The GTRI Connector

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On work

• The trouble with this world is that too many people try to go through life with a catcher's mitt on both hands.
— *Kent Ruth*

• A man who rows the boat generally doesn't have time to rock it.
— *Unknown*

• Opportunities are never lost. The other fellow takes those you miss.
— *Anonymous*

Employees get report on the state of GTRI

By Martha Ann Stegar, RCO

The annual roundup of the state of GTRI was held October 8, 9 and 12 this year, and it covered a wide range of topics.

GTRI Director Don Grace began with the usual financial summary, and the picture was better than some had expected. (For figures, see *Vital Statistics* box.) Highlights:

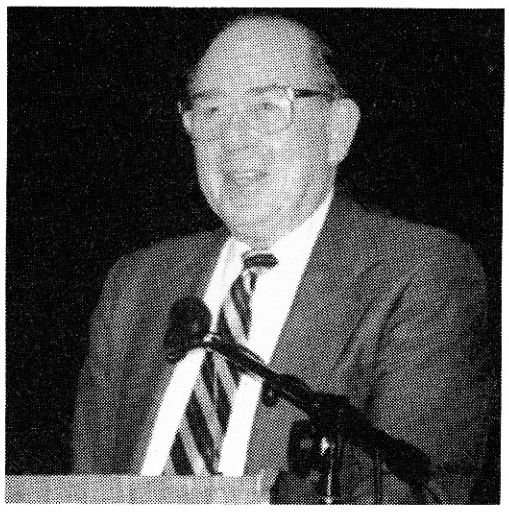
• Total expenditures in FY92 were down 1.3% from FY91.

• Sponsored personal services (salaries and wages) were down 2.6%.

• While research awards decreased 24%, Dr. Grace explained that OCA counts only the dollars actually appropriated during the fiscal year, not the total amount of a multi-year contract. He also pointed out that awards in the first quarter of FY93 were up 22% from the first three months of FY92. In addition, this increase does not take into account three large programs that came in at the end of the government fiscal year (September 30), as OCA can't log in a project until the contract is signed and in their hands.

• The Department of Defense's share of the sponsorship pie was almost identical to the previous year (82%), but other federal agencies rose to 5.5%, as opposed to a 4.2% share in FY91. "We're trying to expand our non-DoD work, while keeping the defense work we already have," Dr. Grace said.

• As expected, State funding and overhead decreased. In FY93, the federal government is limiting administrative overhead to 26%, a measure which "we're still fighting," Dr. Grace said. The cap brings total overhead to 46.6%, some 2.4% less than it would have been without the cap.



GTRI Director Don Grace gives his annual state of GTRI report at the GTRI—Present and Future meetings. (Photo by Margaret Barrett)

• Total staff went down 8%, a loss attributable principally to decreases in part-time student employees. The number of research professionals dropped by 3% (21 individuals) and full-time support staff by 5% (17 persons); but GRAs and graduate co-ops fell by 8%, co-ops by 15%, and student assistants by 53.6% — representing an overall loss of 76 students.

• OOD has only one half the amount of discretionary funds at its disposal in FY93 as it did last year. This is due principally to the drastic change in the overhead rates, Dr. Grace said. The cut means that the money for implementing the GTRI objectives set forth in the Strategic Plan had to be severely curtailed, and no money could be allocated to STGC for funding new internal research projects. Only programs already under way are being funded this year, Dr. Grace said, but they are trying to get industrial firms to pick up the tab for some of the STGC research. The equipment and facilities budget

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Vital Statistics

How is GTRI faring? Here are some statistics for FY91 and FY92:

Total Expenditures	
1991	$100.5 million
1992	$99.2 million
Research Awards	
1991	$98.3 million
1992	$75.1 million (includes $19 million July—Sept.)
1993	$23 million (July—Sept. only)
Contract Backlog	
1991	$43 million
1992	$41.5 million
Research Sponsors	
Department of Defense	
1991	82.1%
1992	81.9%
Other Federal Government	
1991	4.2%
1992	5.5%
State and Local Government	
1991	0.9%
1992	0.7%
Industry	
1991	12.8%
1992	11.9%
Total Employees (as of June 30)	
1991	1,466
1992	1,350

GTRI funding is still down, but the money picture looks brighter than expected.

Observed & Noted

The OOD Councils and their memberships are listed *on page 2.*

■

The Cogswell Award plaque for excellence in industrial security was presented to Georgia Tech in a ceremony September 29. *See page 3.*

■

This month, the Internal Research spotlight is on the use of wavelets in signal processing. *Details are on page 3.*

■

The GTRI Mentee/Mentor Program is teaching contract development skills to a promising crop of young researchers. Mentees' comments on their experiences and what they've learned are *on pages 4 and 5.*

■

Roc Tschirhart talks a plant manager through a dangerous situation. *Story and photo are on page 5.*

■

Several GTRI staffers are helping to teach Tech freshmen college survival skills. *Read about it on page 6.*

■

Georgia Tech and the Medical College of Georgia have begun a biomedical research partnership. *For details, see page 6.*

■

Nile Hartman gets an ATDC research commercialization grant to develop his integrated optic biosensor for real-time immunoassay. *See page 7.*

■

GTRI hosts a successful Carnahan international security technology conference. *Details are on page 7.*

■

A retrospective look at recent retiree Fred Dixon's 41-year career at Georgia Tech is *on page 8.*

Georgia Tech
RESEARCH INSTITUTE

News & Notes

GTRI is forging ahead with its search for a new director, efforts to diversify its research sponsor base, and OOD restructuring for better management.

GTRI Meetings

From page 1

was cut in half, but basic equipment needs must be met. The amount allocated to overruns and cost sharing is larger than in FY92 because the increased emphasis on non-DoD work is resulting in more cost sharing contracts.

