STATION NEWS

ENGINEERING EXPERIMENT STATION • GEORGIA TECH

VOLUME 8 NUMBER 5

JUNE, 1979

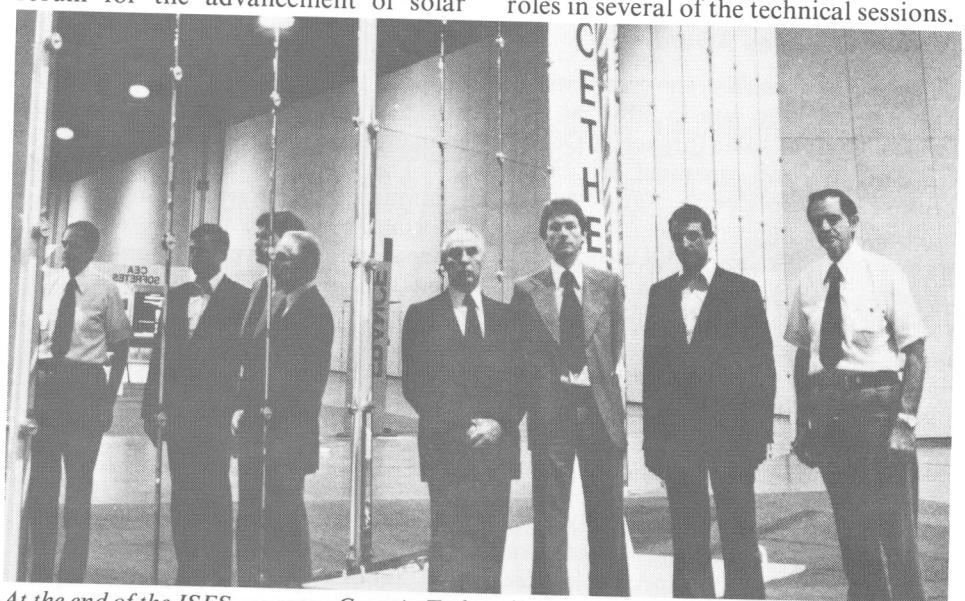
Tech Hosts Major Solar Energy Congress

More than 2,000 technical registrants — researchers, manufacturers, architects, students, and consumers — came to the Georgia World Congress Center to participate in the Silver Jubilee Congress of the International Solar Energy Society (ISES) May 28 through June 1. Georgia Tech and the Georgia Solar Energy Association hosted the congress which drew the largest number of participants ever to attend an ISES international bi-annual meeting.

Founded in Tempe, Arizona, in 1954 as a non-profit educational/scientific organization, ISES provides a forum for the advancement of solar energy through an open exchange of ideas and international development. Today, ISES has a membership of more than 10,000 people from 55 countries and all walks of life.

J. D. Walton of the EES Applied Sciences Laboratory was instrumental in bringing the conference to Atlanta and served as local arrangements chairman. A considerable volunteer effort was contributed by Walton and other EES-ISES chairmen including: **Charlie Murphy,** ASL, Congress Center Arrangements; **Steve Bomar,** ASL, Accommodations; **Elinor Plowden,** Publications, Publicity; **Joe Harris,** ASL, Printing and Publications; **Art Sales,** ASL, Education; **Tom McGowan,** TDL, Volunteer Co-ordination.

Tech researchers played major roles in several of the technical sessions.



At the end of the ISES congress, Georgia Tech was given the 50 square meter CETHEL heliostat to carry out further high temperature solar research on campus. The French design, a major attraction of the ISES Exhibition, is one of two types of heliostats which will be used in the European Economic Community 1-megawatt electric power plant to be constructed in Italy. Pictured in front of the heliostat (l-r) J. P. Causse, president of CETHEL; Michael Rust of CETHEL; Alain Leroy, CETHEL project engineer; and **J. D. Walton** *of Georgia Tech.*

Walton co-chaired a session dealing with Solar Energy in Developing Countries and presented a paper with Bomar entitled "Solar Energy Applied to the Needs of the Sub-Sahara Africa."

> Prior to the ISES Congress, Walton organized an African solar energy workshop which attracted many participants from the developing nations. The U.S.A.I.D., U.N. Development Program, and the U.N. Educational Program sponsored the workshop to bring together representatives from emerging African countries which are most affected by critical energy problems such as increasing energy costs, population growth, and deforestation.

