

# EES Report

ENGINEERING EXPERIMENT STATION • GEORGIA TECH

*Serving Georgia and  
the Nation*

## Unity, Morale Cited

### **Advisory Council Conducts Annual Station Review**

An advisory council of top-flight national research leaders visited EES on May 16 and 17 and found high morale and "a sense of unity and dedication."

Martin Goland, president of Southwest Research Institute and spokesperson for the External Advisory Council, said his group believes that the proposed re-organization of laboratories within EES is a "very significant improvement." The visitors also noted a transition "from internal competition to cooperation" between laboratories and divisions.

The Advisory Council recommended that EES concentrate on problems peculiar to the Southeast region. As an example, they cited Tech's work with forest products in the area of energy. The group said the industrial development program should be "accelerated and enhanced." And they suggested Tech gear up for technologies such as solar cells that will have future growth potential.

The advisors were impressed with the growth in personnel and personal services within EES, but warned that steps should be taken to guard against loss of management control and the addition of less qualified people.

External Advisory Council members who attended the annual two-day critique included: Mr. Goland, San Antonio, Tex.; Gene Durren, director of corporate engineering for the Whirlpool Corporation, Benton Harbor, Mich.; Dr. Charles M. Johnson, manager of IBM's Advanced Studies and Analysis Division, Rosslyn, Va.; Dr. Thomas F. Jones, vice president of research at M.I.T.; Jack R. Kelly, executive vice president of Scientific Atlanta; William B. Leithauser, general manager of the Range Manufacturing Department of the General Electric Co., Louisville, Ky.; Dr. J. Ross MacDonald, professor of physics at the University of North Carolina; and John McKelvey, president of Midwest Research Institute, Kansas City, Mo.

The 11-member advisory council aids EES by giving objective critiques of the Station's goals and operations. Members come from industrial, governmental and academic fields.



MARTIN GOLAND, president of Southwest Research Institute, was spokesperson for EES's External Advisory Council, which met here on May 16 and 17.

### **EES Begins Research Operations in Huntsville**

The Electromagnetics Laboratory of EES has begun operations at Redstone Arsenal in Huntsville, Ala., to facilitate research in progress under an Army contract involving missile guidance and seeker systems. EES is working with the Army to improve the effectiveness of major U.S. defensive missile systems.

EES researchers are located at MIRADCOM Army Headquarters in Huntsville on a full-time basis to test, evaluate, analyze, and model HAWK and STINGER missile systems at microwave, millimeter wave, infrared, and optical frequencies. The researchers are also testing and evaluating various missile systems using MIRADCOM's multi-million dollar Radio Frequency Simulation System and Infrared Simulation System.

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## Solar Energy Seminar Big Success

More than 2,000 persons representing foreign and national solar energy interests attended the Silver Jubilee of the International Solar Energy Society (ISES) held at the World Congress Center the last week in May. The event was hosted by Georgia Tech and the Georgia Solar Energy Association.

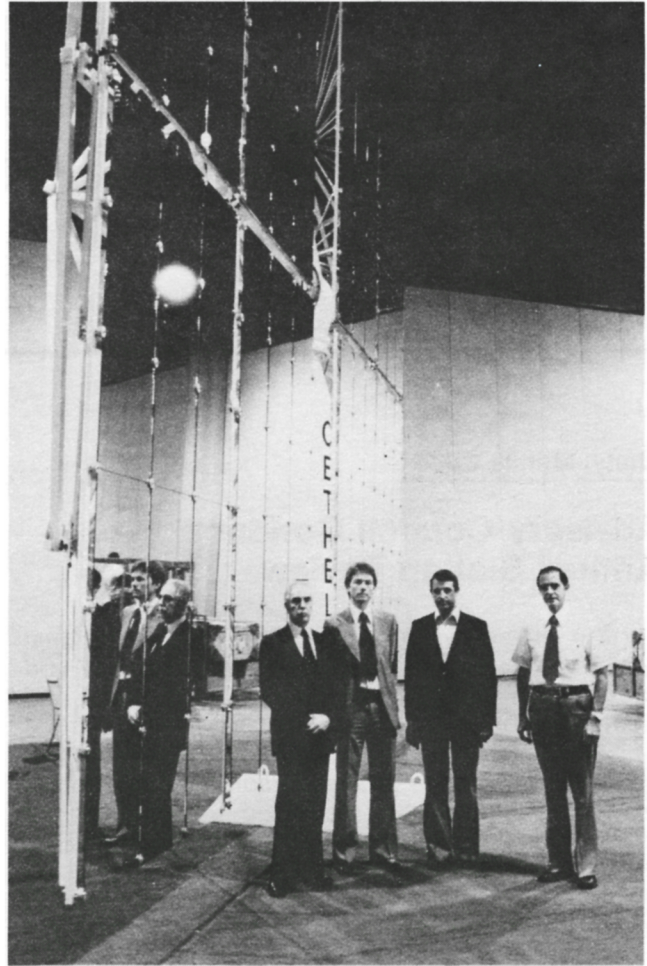
J. D. Walton of EES, local events chairman, said that the Jubilee was a resounding success, and he was particularly pleased that so many international solar energy interests were able to attend.