Lab highlights

Major accomplishments and human interest items from the various research labs and service groups constituted the next part of the program. They ranged, for example, from development of a new technique for flameless plasma spraying of organic substances on military equipment (MSTL) to development of animated geographical presentations for TBS's Jason educational project (EOPSL); from opening a new five-person technical office at Rosslyn, Virginia, (CAL) to opening one of only two OSHA university educational centers on campus (ESTL); from developing a 3-D surface modeler (MAL) to continuing progress on the largest single radar program in Georgia Tech history (TSDL); and from helping an industrial firm with a health and safety emergency (ESTL) to refurbishing the Cobb County Research Facility (FMD).

Questions & answers

OOD staff then answered questions submitted in writing in advance of the meeting, grouped by categories. They included GTRI's future in relation to Georgia Tech, the recent realignment of OOD, the search for a new GTRI Director, personnel "layoffs," OOD size and overhead distribution, degree of success in getting non-DoD work, the need for promotion guidelines for classified personnel, implementation and updating of the GTRI Strategic Plan, accountability for lab directors, and a request for specified coffee breaks. Some of the highlights are presented below.

• **GTRI/Georgia Tech:** Special Assistant to the President Gary Poehlein stated that there are no plans to merge GTRI with Georgia Tech or to sever its affiliation with the university. He does expect increased cooperation between GTRI and the academic units.

• **Director Search:** Charlie Brown reported that Gary Poehlein chairs the GTRI Director Search Committee; members are Charlie Brown, John Nemeth, and Roger Webb (EE). They have had over 100 applications so far, and have interviewed two internal and three external candidates. They expect to complete their search in October and recommend three candidates from whom the President will make the final decision. Dr. Grace has agreed to help with the transition, then retire.

• **Layoffs:** "There are no plans for major layoffs," Charlie Brown said, adding that "we intend to grow over the years." He stressed, however, that we are in an uncertain market right now, with soft areas and problems such as evaporating contracts. Since job "tenure" is based on contract support, OOD tries to place individuals who lose their customary support on other programs. "We try to find a capabilities fit among *all* labs—not just the person's own lab," Brown emphasized. The lab structure has been strengthened by restructuring from 21 to 18 labs, with a corresponding decrease from four lab group directors to three. And when employees in the labs or support groups are lost by attrition, they generally are not replaced.

The crowd assembles in the Cobb County Research Facility auditorium for one of the GTRI—Present and Future meetings. (Photo by Anita Edwards)

Dr. Grace added that OOD has appointed a task force, consisting of the lab group directors plus Bill Cooke, to do a study and set up guidelines for dealing with individual cases where people are displaced. He pointed out that OOD and lab funds are being spent on contract development in an attempt to get away from DoD dependence. He stressed, "It's incumbent on each of us to see that we have as many options as we can."

• **Non-DoD Work:** Jerry Carey said we can't back off on our contract development efforts with the Department of Defense. "It's still our largest sponsor," he said, "and although the military is reducing its acquisition of systems, this doesn't necessarily include R&D." He pointed out that GTRI is focusing heavily on testing, and Georgia Tech is trying to become a national center for test and evaluation. Carey added that one of the reasons for consolidating the labs into three groups was that changed world circumstances gave an opportunity to merge the threat group with the other elements of radar technology. "With the downfall of the Soviet Union, the threats to be faced by the U.S. have been more closely identified as "Rainbow," that is, Red (Soviet), Blue (U.S.), and Gray (Third World)," he said.

"It's a difficult challenge to diversify our sponsor base with the limited amount of discretionary funds that we have," Carey said. The Program Development Office is funding two major efforts: $500,000 to provide 60% funding for the on-site field offices and another $350,000 spread among the Program Area Development Councils (PADCs). GTRI is hampered by lack of new funds for internal research; the STGC is limited to $104,000 left over from last year, he said. "We are trying to get large IQCs (indefinite quantity contracts) and leverage them as much as possible," he stated.

Don Wilmot reported that the PADCs have been looking into the following research areas: transportation, telecommunications, Federal Aviation Administration, NASA, manufacturing technology, medical electronics, and energy and the environment.

• **OOD Realignment:** A memo outlining the recent OOD restructuring was distributed to all employees attending the meetings. (For an overview and listing of new laboratory groups, see the September GTRI Connector; for a list of members of the new OOD councils, see the *OOD Councils* box in this issue.) Dr. Grace said he and Bob Shackelford met with the lab directors individually and in a group prior to the restructuring so that they might express their concerns. ❑

OOD Councils

Lab Operations Council
C.E. Brown*
F.L. Cain
G.J. Carey
P.J. O'Hare
E.K. Reedy*
D.W. Wilmot*
R.G. Shackelford (ex officio)
Laboratory directors
*Rotating chair

Executive Council
R.G. Shackelford (chair)
C.E. Brown
G.J. Carey
D.G. Crowe
P.J. O'Hare
E.K. Reedy
D.W. Wilmot
D.J. Grace (ex officio)

Strategic Initiatives Council
D.G. Crowe (chair)
C.E. Brown
G.J. Carey
E.K. Reedy
D.W. Wilmot
R.G. Shackelford (ex officio)
Laboratory directors

Program Development Council
G.J. Carey (chair)
C.E. Brown
D.G. Crowe
E.K. Reedy
D.W. Wilmot
Laboratory directors

Academic Liaison Office
D.G. Crowe (chair)
K.K. Ahuja
M.N. Cohen
R.S. Hyde
J.G. Meadors
J.C. Nemeth
H.G. Paris
M.A. Richards
C.J. Summers

Senior Technology Guidance Council
D.G. Crowe (chair)
K.K. Ahuja
C.W. Bayer
D.G. Bodnar
J.C. Handley
H.F. Engler
T.L. Starr
M.T. Tuley
L.J. Turbini (MARC)
C.M. Verber (EE)
P.H. Wine

Cogswell award presented at campus ceremony

Regional officials of the Defense Investigative Service (DIS) came to the campus September 29 to present the coveted Cogswell Award for excellence in industrial security to Georgia Tech. DIS Regional Director Joanne Turner presented the plaque, which was accepted by President John Patrick Crecine.