Tom Brown, ASL, also co-chaired an ISES session, Small Power Systems, and co-authored a paper with **Hamp Teague, D. J. Swafford,** and **G. C. Lewis,** ASL, entitled "Identification of Alignment and Tracking Errors in the Open Loop, Time-Based Heliostat System of the 400kW Advanced Components Test Facility." **Brown, Teague, Dan Welz,** and **Carlos Seminario,** ASL, were also active in the poster sessions.

A. P. Sheppard, Associate Vice President for Research, co-authored a paper with **Jay Schlag,** Electrical Engineering, and Joan Wood, of the Southern Solar Energy Center, entitled "Control Systems for Interfacing Solar Agricultural Dryers with Other Energy Sources." Also in the area of solar agricultural applications, Tom McGowan, TDL, presented a paper on "Commercial Growers Passive Solar Greenhouse at Hidden Springs Nursery."

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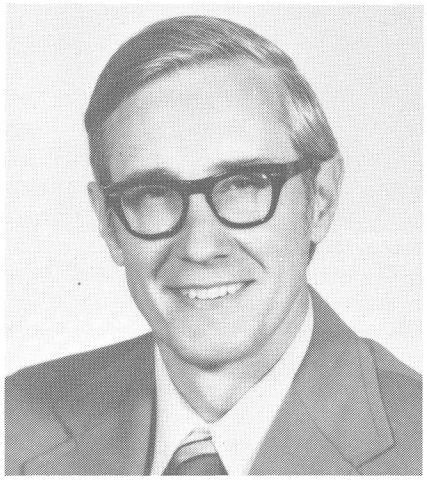
Ray Moore Named Information Director



Former television newscaster **Ray Moore** has been named director of the EES Office of Publications and Information. Moore has nearly 30 years of experience in communications, including his work with WSB-TV and NBC-TV. Moore received several awards for outstanding news coverage, including the Emmy, and the National Radio and Television News Directors Association/ Northwestern University Award.

In addition to his duties at Tech, Moore will continue in his position as Senior Vice President for Community Relations at Shenandoah Development Corporation.

Opening Address

Omi G. Walden, Department of Energy (DOE) Assistant Secretary for Conservation and Solar Applications stated in the opening address of the Congress, "No other energy resource has captured the public's imagination and interest more so than solar energy."

Walden noted that the government has begun to develop an overall policy designed for renewable resources, with an emphasis on commercialization in the areas of passive solar designs, industrial process heat, solar hot water heating, direct combustion of wood, and use of small wind machines.

International Exhibition

Almost 130 exhibitors brought displays to the World Congress Center for the Silver Jubilee Exhibition held in conjunction with the congress. The French coordinated the largest part of the exhibit hall with displays from over 30 companies and government sponsored groups under the direction of the Commissariat à l'Energie Solaire (COMES), the newly created French equivalent of DOE. Interesting displays were presented by: Omnium-G, which sent from California a 7.5 kilowatt electric nominal tracking power plant to the show; Westinghouse, who displayed a model of the parabolic dish concentrating collector which will form an integral part of the DOE Total Solar Energy system to be constructed at Shenandoah, Georgia; CETHEL, which brought a 50 square meter heliostat of the type that will be used in the European Economic Community's Eurelios 1-Megawatt Electric power plant. The CETHEL heliostat was given to Georgia Tech at the end of the conference to be used on campus to develop a high temperature solar furnace.

Tech Tours

Shuttle buses brought more than 600 visitors from the World Congress Center to Tech campus during the week to visit research sites which many termed the high point of their stay. Free tours were conducted by Tom Brown, and staff at the DOE Advanced Components Test Facility and by **Jim Knight,** TDL, and staff of the Area II bioconversion projects.

Trombe Receives Award

Georgia Tech's first involvement with solar energy was in 1971, at the French 1000kW solar furnace at Odeillo, designed and operated by Felix Trombe, of the Centre Nationale de la Recherche Scientifique. Tech has maintained close ties with Odeillo over the years and conducted many productive experiments under Trombe's supervision. Trombe was nominated as the recipient of the society's prestigious Farrington Daniels Award this year. The award is given every alternate year to an outstanding solar scientist of the world to commemorate the efforts of Daniel, the founding father of the society.

