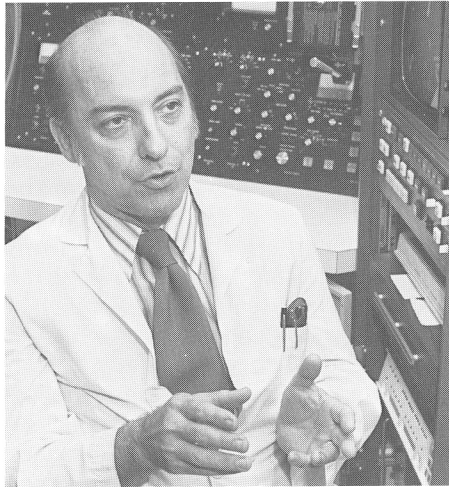
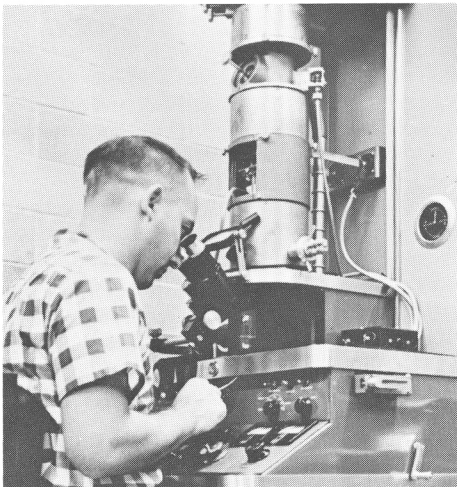


Station News

Georgia Tech Engineering Experiment Station

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May 1984



THEN AND NOW. Left: This 1957 photo shows John Brown peering into Georgia Tech's first electron microscope (an RCA transmission scope given by the Rockefeller Foundation). Right: Some 20+ years later, Brown demonstrates EES's newest scanning electron microscope.

From Chewing Gum to Spacecraft Sophisticated Instruments Analyze Microstructure

"We've studied everything from Wrigley's chewing gum to the memory system in the Mars Viking spacecraft," said John Brown, head of EMSL's Materials Characterization Branch. In between, using an array of sophisticated instruments to probe the world of the infinitesimal, they determine the causes of metal failure, examine thin plastic films, analyze asbestos air samples, and perform numerous other research services for industries, for academic institutions, and for government agencies. But the group is most widely known for its pioneering analysis of the characteristics of Georgia kaolin clay.

EES set up its first electron microscope (also the first in the Southeast) in the Hinman Building in 1947. The next year, Georgia Kaolin Company became the first industrial contractor to use the electron microscope. Other companies followed suit, and from the late '50s to the mid '60s, analysis of the physical and

chemical properties of kaolin formed a large part of the group's work. "Tech has played a large role in the success of the Georgia kaolin industry," Brown said, "and we are still actively working with five companies."

Starting with that first RCA transmission electron microscope (TEM), the group has gradually added more equipment through the years until now it has two TEMs, two scanning electron microscopes (SEMs), an electron probe microanalyzer, an X-ray diffractometer, and instruments for X-ray spectroscopy, optical spectrochemistry, and precision measurement by optical interferometry. They also have several specialized light microscopes, as well as specimen preparation facilities.

Brown, who started working for EES three months after graduating from Georgia Tech in 1950 with a B.S. in physics, has headed the materials characterization activity at EES since 1963. He has seen the work diversify

tremendously from the early emphasis on kaolin. Nowadays they perform a great deal of asbestos analysis, particularly for schools. Examination of the physical and electrical characteristics of electronic microchips has become an increasingly important part of their work as well.

About 70% of their work is performed for outside contractors, including industrial firms of many kinds, consulting engineering firms, government agencies, and universities. Another 20% is assistance to other units of EES, and 10% is work for Tech academic schools.

Five years ago they began operating as a cost center. Hourly charge rates are established for each instrument as well as for personal services. Some 40 to 80 clients are billed each month for services costing anywhere from \$35 to \$5,000.