According to Steve Lewis, the director of industrial security at DIS, the Cogswell Award is named for an Air Force colonel who, in 1965, became the first chief of a unified industrial security program for the United States. The program has had the same criteria for the 26 years of its existence, including management support for a facility's industrial security program, inspections indicating that employees are educated and motivated to carry out security measures, and the knowledge and professionalism of the chief security officer.

Georgia Tech was nominated by DIS Field Chief Virgil Hill, who, in the course of many inspections as Tech's field representative, became convinced that Tech's education program does "reach out and touch the employee."

In making the award, Ms. Turner stressed that this year only 42 of the nearly 12,000 cleared facilities (fewer than one-half of 1%) received this recognition. The national director of DIS, John F. Donnelly, makes the awards with the concurrence of the Secretary of Defense, she said. "As a reward," Ms. Turner announced, "you won't be inspected for another 12 months. We are confident that you have systems that will continue without inspection."

Dr. Crecine said: "Bob Lang has done a splendid job not only in keeping national security concerns uppermost in our minds, but in doing so in an unobtrusive way. Unobtrusiveness is important for a university, where openness and freedom of information are traditional values. This award shows that relatively unobtrusive security measures, backed by a solid program, can yield exceptional results."

GTRI Director Donald Grace added: "We appreciate the full backing of President Crecine—that's one of the reasons we accomplished this. Part of the trick is to maintain our security posture while allowing for foreign visitors and uncleared people who are wandering through the university."

GTRI Associate Director for Services Pat O'Hare commented: "Our size and diversity make this award particularly significant for me. Of the 42 winners, we are by far the largest and most complex organization to win the award."

Dr. Crecine summed it up: "The true credit lies with those who work in, and are mindful of, the need for security in much of the research we do. The credit also goes to Bob Lang and his staff for helping to create an environment where security is valued, and proper precautions are always taken."

As for Lang, he simply said, "This is the start—not the end. We're going to accomplish even greater things in the future." ❑

This is the Research Security team that led the Georgia Tech effort to win the Cogswell Award. Left to right: Paula Wilcox, Deborah Thomas, President J.P. Crecine, Richard Tofani, Bob Lang (holding plaque), Ida Taplin, Alice Woods, Vernell Stewart, Jennifer Tate, Ray Kangas. Missing: Ed Gilmore, Enoch Gamble, Rosser Jones, Charna Irvin, Phyllis Christopher. (Photo by Gary Meek)

Spotlight on Internal Research

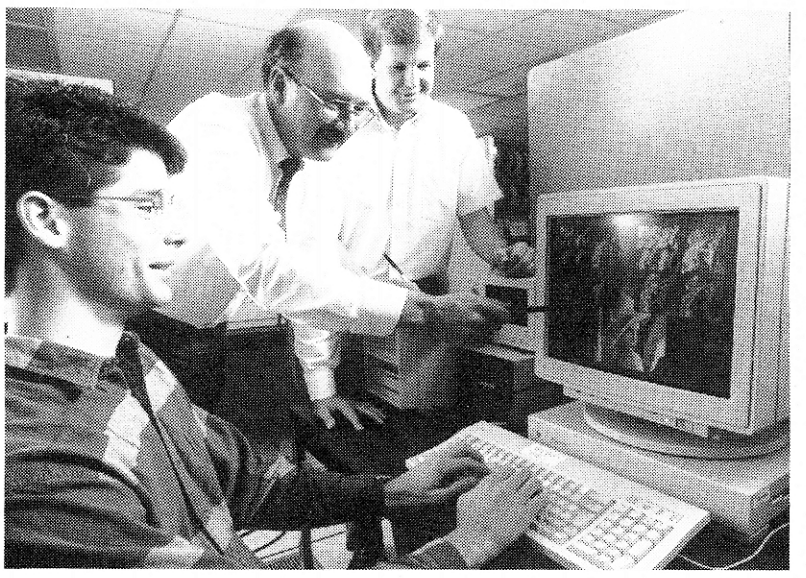
This is the sixth in a series of articles reporting on projects funded by GTRI's Senior Technology Guidance Council (STGC).

GTRI researchers explore uses for wavelets as their popularity grows

By Lea McLees, RCO

Wavelets, a group of mathematical formulas that appear wave-like in nature when graphed, existed as curiosities for years before signal processing experts discovered their utility as an alternative processing method.

Now, many people in the signal processing field are embracing wavelets just as their predecessors embraced the work of Jean Baptiste Joseph Fourier in the early part of this century. Among the modern-day enthusiasts is Dr. Jeff Holder, senior research scientist in the Modeling and Analysis Lab (MAL). He is completing work financed by an STGC grant to explore potential applications for wavelets.



These MAL researchers are using wavelets, a group of mathematical formulas that appear wave-like in nature when graphed, in image compression. Left to right, co-op Clint Parker (seated), Jeff Holder, and Chris Barnes. (Photo by Gary Meek)

"Even though people were aware of wavelets, they weren't used because it took forever to compute them," Holder explained. "Then a researcher at Bell Labs came up with a class of wavelets that are lightning fast. Now people are starting to get interested."

Wavelets are used to determine the characteristics of signals, which are sounds, images or messages transmitted or received by telegraph, telephone, radio, television or radar. The two most commonly used characteristics of signals are the time within which they occur and their frequency, or how often they repeat themselves during that period.

Researchers and signal processors extract time and frequency information by matching signals to mathematical equations that, if graphed on a sheet of paper, form patterns similar to those the signals form. The patterns are usually single lines that zip up and down through a series of peaks and valleys—the printout of earthquake vibrations made by sophisticated recording instruments, for example. If certain aspects of a signal pattern match a formula's pattern, the signal processor knows the signal's frequency or time will be similar to the formula's frequency or time.

However, the mathematical formulas usually used, such as sine and cosine, are different from signals in a potentially problematic way. Formulas form uniform, infinite patterns. Most signals, on the other hand, form irregular, finite patterns, Holder explains.

Wavelets, like signals, also exist for a finite amount of time and form irregular, very specific patterns that can be matched more closely to signal patterns, he notes. They thus hold potential for providing even more accurate information about signals than traditional formulas.

Wavelets hold potential for providing even more accurate information about signals than traditional formulas.