From the initial high temperature ceramics testing in France, solar research at Tech has expanded to include almost every aspect of solar thermal energy and Tech's program is often described as the largest of any U.S. university.

Vacation Time Accrual to Change

Employees with more than 45 days of vacation time must use or lose the extra time by December 31, 1979. In the past, Georgia Tech records would be adjusted at the end of the current fiscal year, June 30, 1979, but the Board of Regents has announced that employees' records will be adjusted each year on December 31, to show no more than 45 days accrual and Georgia Tech will adjust its records at the same time.

This means that if an employee has, for example, 50 days accrued on June 20, he will have six months to use the five extra days on record plus others accrued up to the month of December. After December 31, however, the extra unused days will be forfeited.

For further information, call Betty Yarborough at 894-3445.

Tech Aids Firms Affected by Imports

A program to aid firms and workers in the Southeast affected by competition from imports was the topic of a seminar held at Georgia Tech's Space Science and Technology Building June 26.

Hardy Taylor of Georgia Tech said that the seminar was held to explain the operation of the Southeastern Trade Adjustment Assistance Center. The Center was recently set up at Georgia Tech's Engineering Experiment Station for the benefit of businesses and workers adversely affected by import competition.

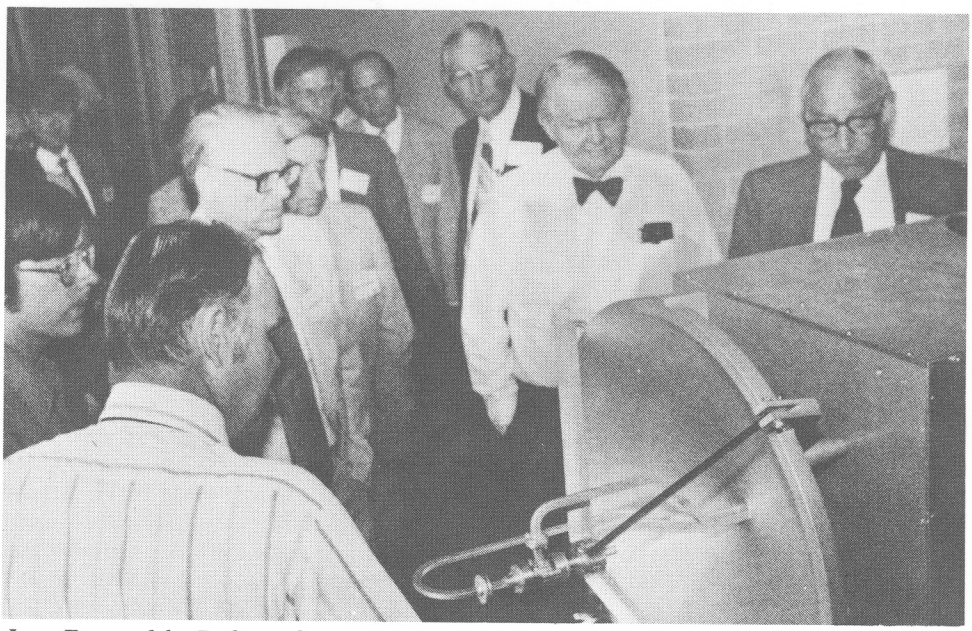
The seminar provided companies, communities, workers, and unions with information on how the assistance program works, who is eligible, and exactly what can be provided under the program.

Speakers at the seminar were H. W. Williams, Deputy Assistant Secretary of Commerce for Economic Development; Marvin Fooks, the Labor Department's Director of Trade Adjustment Assistance; and Robert W. Springfield, Associate Director of the Southeastern Trade Adjustment Assistance Center.

Serving eight states in the Southeast, the Center is funded by the Economic Development Administration of the U.S. Department of Commerce, which, along with the U.S. Department of Labor, sponsored the seminar.

