Station News

Georgia Tech Engineering Experiment Station

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Employees Learn Project Management

Ninety-four EES employees have completed the Introductory Project Management Course offered by EES. Selected by their laboratory directors, the participants generally have been at EES less than three years.

The course was designed to supplement in an organized manner the informal and on-the-job training in project management regularly received by EES employees. Its objective is to acquaint new and prospective project directors with some of the resources for completing their projects successfully within time constraints and cost limitations.

"We have offered the nine-hour basic course four times since last October," said Course Coordinator **Bob Collier.** "Now we're planning to update the course and use it for entry-level training of new professional employees in the future. Beginning this fall, we'll schedule the course once or twice a year, depending on demand."

Collier currently is working on plans for a series of more advanced managerial courses for professional personnel who desire to sharpen their capabilities. "These courses will be designed within personnel availability and cost constraints," Collier said.

The management courses are a new aspect of EES' ongoing professional development program for research personnel. Other opportunities include tuition reimbursement for coursework toward advanced degrees, financial support for professional organization leadership activities and conference attendance, supplementary funds for foreign travel that will enhance research programs at Georgia Tech, and various other programs. A brochure describing these professional staff development programs is available from Personnel Services, ext. 3445.

Visitors from the European Research Institute of Ireland (ERII) were at Tech January 11-22 for training in EES procedures. Above, they confer on research matters in the office of Vice President for Research Tom Stelson. Shown, left to right, are: John Mallon, ERII; Stelson; Don Grace, EES director; Ian Richmond, ERII; Dan O'Neil, EES and ERII chief executive; William Donegan, ERII administrative manager. Not shown: Bridgit Vaughn, ERII. (Photo by Charles Haynes)

EDL Group Tackles Art-Related Health Hazards At Cyclorama

Since 1929 a cycloramic painting, *The Battle of Atlanta,* has been displayed in a building in Grant Park called the Atlanta Cyclorama. Because of the effects of aging, this nearly 100-year-old 15-meter by 115-meter circular painting began undergoing restoration in 1979 under the expert care of Berger Art Conservation, Inc., of New York.

So how does Georgia Tech enter the picture? Well, restoring enormous paintings is a hazardous activity. Scaffolding had to be erected along the top of the circular building, and potentially toxic chemicals were used in cleaning the painting and the rear of the canvas. To ensure the protection of the artists at the site, Robert Jones, Berger's Atlanta-based project coordinator, arranged for the Safety and Health Services Group of the Economic Development Lab to advise on this aspect of the work.

"We had only limited experience in dealing with art-related hazards," recalls Tech health consultant **Phil Williams**, "but the uniqueness of the project and the fact that many of us in the program had been to the Cyclorama as kids stirred both our professional and personal interest."

EES health consultant **Ken Smith** accompanied Williams on a general site survey as work got under way. The two men looked for potential occupational health hazards, catalogued all the chemicals and processes that would be used, recommended the use of respirators and "space suits," and suggested that Tech safety consultant **Steve Kramer** conduct a complete safety audit of the site. Kramer followed up with key recommendations regarding the use of proper fall-protection methods for artists working at high elevations and the need for an alternate entrance and exit through the building's roof.

Sometime later, Williams learned that two artists who had chosen not to wear respirators had experienced headaches, nausea, vomiting and weakness while cleaning the painting prior to restoration. One also noticed

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Microelectronics Research Center

Georgia Tech has launched a Microelectronics Research Center with Electrical Engineering Professor **John W. Hooper** as director. The center will provide formal coordination of existing campus programs in microelectronics within the established academic and EES organizational structure. It also will facilitate the development of cooperative research among the units.

"We anticipate a broad base of participation by EES in the work of the Microelectronics Research Center," Hooper said. He stressed that the center is not a new research unit, but simply a means of fostering interaction among existing units. "We expect the center to give Georgia Tech greater public visibility in this field, leading to increased research contract activity. It also is a way to acquire and utilize major facilities that any one of the existing units would be unable to handle," he added.

Administrative functions will be housed within the Office of Interdisciplinary Programs, and research facilities will be located on the ground floor of the EE building. An advisory group drawn from participating schools and EES will provide policy direction. A five-person technical group will advise on research program content.