What do they do for their outside contractors? For Wrigley, they analyzed samples from seven plants around the world to determine differences in quality due to degree of porosity and size of sugar crystals. For NASA, they have analyzed the differences in metal alloys formed in space and on earth, as well as determined the cause of a crack in a rocket engine casing. Under an ongoing contract with TVA, they currently are investigating why the steam pipes and valve cracked at the Brown's Ferry reactor in Alabama.

The Emory School of Dentistry hired them to analyze dental alloys and to compare various diamond dental drills. For Exxon, they have analyzed samples of the textured plastic film used in baby diapers. They have helped Olin Corporation determine the best composition for cigarette paper and fillers to control the burning rate. They have analyzed carbon filters and catalyst materials for Ashland Oil, and fiber optic materials for Bell Labs and

(See "Micro," page 2)

Industrial Ed Develops New Textile IE Course

Technicians in the Georgia textile industry are expanding their industrial engineering expertise through a new training course developed by the Industrial Education Department of the Technology Applications Lab. The 180-hour course, "Applied Principles of Textile Industrial Engineering," drew 20 participants from eight companies for its initial offering in the February-April period. Its success has led to scheduling a second run in September-October.

The course was developed with the financial and curriculum design support of the Textile Education Foundation and several textile companies. The faculty for the first offering comprised 12 experienced industrial engineers drawn from industry and Charles Duke from Industrial Educa-

MINICOMPUTER NEWS

This month's column describes the method by which MCSF establishes user rates for the VAX computers at the Cobb County Research Facility and the Electronics Research Building.

The rates are a function of equipment costs, direct costs, and annual use level. Prior to each fiscal year, Georgia Tech's accounting firm, Alexander Grant, collects information on capital investment in the computers and data on the anticipated direct costs for the coming fiscal year. Annual use levels are determined from past experience and expected use for the next year.

The capital investment is depreciated over a five-year period. The direct cost of operating a computer is charged out over the coming fiscal year. The total cost is the depreciation cost plus all the expected direct and indirect costs.

This projected total cost is then divided by the total hours of computer use anticipated for the upcoming fiscal year. The result is the dollars per hour expense for computer use.

Given the pre-fiscal year determination of rates, what happens when the actual costs or hours of use do not meet the projected amounts? At the end of the fiscal year, Alexander Grant

studies the actual cost and use figures. Any over collection is carried forward to offset costs in a future fiscal year. Any shortfall is carried forward as added cost.

Note that the estimates of direct costs and use are based on the history of the particular machine. Present indications are that the rates for the Cobb County and ERB computers should rise no more than 5% in FY 1985.

TAL Begins Solid Fuels Industrial Assistance

EES has a new industrial outreach service—the Solid Fuel Extension Service. Operating via a grant from the Georgia Office of Energy Resources, the service offers Georgia firms technical assistance in determining the economic and technical feasibility of converting to wood or coal fuel to meet their energy needs. Tom McGowan of the Technology Applications Lab directs the program.

Activities will include performance of feasibility studies for 20 selected firms and a summer conference in Atlanta to brief plant managers on considerations involved in converting to solid fuels.

TAL Packages Course in Effective Writing

Personnel in the Technology Transfer Branch of the Technology Applications Lab (TAL) have developed an in-house training course to improve the writing skills of scientists and engineers. The 12-hour course is designed to give the participant:

- a set of skills which facilitate the writing process,
- a heightened awareness of the editor as a partner in reporting research results, and
- an improved understanding of the report production process.

The course is organized into several modules: reader and subject analysis, planning and outlining, writing, revising, graphics, formatting and production. An innovative feature of the production module is a training game, called "Production Roulette," which they invented to simulate the entire process of producing publications.

Although the course originally was devised to improve the quality of the

publications in TAL, it recently was offered to the Industrial Extension Division of the Economic Development Lab and to participants throughout EES.

"Since people learn by doing, we use a performance-based training methodology," said Branch Head Carol Aton. For more information about the Effective Writing Refresher Course, contact her at ext. 3623.