Holder has been applying standard wavelets found in scientific literature to the study of a variety of signals, including seismic activity, sonar data collected by a submarine, brain activity, and radar data on helicopters.

"Everywhere that I saw signals and people who were generating signals, I tried to collect data," he says. "I talked to people about the problems they had and what they were trying to do. Then I collected their data, processed it and sent it back to them."

He has generally found that wavelets provide more specific information about signals processed; one might even use wavelets to learn from the sound created by a gun blast which type of gun made the noise, Holder says.

Holder and colleagues Dr. Chris Barnes (MAL), Dr. Jim McClellan (EE), Lou Fertig

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Profile & Insight

Program puts junior researchers on fast track

By Martha Ann Stegar, RCO

GTRI's Mentee/Mentor Program has proven its worth in its first two years of operation. The program pairs promising, relatively new young staff members with experienced researchers who guide them in their contract development activities.

Bob Zimmer, who directs the program out of GTRI's Program Development Office, finds it exciting to see the growth in maturity of the mentees during the year. They have met quarterly to compare notes and share insights and experiences with each other, building strong rapport in the process. In fact, the mentees have found these meetings so valuable, they have recommended that the meetings be held monthly to allow more opportunity for training, a suggestion that Zimmer is implementing this year.

Carol Foley says her fellow mentees were like a support group. "When you start doing contract development, it's frustrating," she says. "You don't have a track record with sponsors, so you have to sell yourself as well as GTRI. You feel better when you discover that the others are going through the same frustrations you are."

Program benefits

"Going through the program gives you confidence!" says Marilyn Smith.

"Without the program, I wouldn't have the confidence to pursue contract development," Mike Cooper adds. He liked learning the process by doing. "It would have taken me many years to learn what I learned in this program, " he says. "There's definitely an accelerated learning curve!"

"The program gives you the tools you need—lets you experience the different phases of contract development," Preston Bates says.

Martha Willis feels the most positive part of the program in general is the dedication of time and money to do contract development. Each mentee received $5,000 to cover personal services and $3,000 for travel; the laboratory was expected to support the mentor. "This is a luxury that doesn't usually exist," she comments. "One generally has to steal time from one's regular work. But the program is only as good as people make it," she cautions. "You must want to do it, and learn to do the best job you can.

"Without the program, I wouldn't have the confidence to pursue contract development. It would have taken me many years to learn what I learned in this program. There's definitely an accelerated learning curve!"
— Mike Cooper (Mentee)

Former mentor Bob Englar and mentee Marilyn Smith still work together on projects. (Photo by Anita Edwards)

The FY93 mentees pause for a group picture at one of their monthly lunch meetings at Cobb County. Left to right, they are Ted Courtney, Fred McKeen, Dan LaGesse, Glen Hopkins, Don Strausberger, Kelly Denny, Martin Mannion, and Clarke Stevens. Not pictured: Jill Butterfield Gostin and Laurie Hodges. (Photo by Anita Edwards)

Nobody comes up with ideas just because they're in the program."

Since Scott Bostater had very little marketing experience, he and his mentor (Sam Piper) decided to concentrate on the skills needed to generate a proposal, including preparing and presenting GTRI/lab capabilities to prospective sponsors, responding to 'sources sought' requests, and in general, going through the competitive bid cycle.

"The mentee gets to do things he otherwise wouldn't get to do," Piper says. "For instance, Scott did a 200-page sources sought for a radar ECCM flight test demonstration/vulnerability assessment. He had to learn how to get information about capabilities in other GTRI labs as well as Georgia Tech as a whole. The best way to learn what's needed and how to go about it is to go through the experience."

Piper further comments: "It's a good idea to overtly invest in training our people. I wish the mentee program could be more widely applied in GTRI." He feels it's important to preserve the flexibility built into the program. "Each lab does business differently, and that diversity makes a relatively unstructured program desirable," he says.

Mentee/mentor relationship

Not the least of the program's benefits is the relationship established between mentee and mentor. As mentor Marvin Cohen put it: "Byron Keel, my mentee, picked up some of the rudiments of program development and was exposed to potential sponsors and the researcher-sponsor milieu. However, perhaps the most important and enduring result is the strengthening of interpersonal relationships between senior and junior researchers and the establishment of a basis for continued joint efforts and interactions."

Tom Pratt describes his experience: "David (Flowers) approached his responsibility as a mentor by trying to include me in everything that might help me develop professionally. This included conducting numerous conference telephone conversations, informing me of his professional activities, discussing technical issues with me, inviting me to meetings, and involving me in some way in almost all of his contract development efforts. This approach was a bit more comprehensive than the program guidelines called for and may not work well for all teams, but David and I interact almost on a daily basis, and this sort of mentor/mentee relationship seemed to be very natural."

"Bob (Englar) taught me to be a team player—to pass on contacts to help someone else," Marilyn Smith says. She and Englar continue as a team. "He does experimental fluid dynamics, and I do computational, so our work dovetails," she explains. "We've done three projects together since last summer."

Lessons learned

Carol Foley says one of her most valuable experiences was the opportunity to talk to people at her level throughout GTRI, to learn how contract development is done in other labs. She picked up tips on how to schedule time for contract development and how to do cold calling. It also helped her define her 'niche' and to identify potential collaborators.

Another helpful experience mentioned by several mentees was learning to do a sponsor-type briefing. Bob Zimmer plans to make this an integral part of the mentee program, with each mentee preparing a capabilities briefing and presenting it in a dry run for critique. Practice in writing a white paper or proposal also was recommended.

Several mentees got to work on large, multilab proposals, which they found to be a worthwhile learning experience. Martha Willis feels mentees should have the opportunity to see what it's like to work on a large proposal. Mike Cooper agrees and adds that they should work on both new and follow-on contracts. "All my projects that materialized were follow-on programs," he says.

The mentees also learned the difficulty of finding time to do contract development despite the pressure of deadlines on sponsored research work. Carol Foley says someone in her mentee group recommended taking small actions daily as a way to make progress, and she found that helpful. "You have to learn to budget your time," she says. Foley advises: "Treat the mentee budget as a contract that requires a 'scope of work' and a milestones/schedule."