Indonesians Visit Tech to Discuss Water Resources

Fifteen Indonesian sanitarians touring the U.S. under a University of Hawaii training program visited Georgia Tech May 18 for a briefing on the Office of International Program's rural water pump projects. Indonesia is establishing 11 sanitarian schools throughout the country to aid manufacturing and distribution of water pumps. Georgia Tech, with the sponsorship of the Agency for International Development (AID), is assisting with the installation and monitoring of manually operated water pumps at the schools and is also assisting Indonesians in setting up local pump manufacturing and installation operations. AID has awarded OIP a $383,000 contract to administer these activities.



Jerry Eaves *of the Radar and Instrumentation Laboratory (foreground) explains operation of a dual polarized millimeter wave instrumentation radar to members of the External Advisory Council.*

EES Begins Research Operations in Huntsville

The Electromagnetics Laboratory has begun operations at Redstone Arsenal in Huntsville, Alabama, 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.

EML 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 (RFSS) and Infrared Simulation System (IRSS).

C.E. Barnett, D.D. Tarkowski, W.M. O'Dowd, and **T.N. Long** are at the Huntsville office on a full-time basis. **J.M. Newton, D.J. Kozakoff,** and **R.W. Bird** are commuting between Huntsville and Atlanta and additional full-time staff are being recruited. EES expects to have a staff of more than 50 people in the Huntsville operation within four years.

The current research program consists of eleven 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, 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 Advisors See Progress

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

Martin Goland, President of Southwest Research Institute and spokesman for the External Advisory Council, said his group believes that the proposed reorganization 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 that will have future growth potential, such as solar cells.

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; Gene Durren, Director of Corporate Engineering for the Whirlpool Corporation, Benton Harbor, Mich.; Dr. Charles M. Johnson, Manager of IBM's Advance 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.

New Contracts

ASL African Solar Energy Workshop, **J. D. Walton,** Atlanta University, $15,310; Evaluation and Assembly of X-Band Pulsed GaAs Impatt Diode Chips, **C. T. Rucker,** General Dynamics Corporation, $31,998; Low Energy Experiment to Measure a Weak Coupling of the Neutrino Current, **T. P. Lang, Jr.,** National Science Foundation, $200,000; Assistance to Small Businesses in International Market Development for Solar Thermal Technology, **J. D. Walton,** U.S. Department of Energy, $20,000; Testing of Science Applications, Inc. Samples at Centre Nationale des Recherches Scientifiques, **S. H. Bomar, Jr.,** Science Applications, Inc., $5,500; Optical Microscopic Analysis for Asbestos, **J. L. Brown,** Georgia Department of Human Resources, $1,980; Clarke County Airport Noise Impact Study, **F. Dixon,** Drake and Funsten, $839; Conduct Magnetic Susceptibility Tests, **B. R. Livesay,** J. M. Huber Corporation, $1,500.

EML Repair and Calibration of Gravel Pit Units, **G. E. Riley,** U.S. Army Missile Research and Development Command, $8,500; Infrared Scene Synthesis and Modeling, **G. E. Riley,** U.S. Army Missile Research and Development Command, $59,646.

ETL Evaluation of Electromagnetic Interference Protection Requirements for Trackside Communication Circuits, **B. M. Jenkins,** Parsons, Brinckerhoff, Quade and Douglas, Inc./Tudor Engineering Co., $36,016; Broadcast Regulation Tradeoff Study Presentation, **R. Moss,** Federal Communications Commission, $3,500; Pacemaker Investigations, **B. M. Jenkins,** Vitatron Medical, $6,000.

OIP Extension Services to the Korea Credit Guarantee Fund, **R. W. Hammond,** Korea Credit Guarantee Fund, $55,574; Evaluation of Handpump Selection and Testing Methods, **P. W. Potts,** U.S. Agency for International Development, $10,158.

RAIL Millimeter Wave Sensor Design, Fabrication, Test, **P. P. Britt,** General Electric Company, $297,037; Maintenance Practices for Portland Cement Concrete Pavement, **J. R. Moore,** Georgia Dept. of Transportation, $10,000; Autothrottle Test Procedure Compiler, **J. E. Doss,** Marconi Avionics, Inc., $85,298; Locating Voids beneath Pavement Using Pulsed Electromagnetic Wave Techniques, **J. R. Moore,** National Academy of Sciences, $99,850; Map Digitization for Data File Manager (DFM) Input, **R. A. Hoover,** Naval Coastal Systems Center, $6,044; Millimeter Wave Transponder, **P. P. Britt,** Massachusetts Institute of Technology, $59,693.