EES Mementos Wanted

Do you have old pictures and old articles about EES activities stashed away in a dusty drawer? How about old memories and interesting anecdotes filed away in your mind?

EES is celebrating its 50th birthday this year, just one year short of Georgia Tech's 100th. Although EES history will be part of the Georgia Tech histories being compiled for the Centennial celebration, your Research Communications Office is interested in compiling more detailed information than can be included in an overall institutional history.

Photos and printed material suitable for a small, selected archival collection are solicited. If you don't have extra copies to donate, we will duplicate all material and return it to you. We also are interested in your points of view about significant events of earlier days.

If you can help, contact Martha Ann Stegar, RCO, 202 Savant, ext. 3363.

Micro

(From page 1)

Western Electric. The National Cotton Council has asked them to look at contaminants in cotton fibers.

In addition to Brown, full-time researchers in the Materials Characterization Branch are Jim Hubbard, John Sparrow and James Johnson. Charlotte Sanders keeps everything running smoothly for them and the three hourly employees.

John Brown won't be around after June 30, however. He is retiring after 34 years of distinguished service to Georgia Tech and his profession. Among other honors, he is a Fellow of the Royal Microscopy Society and past chairman of the Southeast Electron Microscopy Society. His wife, Dorothy, is a research scientist II in the Systems and Techniques Lab. Also a physicist, she was one of the first group of female scientists at EES. In addition, she has taught physics at Georgia State and in high school.

Professional Activities

ECONOMIC DEVELOPMENT LAB

Bill Plouffe participated in a panel on Export Counseling and Research Assistance at the 1984 Export Promotion Update sponsored by the Georgia World Congress Institute and its International Trade Development Center on March 20.

On March 22, **Ed Lindsey** participated in a panel on Foreign Sourcing and Contract Manufacturing presented by the Cobb International Center of the Cobb County Chamber of Commerce and the International Trade Development Center of the U.S. Small Business Administration.

John Nemeth will speak on hazardous waste to the Georgia Industrial Developers Association on May 21 and to the Manufacturers Council of Cobb County on May 22.

Johanna Williams is now a contributing editor to *Performance Management* magazine.

Larry Edens lectured on manpower analysis and training on April 12 at the Basic Economic Development short course on campus.

Bill Darley recently spoke on "Targeting Industries for Georgia Communities" to the CSRA Industrial Development Council in Augusta. The Council comprises representatives from 36 communities in the Central Savannah River Planning and Development Commission area.

ELECTROMAGNETICS LAB

Marshall Weathersby presented a paper, coauthored by **Darrell Lamm**, entitled "Captive Flight Testing of Dual-Band Infrared Seekers in Arid and Semi-Tropical Environments" at the National IRIS Meeting in San Francisco on May 9.

As chairperson of the SPIE Applications of Artificial Intelligence Conference, held May 2-4 in Washington, D.C., **John Gilmore** presented two tutorials on artificial intelligence and presented a paper on autonomous helicopter systems.

Welcome back to **Doug Guillory**, returning from an antenna installation in Bangladesh, and to **Nick Faust**, returning from LANDSAT work in mainland China. Bon voyage to **Joe Newton**, **Avery Davis**, **Le Sun**, and **Don Bagwell**, who are in Taipei, Taiwan, for a simulator installation, and to **Joe Gagliano**, **Bob Platt**, and **Tom Stouffer**, who are bound for Kansas and Norway for radiometer flights.

ELECTRONICS & COMPUTER SYSTEMS LAB

At the 1984 National Symposium on Electromagnetic Compatibility in San Antonio, TX, on April 24-26, **Hugh Denny** presented a paper entitled "Intermodulation Interference Generated in Coaxial

Cables and Connectors," coauthored with **Tim Shands** and **Jimmy Woody**; **John Mantovani** presented a paper, coauthored with **Denny**, on "Technique for Locating Passive Intermodulation Interference Sources."

President Pettit has named **Jim Mahaffey** chairman of the Nuclear Safeguards Committee, which monitors the operation of nuclear reactors on the Tech campus.