Ron Alford learned that "contract development must be performed a little at a time—all the time," saying, for example, that "a few minutes organizing thoughts into an outline for a white paper can lead to dramatic results."

"Come prepared to meetings with sponsors," emphasizes Preston Bates. "At MSFC, I didn't bring literature describing GTRI and had to send it later. I also learned to cut the prepared briefing short to allow time for open discussion—getting to know the

FY93 mentee/mentor pairs selected

Following are the mentees, their mentors, and their fields of interest selected for FY93:

Mentee	Mentor	Area
Jill Butterfield Gostin	Martha Willis	Fractals
Ted Courtney	Dan Ortiz	Ergonomics
Kelly Denny	Terry Hilderbrand	Information systems
Laurie Hodges	Nick Faust	Computer graphics
Glenn Hopkins	Don Bodnar	Antenna technology
Dan LaGesse	John Daher	EMI materials
Martin Mannion	Dayton Adams	Intelligence analysis
Fred McKeen	Charlie Krebs	Multispectral devices
Clarke Stevens	Krish Ahuja	Acoustics/digital signal processing
Don Strausberger	Gene Greneker	Advanced highway concepts

sponsor's needs and bouncing ideas off one another."

Marilyn Smith says she learned how to deal with customers. "You can't just do shotgun visiting," she warns. "You must have a definite project in mind. And be careful how you phrase things—don't say things that would put prospective customers on their guard."

The bottom line

Several of the mentees have already succeeded in bringing in new contracts, although this was not necessarily expected within such a short time frame. Here are some examples:

Marilyn Smith (a FY91 mentee) says she and her mentor (Bob Englar) brought in two 'biggies' of over $100,000 apiece, with another $100,000 contract likely. "This was especially welcome because the contract-getter with whom I usually worked quit last May. Without the mentee program I would have been without contracts."

As George McDougal's mentee, Mike Cooper was fortunate to work on the successful proposal to the Air Force for a large task ordering contract in the area of electronic combat test improvement. He and another researcher compiled and correlated related work experience information from the different labs involved in the proposal, then he worked with McDougal on a multilab capabilities statement.

Tom Pratt and David Flowers brought in a $70,000 contract with potential for annual awards on the same order. Tom reports: "I was involved in this effort from the initial contact stages through to our recent response to proposal, which has been approved by their technical representatives. My personal involvement included discussing and suggesting potential analysis tasks, writing a task description and a cost estimate, working out details of the analysis, working with the potential sponsor to ensure we would meet his needs, working out mutually agreeable cost and time schedules, and finally working with OCA personnel from PID."

Among the FY92 crop of mentees, Preston Bates participated in several successes. Warner Robins ALC is funding in FY93 $1.2 million of a damage tolerance analysis (DTA) proposal he wrote last year that involves teaming with the Aerospace School and Sikorsky Aircraft. He also successfully sold Marshall Space Flight Center on the Aerospace Lab's capability to do DTA of large composite space structures. "I put together a capabilities/proposed tasks briefing and 'soloed' the marketing effort," he says. "This was an invaluable experience for me since I did all the work myself."

Carol Foley collaborated with Mike Elliott of the College of Architecture on a proposal to the EPA/Hazardous Substances Research Center that was funded for $40,000. They will study the decision-making processes in industries that have successfully implemented technologies or techniques that have reduced pollution at the source. "We'll use the results of this study to develop new programs at Georgia Tech to help industries implement new technologies," Foley says.

Thoughts for the future

In addition to group meetings, each mentee sends an informal monthly report to Zimmer via PROFS. He, in turn, keeps them informed about insights and opportunities in program development. The 'old' mentees stay on the distribution list as well—to aid them in their continuing contract development efforts.

Ten mentees were trained the first year, eight the second year, and this year the total has gone back up to ten. The program also has gone full circle: Martha Willis, who was in the first group of mentees, is currently a mentor. Her goal is to involve her mentee, Jill Butterfield Gostin, in all aspects of contract development.

Although to date the mentee/mentor pairs have been in the same lab, Zimmer says he'd like to see cross-lab cooperation in order to attack integrated markets. He'd also like to see mentee/mentor teams in addition to those funded by OOD working throughout GTRI. ❑

SQUIRE at your service

The Center for International Standards and Quality (CISQ) has launched its new information service called SQUIRE—Standards and Quality Information Retrieval for Exporters. It will enable southeastern firms to quickly obtain the latest information about European Community and international standards-related issues.

Relying on a mix of electronic data retrieval, printed materials, and fax transmission, SQUIRE also can identify sources for purchasing copies of foreign standards and can help firms access resources of federal agencies operating export-related programs.

A $500 annual subscription offers, among other things, (1) three hours of no-cost information research services, (2) a 40% discount on the cost of additional services, (3) automatic updating of standards and quality information for specific products, and (4) priority handling on all services. This compares with one-time information requests from nonmember companies, where the cost is $125 per research hour.

EDL's Holly Lawe directs the new service, which is an integral part of CISQ's technical assistance, training, and research efforts.