Among the many foreign dignitaries at the Congress was Dr. Felix Trombe, formerly of the Centre National des Recherches Scientifique in Paris, France. Georgia Tech first began high temperature solar research in Southern France in 1971 at the 1,000 kW solar furnace which Dr. Trombe designed.

Persons from EES who presented papers during the week-long congress included Steve Bomar, Tom Brown, Gary Lewis and Tom McGowan. Also making presentations were Carlos Seminario, Clarence J. Swafford, Hampton Teague, J.D. Walton and Daniel Welz.

Presentations were made by other members of the Georgia Tech community, including Dr. Al Sheppard, Associate Vice President for Research.

ISES holds an international congress every two years. The next one will be in Brighton, England, in 1981.



## Georgia Tech Studies Wood Fuel for Industry

Teaching Georgia's industry how to use wood waste for fuel is the object of a new project at the Engineering Experiment Station.

Carol Aton of EES says DOE has provided almost one million dollars for this effort to investigate wood as an alternate energy source for industry in the state. EES received this funding through the Georgia Office of Energy Resources.

"We are trying to stimulate the use of wood waste because of the current energy situation," says Aton. "Many forest-related industries are already using their wastes for fuel."

In this project EES engineers are looking at industries that have little or no experience with wood fuel. They have chosen the textile, food, carpet, and mineral processing industries as meeting this criteria.

"These are industries that not only have little experience with wood as a fuel, they do not have a readily available supply of wood," says Aton. "These types of industries are really the ones that need educating on wood wastes for fuel."

Beginning this summer, engineers, economists and forestry experts from Tech and other agencies will gear up for a highly-intensive educational program. Through seminars and plant visits, they

### TECH GETS HELIOSTAT FOR RESEARCH

Georgia Tech was given a 25-foot-high, 5-ton heliostat for solar research by CETHEL, a French conglomerate that is an international supplier of solar thermodynamic power plants. Designed to track the sun and reflect concentrated light back to a central receiver, the heliostat will be used for scientific and educational research at EES. The heliostat will also be used to develop a unique capability for a high-temperature solar furnace on the Tech campus. Pictured with the heliostat at the close of the International Solar Energy Seminar were J. P. Causse, president of CETHEL; Michael Rust of CETHEL; Alain Leroy, CETHEL project engineer; and J. D. Walton, solar energy expert from EES. (This story was excerpted from the Saturday, June 2, edition of the Atlanta Journal-Constitution.)

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will explain the how-to's of converting from conventional boilers to wood-fired boilers.

In addition, they'll have information on how much wood waste is available, where to get it, how much it costs, how cost-effective it is, and what the long-term benefits are. They will also provide information on the suitability of different types of wood fuel for different types of facilities. The three basic wood fuels are green wood chips, dry chips and dry wood pellets.

## Wood-Warmed Chickens Did Fine

Working with funds from the Georgia Department of Agriculture, EES engineers have shown that wood can provide an excellent alternative to the conventional fuels now used to heat poultry grow-out houses.