On May 3-4, **Ricky Moore** hosted a conference on passive countermeasure systems that included representatives from 10 NATO countries. The Fort Belvoir R&D Center sponsored the meeting.

ENERGY & MATERIALS SCIENCES LAB

Hans Spauschus represented EES at the Hanover Fair in West Germany March 25-April 7.

Kathryn V. Logan presented a paper on "Synthesis of TiB₂ by Thermite Reactions" at the annual Ceramic Society Meeting in Pittsburgh on April 30; **J. D. Walton** was coauthor. Logan also has been elected a member of Sigma Xi.

SYSTEMS ENGINEERING LAB

Fred Cox is serving on the KAPSE Interface Team—Industry/Academia (KITIA), a technical advisory group to the Department of Defense on Ada Programming Support Environments (APSE's).

Bob Wohlers and **Charlie Krebs** will travel to London to participate in a joint U.S. Army/British working group on the remotely piloted vehicle.

At the Ninth Annual Electronic Warfare Symposium at Warner Robins sponsored by the Dixie Crow Club, SEL had a display booth and **Tim Strike** presented a paper entitled "RWR-Jammer Interfaces."

TECHNOLOGY APPLICATIONS LAB

Carol Aton, **Claudia Huff**, **Alan Pashkevich**, **Phil Potts**, and **Ginny Thomas** presented "Practitioners' Roundtable: The View from the Field" at the Technology Transfer in the Modern World Conference conducted by the Georgia Tech School of Social Sciences April 26-27 under funding by the U.S. Department of Education.

At the International Technical Communication Conference in Seattle, WA, April 29-May 2, **Claudia Huff** and **Ginny Thomas** conducted a workshop entitled "Sensitizing Researchers to Technical Publication Production"; a paper by Huff, "Success through Simulation: Experiential Training in Writing Skills for Research Scientists and Engineers at Georgia Tech," was published in the Proceedings.

"Microwave Heating and Drying in Textile Processing—Present and Future," a paper by **Lamar Griffin** and **Bo Hendrix**, was published in the Proceedings of the IEEE 1984 Annual Textile Industry Technical Conference held in Atlanta May 2-3.

On March 27, **Craig Wyvill** spoke on computer management of poultry housing at the Pacific Egg and Poultry Association's Poultry Processors Workshop in San Diego. He presented a paper entitled "An Assessment of the Potential for Water Recycle in the Pulp and Paper Industry" at the 1984 Environmental Conference of TAPPI in Savannah on April 10.

Tom McGowan was an invited speaker at a Boiler Design Seminar hosted by the Canadian government in Ottawa, Canada, on April 24.



EDL's Technology Utilization and Commercialization Center (TUCC) got high marks when federal officials visited the campus in April. TUCC is one of nine such centers nationwide funded by the Minority Business Development Agency (MBDA) to help minority investors and entrepreneurs commercialize promising new technologies. TUCC also serves as the primary technical and engineering evaluation resource for the national network. Shown (L-R) are MBDA Deputy Director Theron Bell, TUCC Director Ed Bethea, and Paul Jones, new director of MBDA's Atlanta Region.

Strictly Personal

ECONOMIC DEVELOPMENT LAB

Marsha White is the new senior secretary for the Southeastern Trade Adjustment Assistance Center.

The Rural Assistance Program and Technology Utilization and Commercialization Center have hired a staff assistant, **Davidayon Kelley**.

ELECTROMAGNETICS LAB

Welcome to new employees **Alix Howard**, research engineer I, **Bob Platt**, research engineer I, **James Williamson**, research scientist I, and **Loretta Williamson**, senior secretary.

Farewell to departing employees **Mike Sinclair** and **Don Bagwell**.

Wedding bells rang on May 12 for **Bob Platt**, who was married to Belinda Carter, and for **Ron Forsythe**, who was married to former ECSL employee **Alice Miller**.

ELECTRONICS & COMPUTER SYSTEMS LAB

Welcome to **Janice Davis**, administrative secretary, who has returned to Tech after the birth of her son, and to **Scott Wearn**, research engineer I, who transferred from RAIL.