— *Lincoln Bates*

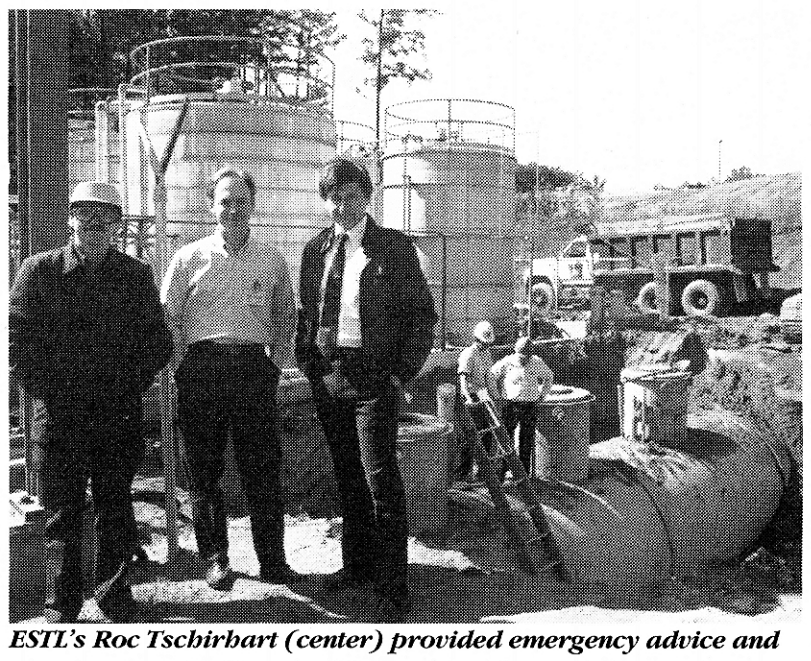
Roc to the rescue!

The Environmental Science and Technology Lab (ESTL) gets numerous calls from industry for all types of assistance. Here's how ESTL provided help to one company in an emergency over the Fourth of July weekend:

Roc Tschirhart received a desperate call for help from Terry Hall, factory manager of LioChem, Inc. Lightning struck an underground storage tank containing solvent at LioChem on July 2, causing an explosion that ruptured the chambers separating the two chemicals. Hall, who had taken ESTL's Leaking Underground Storage Tanks Corrective Action Alternatives seminar, immediately referred to the manual from that course for guidance.

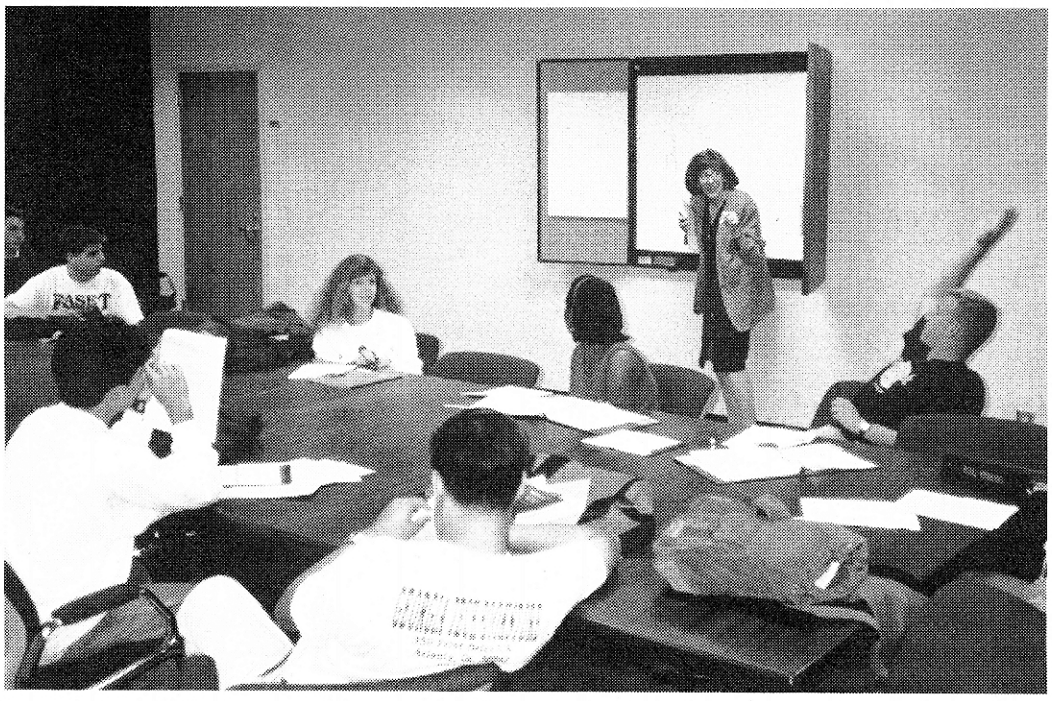
In his thank-you letter to Roc, he says: "In my notes, I had written your name down as someone to talk to for advice if we ever had a serious problem.... I knew it was very late at night and the beginning of the July 4th holiday, but, out of desperation for someone to talk to, I called you. You responded in a very professional and extremely friendly manner. You coached me through the situation and explained everything to me. Your advice was tremendously valuable, and I could never thank you enough for your help. It was such a relief and pleasure to be reassured that I was doing the right things and that everything was going to be okay."

Because of the holiday, Hall was unable to reach the Environmental Protection Division of the Georgia Department of Natural Resources until the following Monday morning, but, with Roc's help, the emergency was controlled without further incident. ❑



ESTL's Roc Tschirhart (center) provided emergency advice and support over the Fourth of July weekend to an ink manufacturing plant where lightning had struck an underground storage tank, causing an explosion. He is shown with the LioChem factory manager, Terry Hall (left), and George Watkins (right), the contractor whose crew replaced the damaged tank. (Photo by Rae Adams)

News & Notes



Lea McLees, RCO, is one of several GTRI staff members who are teaching Georgia Tech freshmen survival skills in the new Psych 1010 class. (Photo by Lee Hughey)

Staff members teach Tech freshman lab

By Lee Hughey, RCO

Several GTRI staff members are serving as lab instructors for an unusual first-quarter freshman course, Psychology 1010: The Psychology of Adjustment to College Life. The topic is "survival skills," or how to get through college, in general, and Georgia Tech, in particular.

The group volunteered when Pat O'Hare of OOD and Bill Osher of the School of Psychology requested their help. Those who planned Psychology 1010 had decided that entering freshmen could benefit from contact with lab instructors who had developed their own survival skills.

The stated purpose of the course is "to make each person a better student and a stronger job candidate upon graduation." What better way to do this than by using instructors who have been through college, entered the world of work, and are successful in their chosen fields? In this manner, they are bringing practical knowledge into the laboratory setting.

What better way to make each freshman a better student and a stronger job candidate upon graduation than by using instructors who have been through college, entered the world of work, and are successful in their chosen fields?