Propane, a non-renewable and sometimes hard-to-get resource, is the predominant fuel presently used to heat buildings for raising chickens. It is the rising cost of this fuel and the resultant slimmer profit margins for the farmers that are behind the move to find an alternate fuel, says Richard Combes of EES.

This past winter provided the first cold weather test for a wood-fired furnace that was installed last summer in a growout house in Carrollton, Ga. Combes said that the wood heating system was a success.

"Two flocks raised last winter were heated with warm air from the wood furnace," Combes said. "The first flock, which was shipped to market on Dec. 17, was heated 100 percent with wood heat. No propane at all was used. The second flock, shipped in February, was heated 75 percent with wood heat and 25 percent with propane. Each of these flocks consisted of about 16,200 birds."

National Weather Service figures show that the area around Carrollton experienced temperatures during the winter in the low teens with the lowest about 6 F in January. It was during these extremely low temperatures that the wood furnace had to be backed up with propane.

Georgia Tech received assistance on this research project from the Georgia Poultry Federation, which represents the state's poultry industry.

## WILTSE VISITS U.S.S.R.

Dr. James Wiltse, associate director of the Experiment Station, attended the U.S.S.R. 1979 Popov Society Congress in Moscow, May 22-24, as a representative of the Institute of Electrical and Electronics Engineers. The Popov Society is the Russian equivalent of the IEEE.

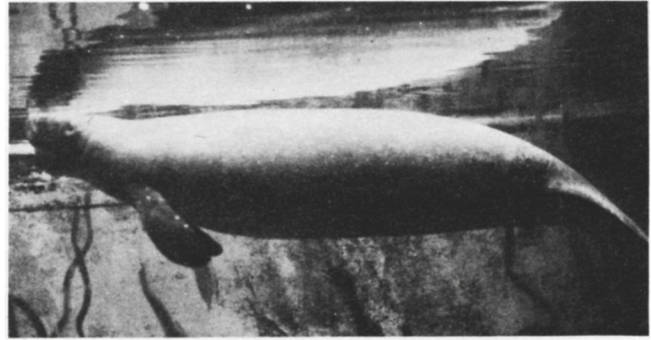
In addition to attending the Congress, Wiltse toured research centers, educational institutions, and industrial laboratories in Leningrad, Kiev and Moscow.

Dr. Wiltse, who is responsible for directing EES's electronics laboratories, has also been selected as the National Lecturer for 1979-80 by the Microwave Theory and Techniques Society (MTT-S). He will visit several American cities giving presentations on advances in millimeter-wave technology and systems.

### EES REPORT

Peggy Simcic Brönn — Editor

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AN ENDANGERED SPECIES, this manatee, or sea cow, was thought to be a mermaid by early Spanish settlers of Florida. Weighing as much as 2,000 pounds and measuring as long as 12.5 feet, this mammal is facing possible extinction due to man's encroachment in its natural habitat.

## Tech and NASA Design System To Help Save An Endangered Species

NASA and Tech have designed an electronic tracking system that may save the Florida Manatee from possible extinction.

Probably known more commonly as the sea cow, the manatee provided sailors long ago with the myth of the mermaid. Now, says Robert Michelson of EES, the myth-making manatee might not be around too much longer.

"The total number of manatees in the United States is estimated to be only about 850," says Michelson. "This figure is believed to be far below historical levels."