Electronics Under The Sun

Reminder: The *Southcon/82* high-technology electronics exhibition and convention is coming up in Orlando March 23-25. Complimentary registration cards are available from **J. W. Dees** at the Georgia Tech Office of Contract Administration.

Short Courses Scheduled

March 2-3 *Coal and Wood for Industrial Plants.* Grant B. Curtis (TAL), faculty.

March 8-9 *Laser Technology and Systems Applications.* Albert P. Sheppard (VP/R) and James C. Wiltse (EES), academic administrators.

March 10-12 *Infrared Technology and Applications.* Sheppard and Wiltse, academic administrators.

For further information, contact Continuing Education.

Conservators cleaning the Cyclorama canvas wore air-supplied "space suits" to protect them from chemical poisoning.

Cyclorama, Continued

redness in her urine. Williams' earlier sampling had revealed the presence of arsenic on the site — it had been used in paint pigments and for pest control — and the symptoms suggested possible arsine poisoning. The women were advised to consult a physician. When further sampling revealed the presence of arsine (a gaseous arsenic derivative), workers again were advised to use air-supplied respirators, and did so.

"This was a complex chemical reaction that couldn't have been predicted," Williams says. "I know of only one other case in the literature where arsine was generated under alkaline conditions such as at the Cylorama."

The generation and detection of arsine in this unlikely context prompted both the *American Industrial Hygiene Association Journal* and *Art Papers* to publish accounts of this case. A third paper is being considered for publication in *Occupational Health and Safety.*

When the Atlanta Cyclorama reopens to the public this summer, thousands of visitors will view the restored painting and feel gratified by the extreme care taken to preserve this important work. Few, however, will realize that the artists who performed the restoration required their own sort of protection and that Georgia Tech was able to provide it.

Anthony DeCurtis

SEL Group Blends And Electrical Eng

Recent years have brought increasing recognition of how psychological and human factors research can contribute to the design and optimization of complex human-machine systems. Actively participating in such research is the Psychological Systems Group (PSG) in the Systems Engineering Lab (SEL).

Dr. **Ted Doll** heads the PSG. "Our goal," he says, "is to analyze and optimize human performance in complex systems, particularly electronics systems." The group's work involves close collaboration among electrical engineers **Harold Engler** and **W. E. (Bud) Sears** (chief, Concepts Analysis Division, SEL) and individuals with backgrounds in experimental psychology, including Doll, **Joanne Green, Linda Leiker** and **Larry Najjar.**

One of the more recent and intriguing PSG projects is examining the impact of cerebral hemisphere processing resources on human performance. The research, directed by Dr. Joanne Green, has implications for the design of electronics systems and for predicting human performance in these systems. The cerebrum is the largest part of the brain and is divided into two distinct, nearly symmetrical hemispheres.

According to Green, interest in this area was stimulated by Nobel Prize winner Roger Sperry's study of "split-brain" patients. In these individuals, the major connection between the hemispheres has been severed for medical reasons. Study of their behavior provides dramatic evidence of the independence and uniqueness of each brain hemisphere. "In fact, in split-brain individuals," Green points out, "the hemispheres can sometimes direct opposing responses."

"As a result of Sperry's work, no longer do scientists view the cerebrum of normal individuals with connected hemispheres as a single information processor with the verbal, left hemisphere predominating," Green adds. "More recent studies suggest that the hemispheres operate more like two independent, though highly interactive processors, each with its own specialized capabilities and resources."

The SEL project focuses on how the independent processing resources of the two hemispheres may affect human performance of simple tasks. A special facility has

Psychology
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been established in the Electronics Research Building to perform the research. This facility records the behavior of normal individuals performing simple tasks which can be used to infer hemispheric operation. The experiments will identify conditions in which performance suffers because the processing capabilities of one of the hemispheres is being overloaded. The results will be useful in designing display and response tasks which optimize performance in electronics systems. Funding for the research comes from the U.S. Army Research Institute for the Behavioral and Social Sciences.

This program is only one of several human performance research programs conducted by the Psychological Systems Group. PSG projects have included development of training curricula, modeling of behavior, and analysis of human perceptual capabilities.