STL Summary Comparative Assessment of Directive Antenna Beam Performance for Three Topside Antenna Arrangements, **C. E. Ryan,** Rockwell International, $1,500; 35 GHz and 95 GHz Radar Field Test, **C. P. Burns,** Johns Hopkins University, $29,974; Power Transmission and Reflection Measurements of Cloth Samples, **R. L. Moore,** Riegel Textile Corp., $12,945.

TDL A Program of Economic Development and Technical Assistance for Forsyth, Monroe County, Georgia, **G. Lee,** Monroe County Industrial Development Authority, $5,417; Industrial Energy Extension Service, **W. G. Moran,** Georgia Office of Energy Resources, $388,662; Exploratory Activation of Coal Char, **S. B. Smith,** TIGG Corporation, $750; Assist Mission and IRHE to Determine Feasibility of Production of Electricity from

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Personnel Announcements

Office of the Director **Ryan L. Mura** has joined the staff to head up Human Resources services for EES. Mura, formerly of the Department of Energy, will supervise organizational development and other employee-related areas of EES.

OIP **Henry Van,** a sanitary engineer, will join the staff June 5 as a senior research engineer. Van will work with OIP's water pump program. Henry holds a B.S. in environmental engineering from the University of Oklahoma. Since receiving his doctorate in 1977, he has been employed by El Paso Natural Gas Company. A native of Mexico and a naturalized U.S. citizen, he is married and has two children.

RAIL **H. Bennett Teates** has been hired as a Senior Research Engineer and will be working in the Computer Sciences Division. **Hank Cox** has started work in the Radar Technology Area as a co-op. Cox is presently pursuing an undergraduate degree in electrical engineering.

STL **Dr. C. W. Choi** recently joined the staff as a research scientist. Choi received his M.S. and Ph.D. degrees from the University of Kentucky and was previously employed in a research capacity at Oak Ridge National Laboratory and Scientific Atlanta. He is currently investigating plane wave scattering analysis techniques for "Hybrid On-Aircraft Antenna Pattern Analysis."

Dr. Ron Seaman recently joined the staff of the Biomedical Research Group as a research engineer and is currently contributing to projects concerned with the dielectric properties of biological materials. Seaman comes to Georgia Tech from the faculty of the University of Texas Health Sciences Center in Dallas, Texas.

Len Cayce and **Beth Brannen** were married at Myrick's Farm, Cherokee County, in an outdoor ceremony on May 5, 1979.

TDL **John Kirk** has joined the Community Energy Systems Group. Kirk is a recent graduate of Tulane University's Chemical Engineering Program.

Bill Nolte has joined TDL as a research technologist in the Energy Systems Group. Nolte, formerly employed by U.S.I. Agribusiness, manufacturers of poultry and livestock containment processing equipment, received a Mechanical Engineering Technology degree from Southern Tech Institute.

Joe Lupton has returned to TDL after an extended illness.

SERVICES **Regina Williams** recently joined the staff of the Supply Services Department as a clerk typist. **Richard Green** is a new machinist in the Mechanical Services Department.

Awards/ Presentations

ASL **Charles Murphy** was presented the Excellence Award of the American Institute for Design and Drafting in recognition of outstanding and meritorious service and significant contribution to the development and advancement of design and drafting on April 11 by AIDD President John L. Coleman.

ETL **Richard Moss** attended the Armed Forces Communications and Electronics Association Conference at the U.S. Air Force Rome Air Development Center in Syracuse, New York, and later participated in a briefing there of RADC's work in Communications, Command, Control, and Intelligence.

OIP **Phil Potts** went to London, England, May 28-June 1 as an invited participant in a water pump workshop sponsored by the Overseas Development Ministry and the World Health Organization. The group will develop a methodology and guidelines for testing water pumps worldwide.

Andy Karp was in the Dominican Republic May 7-June 1 to finalize work on the pump project there. Potts and Karp will be working on site in Togo and Benin during the month of June to continue site identification and pump installation activities.

Frank Malvar returned to the Philippines in mid-May for four weeks of on-site activity on the United Nations Industrial Development Organization pyrolysis project.