The participating GTRI staff members are Rich Combes, OOD; Martha Farley (substitute), SSD; Mark Hodges, RCO; Bill Howard, OOD; Janet Leininger, CSIT; Jerry Lett, MAPS; Lea McLees, RCO; Pat O'Hare, OOD; Cynthia Rogers, MAPS; and Paul Schlumper, ESTL.

The GTRI instructors met in September with other campus personnel, also selected for lab assignments, to learn how to work with students in this orientation class. Among the areas they will help address in Psychology 1010 are strengthening academic skills, developing organizational skills, clarifying career goals, getting to know campus resources, learning about the job search process, acquiring basic psychological concepts relating to young adult development and stress management, working effectively as a team member, refining communications skills in a business environment, increasing motivation to achieve, promoting a lifelong love of learning, and becoming familiar with Total Quality Management.

The course began September 23 and extends through November 30 of the fall quarter. Labs are one hour per week. The instructors also meet once a week with the lecture professors to discuss their experiences from the previous class and preview the upcoming class topic. Our people must commit some of their own time in order to be ready for each lab, so this is a real test of their own organization, time management, and communication skills.

Students are the targeted beneficiaries of this arrangement, but our own colleagues are getting something back as well: the experience of watching college students mature into young adults who will be better prepared for their own careers.

For many of the GTRI instructors, this is a first—teaching and working with college freshmen. It is a real departure from their regular duties. Early reports from several of them are that they are enjoying their "new" careers as instructors, but that there is a lot of preparation and it's a lot more work than they expected.

Says Lea McLees, "I have added respect for people who teach professionally."

"I think students who have taken this course are going to be far better off. I know I have learned from it, too," Bill Howard comments.

Cynthia Rogers remarks, "I wish I had had the opportunity to take this course when I was a freshman at Georgia Tech."

And Mark Hodges says, "There's a great deal of material to cover in these labs, and it's hard to keep the classes on track. But I enjoy working with the students and hope they can learn some of the tricks of success in college." ❑

Wavelets

From page 3

(CMDL), and co-op student Clint Parker have been using wavelets in image compression as well. They extract the minimum amount of data from a photo so it can be transmitted through telephone lines and reproduced accurately.

Among the results of this research is work that Fertig is using in his dissertation. Holder and Barnes are currently writing a paper about Barnes' image compression work with wavelets. In addition, Holder has been asked by other researchers to share his information with their labs, and is preparing a presentation on wavelets for the Atlanta chapter of the Aerospace and Electronic Systems Society. ❑

Georgia Tech and Medical College of Georgia: Partners in biomedical research

By Lea McLees, RCO

Biomedical research in Georgia is getting the benefit of both the engineering and medical worlds through a joint research program just begun by the Georgia Institute of Technology and the Medical College of Georgia (MCG).

The program, details of which were finalized September 28 at the Governor's First Annual Conference on Science and Technology Development, provides initial funding for biomedical research projects involving faculty from both Georgia Tech in Atlanta and MCG in Augusta, according to Jim. Toler, Tech's co-director for the program.

"Out of this collaboration should come improved medical procedures, better understanding of disease processes, and developments that will enhance national health care delivery," says Toler. He is also co-director of Georgia Tech's Bioengineering Center.

Each university contributed $240,000 toward funding 14 one-year seed grants for research proposed by faculty members. Research topics funded include everything from a multimedia-based computer simulation that surgeons can use in preparation for eye surgery to a study of the performance of new artificial heart valve designs. Officials believe the research will provide faculty members the preliminary results they need to win multi-year biomedical research grants or contracts from foundations, industry and government agencies in the future.

Advancing technology has made the combination of engineering and medical science a necessity, Toler says. "Medical instrumentation and procedures increasingly involve diagnostic and therapeutic devices that are engineering in nature," he explains. "As the number of such devices used in health care delivery increases, there is a corresponding need for an increase in engineers working with medical professionals."

Researchers from both universities had collaborated in small, informal groups for the past 15 years, according to Toler. The creation of the joint program just formalizes such associations and lends them important institutional and financial support.

Among the other coordinated efforts expected to result from this program are the exchange of faculty members and students, joint fund-raising efforts, and co-sponsorship of seminars, workshops and conferences.

The two universities hope to organize a national telemedicine conference in 1993. The development of telemedicine will allow information about a patient in a rural area to be transmitted electronically to a doctor in an urban area, who could then prescribe treatment. Such a service capability would increase the quality of health care provided to rural residents, without requiring them to travel to medical centers in cities that may be hundreds of miles away.

Collaborative health-oriented research programs between engineering universities and medical schools, although needed, are scarce. Fewer than six such programs exist around the country. MCG currently has 747 full- and part-time faculty members, all of whom could participate in the new program. About 33 to 35 faculty and staff members at Georgia Tech have a strong interest

in bioengineering and are candidates for participation, as well.

Georgia Tech and Emory University formed a similar research partnership, the Emory/Georgia Tech Biomedical Center, about five years ago. That center has been highly successful in increasing research collaboration and in winning funding for cutting-edge research projects. To date, approximately 60 seed grants have been funded through the Emory/Georgia Tech center. ❑

GTRI's Hartman wins research commercialization award

Nile Hartman (EOPSL) has won one of three research commercialization grants given by the Advanced Technology Development Center (ATDC).

The Faculty Research Commercialization Program began as a pilot project for Georgia Tech in FY92 to bring high-tech concepts from the university research laboratory to commercial product realization. It was expanded this year to a statewide demonstration project, with research faculty from all six member universities of the Georgia Research Alliance eligible for these awards.

Hartman's project involves development of an integrated optic biosensor for real-time immunoassay. The biosensor uses molecular recognition/binding as the detection element and a proprietary, integrated optical interferometer as the transducer. The unique design of the interferometer minimizes thermo-mechanical noise to provide a highly stable platform for detecting very low concentrations of specific biomolecules, chemicals, or microorganisms in either aqueous or gaseous environments. The approach relies on the detection of small refractive index changes in a thin surface film. When receptor molecules are immobilized on the surface of the interferometer, the subsequent binding of receptor conjugates results in a pronounced refractive index change.