The modeling effort, sponsored by the Air Force Human Resources Laboratory, produced a computer simulation of continuous control behavior (e.g., driving a car) called the Human Operator Performance Er tor, or HOPE. HOPE is a model with a rather unique capability — it can learn.

"Although there are many models of human control behavior," Green says, "very few can actually represent and describe the learning of the behavior." HOPE begins with no knowledge of how to perform and gradually accrues that knowledge from experience. Studies in the PSG lab suggest that the model's learning closely resembles human learning.

PSG also is studying human visual capabilities, especially as they affect the performance of radar operators. This work, performed for the Air Force Aeronautical Systems Division, involves analyzing and testing the human capability to detect subtle differences between signals appearing on a visual display. The ultimate goal is to be able to understand and predict the behavior of radar operators viewing signals on radar displays.

PSG aims to expand and diversify future efforts. Areas of interest include improvement of human-computer interaction and the application of voice synthesis/recognition technology to human-machine communications.

Joanne Green

EDL's Safety and Health Services Branch hosted a meeting of a subcommittee of the American National Standards Institute (ANSI) on the Georgia Tech campus January 20-21. Steve Kramer of EDL is a member of the subcommittee, which is writing a set of standards covering the minimum performance requirements to be applied to the manufacture, care and use of guards, devices and methods to protect machine operators from injury at the point of operation. The subcommittee, composed principally of representatives of manufacturers and major users of machine tool guards and devices, is developing voluntary consensus standards. (Photo by Charles Haynes).

Gallagher, Rucker Named IEEE Fellows

ECONOMIC DEVELOPMENT LAB

Jim Mercer lectured on "The Role of University Extension in Economic Development" at the Continuing Education course on Public/Private Partnership in Urban Development Financing held on campus January 13-15.

On December 16, **William Spain** delivered a lecture on "Safety and Health Aspects of Powder Processing" at the Institute for Applied Pharmaceutical Sciences in East Brunswick, N.J.

Fred Tarpley chaired a session and coauthored a paper on "Venture Capital and Local Economic Development" for the Allied Social Science Convention on December 28 in Washington, D.C. He also visited the Irish Innovation Centre in Limerick, Ireland.

In January, **Judi Komaki** gave two final briefings on results of her three-year preventive maintenance research at Camp Lejeune, N.C., and at the U.S. Marine Corps headquarters in Washington, D.C.

Phil Loveless attended the Maynard Operations Sequence Technique (MOST) course sponsored by the Maynard Management Institute December 7-11 in Charlotte, N.C.

ELECTROMAGNETICS LAB

Charlie Rucker and **Jim Gallagher** have been elected Fellows of the Institute of Electrical and Electronics Engineers. Congratulations to them for a great honor.

ENERGY & MATERIALS SCIENCES LAB

On January 18-22, **Tom Brown, Tom Elfe, Joe Harris** and **J. D. Walton** attended a joint technical meeting of the American Ceramic Society and the Solar Thermal Test Facilities Users' Association on high-temperature materials applications in solar energy, held in Cocoa Beach, Fla. Brown, Elfe and Walton presented papers, and Brown and Walton chaired sessions.

RADAR & INSTRUMENTATION LAB

At the Electromagnetic Radiating Source Elimination (ERASE) conference held in San Diego in January, RAIL staffers presented the following papers: **Harold Bassett** and **Charlie Brown**, "Seeker to Target End Game Simulation for Dual-Mode Anti-Radiation Missiles"; **Carl Cash**, "Helicopter Mast Mounted Sensor Analysis"; **Charlie Brown**, "MMW Retroflection Guidance Concept for Dual Mode ARM."

SYSTEMS & TECHNIQUES LAB

David Tsao presented a paper at the National Radio Science Meeting in Boulder, Col., January 13-15. The paper, entitled "Range Selection Consideration for Cylindrical Near-Field Measurements," had as coauthors **C. P. Burns, Virginia Jory** and **Don Bodnar.**

Retirees Honored

A new EES tradition got off to an auspicious start January 22 when the first Retirement Reception was held in the Alumni/Faculty House ballroom. Plans are to have these receptions twice yearly, in January and June.

