/electro-optical sensors
- Target discrimination/classification
- Fire control and tracking
- Radar/laser sensors
- Guidance and seekers
- Computer/sensor interface
- Continuous wave/coherent techniques
- Solid-state electronics
- Failure analysis and reliability
- Microwave and millimeter-wave devices
- Signal processing
- Training devices and battlefield sensors
- Bonding, grounding and shielding
- Biomedical instrumentation
- Radar meteorology

Electronic Countermeasures (ECM)

- Simulation and analysis
- EW range instrumentation
- Systems requirements
- EW system software
- Tactics and strategy
- ECM/ECCM techniques
- Communications, Command & Control (C³)/Counter C³
- Aircraft survivability
- Electronic support measures (ESM)
- Satellite ESM/ECM
- Reconnaissance and surveillance
- Integrated ESM/ECM systems
- EW hardware simulators
- Foreign technology assessment
- RFDF location/direction finding
- Digital intercept/detection estimates
- Operational flight program
- Training — man/machine interface
- Computer-aided test and evaluation

Antennas, Electromagnetics and Optics

- Antenna analysis, design and development
- Electromechanical scanners
- Phased arrays
- Radar cross section (RCS) reduction
- Near-field antenna and RCS measurements
- Polarization techniques
- Absorbing and dielectric materials
- Radomes
- Radar reflectivity measurements and analysis
- Propagation phenomena/modeling
- Electromagnetic compatibility (EMC)
- Laser applications
- Remote sensing
- EM radiation effects
- Electro-optical techniques and devices
- Millimeter/submillimeter techniques and applications
- Environmental effects
- Scattering analysis

Millimeter/Submillimeter Waves

- Components, devices
- Propagation
- Subsystems
- Radar
- Radiometry
- Communications
- Instrumentation

Systems Analysis

- EM compatibility/vulnerability analysis
- Large-scale computer simulations
- Cost-benefit/effectiveness analysis
- Reliability analysis
- Economic systems
- Environmental systems
- Energy and resource systems
- Satellite systems
- Weapons systems
- Control systems
- Management systems
- Operations research
- Technology assessment, forecasting and steering
- Modeling and simulation
- Data systems analysis and design
- Psychological systems modeling and simulation
- Human factors

Computer Research

- Software applications and research
- Hardware applications and technology
- Robotics
- Command and control support
- Industrial process improvement

Biomedical Engineering

- Dielectric properties
- Cryobiology
- Radiation hazards
- Animal exposure systems
- Electromagnetic analysis of medical electronic devices
- Microwave imaging

Nuclear Studies

- Neutrino physics
- High-energy elementary particle physics
- Neutron diffraction studies
- Radiation activation analysis and applications
- Radioactive materials studies and applications

International Programs

EES conducts a variety of international research, development and educational activities. Since 1964, the Station has had projects in approximately 40 countries in Europe, Africa, Asia, Latin America and the Caribbean. Joint programs with other institutions, both in the U.S. and abroad, are actively encouraged. Current projects are in the following areas:

- Water pumps and wells
- Waste water treatment and purification
- Solar, hydro and biomass energy
- Small-scale industry development
- Training
- Appropriate technology
- Technology transfer
- Millimeter-wave techniques

Current major activities include two long-term projects in which resident EES engineers are training native counterparts to conduct programs to improve industrial productivity in Egypt and to adapt and disseminate renewable energy technologies in the Sudan.

Contractual Matters

Most of the research at the Engineering Experiment Station is supported by contracts with governmental organizations and with private industry. Contracts are handled through the Georgia Tech Research Institute and are usually of the cost-reimbursable (no fee) type. GTRI support includes contractual relations and copyright and patent procedures associated with the performance of research projects for outside sponsors. The President of Georgia Tech serves as President of GTRI; the Vice Presidents for Research and for Academic Affairs also serve on the GTRI board.

For Additional Information

Additional information about the capabilities of EES can be obtained from the Office of the Director. We will be glad to discuss your interests and will identify staff members who can discuss your technical problems in detail. Please address general inquiries to:

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