Ross Hammond leaves for Bangladesh June 13 on a consulting assignment for the United Nations Educational, Social, and Cultural Organization (UNESCO). He will be part of an eight-man team that will conduct a month-long study of current national science and technology capacity and institutional needs, as well as identify science and technology-oriented development problems.

RAIL **Ed Reedy, Jerry Eaves, Bob Trebits, Nick Currie, Bob Hayes, Jim Echard, Pete Britt, Jim Scheer** and **Lucien Bomar** attended the 8th Defense Advanced Research Projects Agency (DARPA) Tri-Service Millimeter Wave Conference at Eglin Air Force Base in April. Papers were presented by Jim Scheer, Bob Trebits, Lucien Bomar and Bob Hayes.

STL **Jerry J. Heckman** presented a paper entitled "Operational Electronic Counter Measures Pod Modification and Missile Seeker Electronic Counter Measure Tests" at the 12th Annual Electronic Warfare Symposium, Point Mugu, California, on April 10 and at the Southwestern Regional Association of Old Crows Symposium, April 23-25, in San Antonio, Texas.

Fred Cain recently participated on a committee to revise the radiation hazards of the American National Standards Institute (ANSI) in Seattle, Washington.

J. Toler and **J. Seals** presented two papers at the Bio-electromagnetics Symposium in Seattle, WA on June 18-22, 1979 entitled "Differential Consequences of Biological System Exposure to Pulsed and Continuous-Wave Electromagnetic Waves" and "Technical Aspects of Electromagnetic Techniques for Recovering Cryogenically-Preserved Large Organs."

TDL On March 26, **Jim Knight** presented a paper entitled "Pyrolytic Oils from Agricultural and Forestry Residue and Municipal Solid Waste" at the Fifth Annual Research Symposium on Municipal Solid Waste in Orlando, Florida, sponsored by the University of Central Florida and the U.S. Environmental Protection Agency. Knight also gave a lecture at the University of Maine at Orono on the "Utilization of Lignocellulosic Wastes through Pyrolysis" on May 18.

SED **W.E. Sears** and **R.P. Zimmer** co-ordinated the Electronic Warfare Techniques Analysis Quarterly Program Review, which was held on May 15 at the Georgia Tech Research Facility at Cobb County and on May 16 at the Georgia Tech main campus. Attendees included representatives from the Aeronautical Systems Division, Robins Air Logistics Command, Air Force Avionics Laboratory, Tactical Air Warfare Center. Presentations were made by S&TL, RAIL, ETL, EML, and SED.

George Fletcher presented a paper entitled, "Feasibility of Low Head Hydro Power at High Falls State Park" at the Department of Energy Small Scale Hydro Power Contractor's Symposium held in Albany, New York. On May 16, Fletcher also presented a paper to the Semi-Annual Photovoltaic Users' Conference entitled "Photovoltaic Balance of System Cost Study" held at Gatlinburg, Tennessee. Also in attendance was **Ed Jacobson.**

New Contracts

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Bio-mass, **J. Birchfield,** Agency for International Development, $5,900; A Study to Determine Labor Input Factors for Pricing Roof Trusses, **R.B. Junk,** Hoover-Universal, Inc., $900; Preparation of Booklet on Comparison of Insurance Rates, **P. Loveless,** Georgia Concrete and Products Assoc., $1,500; Branch Site Location Study, **D.A. Chase,** First National Bank of Cobb County, $4,500; Seminar on Managing Economic Development Programs, **R.B. Cassell,** Office of Local Government Management Relations, $5,892.

(Contract information — Title, Project Director, Sponsor, Amount, Laboratory — is listed as it is received in the P/I office.)

An Equal Education and Employment Opportunity Institution

STATION NEWS

Vol. 8 No. 5 June, 1979
Published monthly for employees of the Engineering Experiment Station, Georgia Institute of Technology, Atlanta, Georgia, 30332.