Honorees were **Mary Edna Anders**, Economic Development Lab, **Robert D. Hayes** and **John F. Kinney**, Radar and Instrumentation Lab, and **Charles M. Harrison,** Systems and Techniques Lab. They received individually engraved plaques.

New retirees receive plaques at first EES Retirement Reception. Shown with EES Director Don Grace are retirees (left to right) Robert Hayes, John Kinney and Charles Harrison. Not pictured: Mary Edna Anders. (Photo by Pat Stone)

Principal Research Scientist **Mary Edna Anders** came to Tech in 1958, after receiving her doctorate in library science from Columbia University, to establish the Basic Data Collection in the Industrial Development Division (now EDL). She is widely recognized in the library profession as a pioneer in demonstrating the information delivery capabilities of librarians, and is considered the leading authority on the history, development and characteristics of libraries in the Southeast. She is the recipient of several awards for her outstanding contributions to librarianship. She has retired to her family home in Alabama.

Charlie Harrison, research engineer II, is a mechanical engineering graduate of Georgia Tech. "In his first pass through EES (1957-1966)," says his boss, **Sam Alford**, "Charlie was one of the gang that started EES off in the radar business." After a stint as chairman of the science department at Brandon Hall School, he joined the STL staff in 1979 to provide administrative assistance and technical editing services. His retirement destination is the North Carolina mountains.

Principal Research Engineer **Bob Hayes** has an international reputation in the fields of microwave techniques, advanced communication and telemetry systems, radar systems and radiometers. Bob has worked at Tech since 1954, except for a two-year break in Florida. He received both his M.S. and Ph.D. in electrical engineering from Tech. During most of his years on campus, he has been a favorite EE professor as well as a valuable member of the RAIL staff. Retirement plans include "some teaching and some consulting." Some retirement!

Jack Kinney's 34 years of continuous service at EES must be a record. A senior research engineer, he headed the Thermo and Fluid Dynamics Branch for ten years and the Mechanical and Industrial Sciences Branch for four years. He also is a Tech graduate, with an M.S. in chemical engineering. In recent years, he has directed projects in flash/bang/smoke development, indirect fire instrumentation, and mine countermeasures.

New Employees Join EES Staff

ELECTROMAGNETICS LAB

The Physical Sciences Division welcomes **Chris Summers**, principal research scientist, and **Jimmy Ross**, electronics technician I.

ELECTRONICS & COMPUTER SYSTEMS LAB

Joining the Computer Technology & Applications Division on the research engineer I level are **Michael Witten** and **William Gaylord.**

ENERGY & MATERIALS SCIENCES LAB

Ching Chuang was married to Cheng-Ni Ou on January 24.

RADAR & INSTRUMENTATION LAB

Steve Hunt has resigned and is moving to Florida. **Roger Johnson** has transferred to the Systems Engineering Lab.

SERVICE GROUPS

Accounting: **Jim Allison** has a boy, Nicholas James, born January 15.

Facilities Management: **Garry Robinson** has progressed to full-time maintenance worker, and **Victor Jones** has been hired as a mail clerk.

Mechanical Services: **Gene Dixon** has been promoted to machine shop foreman. **Cindy Frayer** has returned from a leave of absence.

Personnel Services: **Kay Clark** was promoted to administrative assistant.

Research Property Management: New employees are **Bert Watkins**, administrative assistant, and **Sophia Massenburg**, secretary.

Supply Services: **Jerry Brown** is a new stores clerk; **James Gordy** has terminated.

SYSTEMS ENGINEERING LAB

Research engineer I additions are **Walter Addison** and **Catherine Powell**, Defense Systems Divison, and **Christopher Hall**, Concepts Analysis Division.

Armand Masse, Jim Frawley and **Michael Minardi** received master's degrees in electrical engineering in December.

Bob Newsom and Michele Sewell were married on January 9.

Cindy and **Tim Strike** have a boy, Bryan Andrew, born January 24.

SYSTEMS & TECHNIQUES LAB

Richard Ivy is a new research engineer I in the Defense Electronics Division.

Robin Eaves was married to Tim Price on December 24.

Trisha and **Steve Price** welcomed a daughter, Bethany Elizabeth, December 5.

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