Larry Jackson has resigned.

Belated congratulations to **Pat and Ron Seaman** on the birth of Christopher Thomas on December 16.

MINICOMPUTER SERVICE FACILITY

Welcome to new staff members **John W. Gowens**, senior research scientist, and **Charles L. Dickson**, senior research associate.

RADAR & INSTRUMENTATION LAB

Kenneth Spann is a new electronics technician II at Fort Monmouth. RAIL also welcomes **Molly Gary**, research scientist I, and **John Thompson**, student assistant.

SYSTEMS & TECHNIQUES LAB

STL said good-bye in April to **Tony Gunther** and **Robert Bryans, Jr.**

Jack Bridges has just returned to work after an extended illness.

SYSTEMS ENGINEERING LAB

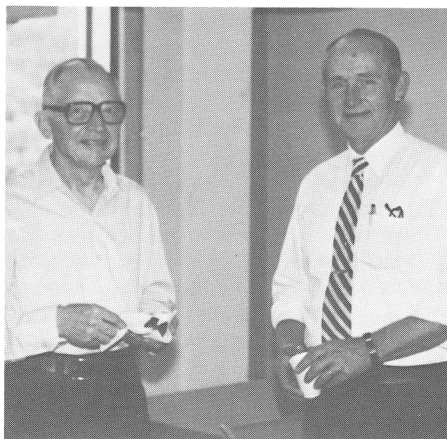
Steve Callahan is leaving and moving to California.

Pat Page (whose husband, Jim, works for RAIL) is cutting back to 60% time in anticipation of a new arrival the end of May.

Kathy Schlag plays cello in the DeKalb Symphony.

TECHNOLOGY APPLICATIONS LAB

Welcome to **George Cokkinides**, research engineer I, and **Sim Sorrow**, research scientist I.



Hank Prinsen (left) and Sam Alford enjoy the festivities at Hank's retirement coffee.

Prinsen Retires with STL Honors

Hendrik Prinsen received the first award "For Outstanding Performance in Electronics" issued by the Defense Electronics Division of the Systems and Techniques Lab (STL) upon the occasion of his retirement on April 30. The award was presented at a recent coffee klatch held in his honor.

Prinsen joined EES in November 1979, after having served as a distinguished principal engineer at Calspan Corporation for many years. He played a key role in the XM04 radar program, one of the largest research programs ever conducted at EES.

Division Chief Joe Parks said, "Hank Prinsen is the kind of research engineer that all of us should emulate. He is competent, consistent, on time and under budget. It has been my personal privilege to work with him for the last 4½ years. I wish him well, and we in STL will miss him enormously."

Prinsen has agreed to assist STL for a brief time on an hourly as needed basis in the training phase of the XM04 program.

New Video Services Available from RCO

The Research Communications Office is moving ahead in the electronics age by acquiring the capability to record and edit videotapes.

RCO, in cooperation with the Tech News Bureau, now has the camera, lights, editing equipment, and skills to produce 3/4 inch videotape that will

meet commercial broadcast standards. Transfers from 3/4 inch to 1/2 inch tape, and vice versa, can be provided. The equipment makes it possible to transfer a 35mm slide program to videotape as well. With some advance notice, programs or features can also be recorded as they are broadcast on commercial or public television.

The equipment is portable for recording in the laboratory or in the field. Some of the possible uses include recording technical events and field test site information to help with contract development and technical presentations, staff training and recruiting, progress reports to sponsors, and stories for news broadcast.

Commercial videotape facilities generally charge from \$800 to \$1,200 a day plus expenses. Rates for the campus service will be \$400 a day or \$60 an hour for shooting, \$40 an hour for editing, and \$15 an hour for dubbing. Ordinarily, RCO will not charge EES clients for its services in script writing or production. When taping is done for the Office of the Director or EES labs, charges will consist only of pay for technicians plus other expenses such as videotape and other raw materials at cost.

If you have questions or suggestions, please call Ray Moore or Lee Hughey at ext. 3444.

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