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Nancy Westerman	3492

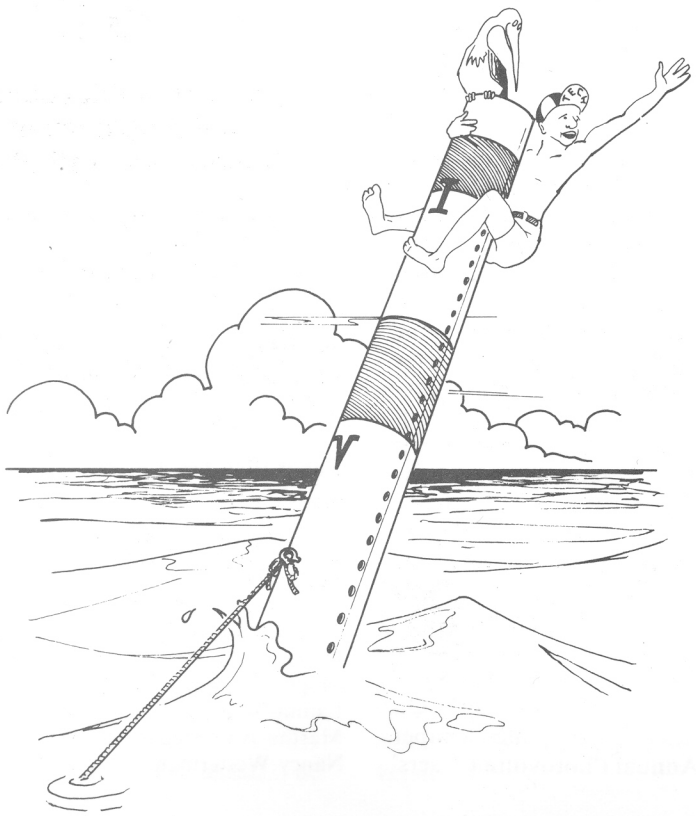
2nd Annual RAIL Tethered Buoy Award

On 27 April 1979, the Second Annual RAIL Tethered Buoy Award was presented at a gathering in the auditorium at the Cobb County Research Facility. The RAIL Buoy award was created in order to commemorate the outstanding performance of Georgia Tech personnel in field operations who, in spite of the overwhelming forces of chaos, manage to return from the field with at least one "almost repeatable" data set.

Dr. Robert (Bob) Trebits was chosen the winner for his project entitled "Millimeter Sea Noise Experiment." As a result of writing an award-winning proposal, he won a three-month, all expense paid vacation in the EES vacation sweepstakes at the Stage II Hilton (a Texaco tower, two nautical miles off the shore of Panama City). He was entertained daily by the multi-frequency radar van and by games such as "run for fun" from the Stage II Hilton deck to the "Swamp Pump Room" three floors below; and was serenaded nightly by a local group called the "Foghorn." Bob returned from the field refreshed from his "vacation" and with one "good" data tape clutched tightly in his clenched fists.

(Left to right) 2nd runner up, Don Sanford; winner, Bob Trebits; and 1st runner up, Gene Martin.

The First Runner-Up Award was presented to **Mr. E. Eugene Martin** for his sterling performance on his program entitled "Millimeter Wave Strip Mining Techniques." He was given an impractical technical task, an impossible schedule, and an insufficient amount of funds to achieve his goals. He survived flakey equipment, a swarm of GIT "experts", who spent most of their time in Las Vegas, besotted co-ops, and a simulated nuclear blast which knocked him on his --- to emerge with at least one intact data set.



The Second Runner-Up Award was presented to **Mr. Donald S. Sanford** for his project "Effects of Gulf Coast Environment on Hardware Reliability." On this project, he showed great courage and stamina in surviving the interfacing of Korean war vintage equipment in which he had incorrect schematics, random computer failures — which usually destroyed the software — lightning storms, floods, and numerous trips on airlines. Although the field operation is still continuing, the Awards Committee felt that Mr. Sanford should be recognized for all of his misery. Also, it was noted that he will be eligible for next year's award.

Prior to the presentation ceremony, brief talks were given by each of the nominees including: **Lucien Bomar** on "Environmental Testing of Millimeter Instrumentation Radars," **Jim Scheer** on "Millimeter Backscatter and Emissivity of Mud," **Frank Williamson** on "LARIAT Geological Survey," and **Dave Plummer** on "Measurement of In-Phase Return from Sea Foam." Rumor has it that Dave Plummer might have won the award except that the Awards Committee determined that he did not obtain any useful data.

Next issue:
Highlights of EES Reorganization