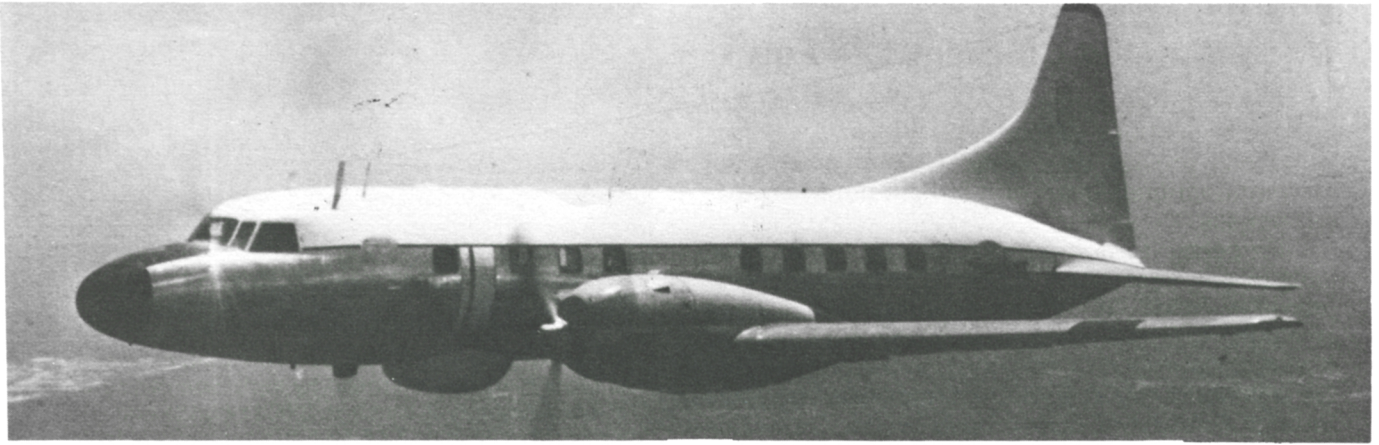
Michelson attributes the manatee's decline to man's encroachment in the animal's natural habitat. Studies show that the manatee has been steadily losing its grazing territory, and injuries inflicted by motor boats are common.

With the help of NASA, however, Michelson and a staff of electronics experts hope to put a stop to the destruction of the aquatic mammal which lives in Florida's waterways. Working closely with personnel from the Florida Fish and Wildlife Service at Kennedy Space Center's Merritt Island Wildlife Preserve, Michelson and his colleagues have come up with a way to keep tabs on the existing manatee population twenty-four hours a day.

The system, as described by Michelson, consists of radio transmitters which are attached to the sea cow. A series of strategically placed receiving stations on land then constantly monitor the animal's movements and transmit the information back to a computer.

Biologists hope that by keeping tabs on the manatee, more information will be learned about its daily movement patterns, its congregational habits, its preferred feeding spots and times, and its migratory habits.

Michelson explains that this type of information will allow wildlife experts to ensure that the correct steps are taken to preserve the species. In addition, it will provide conservationists with an adequate data base upon which to establish and justify positive action programs to preserve the species.



Currently testing radar-related techniques, Tech's Airborne Laboratory is ready for new scientific programs.

## Airborne Laboratory Ready For New Projects

Georgia Tech's airborne laboratory, a converted Convair 240, is now available for any scientific program which requires the use of a large, cargo-type, pressurized airplane, says Lee Edwards of EES.

Donated to the Engineering Experiment Station in 1977 by the U.S. Air Force, the 1953 airplane has been transformed into a laboratory which is fully equipped with sophisticated avionics equipment for communications and navigation.

"We are now using the aircraft for testing radar-related techniques developed by Georgia Tech for defense purposes," says Edwards, "but this plane can be used for just about any project that needs flight test evaluations or data collected from the air."

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The current research program consists of 11 tasks involving seeker response determination, optical performance, structural analysis, error analysis, data processing, electronic hardware, and digital software design. Some of these tasks involve the design of systems being fabricated at the Atlanta campus facilities. When completed, these systems will be taken to Huntsville for testing, evaluation and,

Some of the projects that Edwards and the staff of the Airborne Electronics Laboratory hope to do are measuring electromagnetic fields radiated by one of the Navy's most modern radars, surveying forests, and studying the trace constituents of the atmosphere such as aerosol particles and ozone. This last study, if undertaken, will be done in conjunction with Tech's School of Geophysical Sciences.

In addition to two radomes ( housings for radar antennas) the craft has been outfitted with equipment racks for mounting complex electronics systems, data recorders and operator controls. A turbine-driven auxiliary power unit has also been installed for supplying electricity to operate test equipment and all other on-board electrical equipment.

in some cases, to be incorporated into simulation facilities at MIRADCOM.

The Army Missile Research and Development Command headquartered at Huntsville is supporting the research. Funding has already exceeded \$700,000 and is expected to increase significantly over the next few years.

EES expects to have a staff of more than 50 people in the Huntsville operation within four years.

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