Regents' Professor of Electrical Engineering Russell Mersereau received the second award. Researchers will design and develop a real-time speech and video encoder/decoder system that combines the features of a high-quality, low-bit-rate, full-color video coder with a high-quality, very-low-bit-rate speech coder. The target bit-rate for the combined video and speech will range from 19.2 kbps to 64 kbps for frames of size 352 x 288 at 10 frames per second. The real-time hardware environment will be based on a multi-processor configuration using Texas Instruments' TMS320 family of floating digital signal processors.

The third grant went to the Complex Carbohydrate Research Center at the University of Georgia, which is developing a management system for analytical laboratory information. The Analytical Chemical Object Verification System (ANCHOVY) will provide researchers with an integrated software environment capable of storing all research data in a database and analyzing and retrieving that data with a powerful search system.

The Faculty Research Commercialization Program provides critical business development assistance in market research and business planning. The ultimate goals are to form new companies around the products or license the technologies to existing companies. A formal awards presentation ceremony will be held in October. ❑

Professional Activities

Communications Lab

Eric Barnhart had an article in the August issue of *Atlanta Computer Currents* entitled "Georgia: Well-Positioned for the Telecommunications Revolution."

Concepts Analysis Lab

An invited paper by **Jim Cofer** (OOD) and **Sam Blankenship** on "Test and Evaluation at Georgia Institute of Technology" was published in the September *ITEA Journal.*

Countermeasures Development Lab

Tom Pratt and Mary Ann Ingram (EE) presented a poster paper, "Polarization Mode Dispersion Effects in Phase and Polarization Diversity Receivers," at the SPIE Optical Fibers Conference in Boston.

Economic Development Lab

On September 21, **Dale Atkins** gave a presentation on the Trade Adjustment Assistance Program at a conference of the North Carolina Society of Accountants.

David Swanson has been appointed one of three at-large member of the Technology Transfer Advisory Committee of Oak Ridge Associated Universities.

In late September, **Ed Lindsey** was successful in securing funding from the U.S. Department of Housing and Urban Development to provide technical assistance to the state's Community Development Block Grant program. The $185,000 HUD grant will be used to analyze the health of businesses located in CDBG areas and to provide appropriate assistance.

Carol Aton presented "ISO 9000: Barrier or Opportunity?" to the Society for Technical Communication September 16 in Atlanta.

Dennis Kelly and **Marvin Walker** recently gave a Georgia Power-sponsored seminar for industry on ISO 9000.

David Swanson testified September 29, via satellite, at a Congressional hearing on H.R. 5231 (the National Competitiveness Act), specifically addressing manufacturing extension services.

In October, EDL published *Developing an Existing Industry Program*, a guide for chambers of commerce and other economic development groups statewide that focus on retaining, nurturing and expanding local existing industries. Principal authors are **Ed Hardison** and **David Chatham**. Funding came through the EDA Center headed by **Art Brown**.

Electro-Optics & Physical Sciences Lab

An article by **Bill Livesay**, "GTRI Examines Computer Microcircuit Damage," appeared in the October issue of *Atlanta Computer Currents.*

Environmental Science & Technology Lab

On October 15, **John Nemeth** and **Krassi Paskaleva** made a presentation, "A Pollution Prevention Model: On-site Technical Assistance, Training, and Technology Transfer in Central and Eastern Europe," at the International Symposium on Environmental Contamination in Central and Eastern Europe held in Budapest, Hungary.

Materials Science & Technology Lab

Kathryn Logan has accepted a half-time appointment in the Office of Interdisciplinary Programs, where she is assisting in the general administration of OIP and with its interactions with the individual centers. Her particular areas of activity will be strategic planning, budget development, TQM coordination, and annual reporting. She is continuing her research program in MSTL.

Radar & Instrumentation Development Lab

Ted Lane and **Bill Holm** taught the 14th week of the Radar, MMW, and IR Applications to Munitions training course at Picatinny Arsenal (NJ) September 15-18. One more week, to be given in October, will complete the 15-month course.

Tracy Wallace gave a paper, "Performance of a 95 GHz TWT Amplifier with a Solid-State Modulator and High-Voltage Power Supply," October 21 at Wright-Patterson AFB (OH).

Research Operations Analysis & Modeling Group

Dennis Crain has passed his Certified Public Accountant (CPA) exam and will receive his certificate in February. Congratulations! ❑

GTRI hosts Carnahan Security Conference

The 26th Annual IEEE International Carnahan Conference on Security Technology was held October 14-16 at the Penta Hotel in Atlanta. GTRI hosted the conference, with Gene Greneker as conference chairman and a member of the Technical Program Committee and Mary Ann Burke as conference secretary. Burke, Jane (Mrs. Gene) Greneker, Bob Lang, Ed Reedy, and Whit Smith (EE) were on the Local Arrangements Committee.

GTRI organized the conference jointly with the IEEE Lexington Section and the IEEE Aerospace and Electronic Systems Society, in cooperation with the Swiss Federal Institute of Technology.

The annual conference is directed toward the research and development aspects of electronic security technology. It provides a basis for long-range support and assistance to authorities and agencies responsible for security, safety and law enforcement in the use of available and future technology.

GTRI people giving papers were as follows:

- "Radar as Part of a Netted Surveillance System—A Problem Revisited," Frank Williamson, Ralph Brooks, Gene Greneker, Nick Currie, Mel McGee, and Julia Ann Williamson
- "Remote Sensing of Personnel Badge Information Using Low-Cost Radar Sensors," Frank Williamson, Ralph Brooks, Lacey F. Moore, Julia Ann Williamson, and Mel McGee

Bob Lang gave a special presentation on Atlanta Olympics security. ❑

Mark your calendar!

You are invited to attend the 10th Annual GTRI Research Awards Presentation and Reception. It will be held in the Georgia Tech Theatre for the Arts on Thursday, December 3, from 3 to 5 p.m. See you there!

Focus on Folks

Focus on Folks

Fred Dixon retires

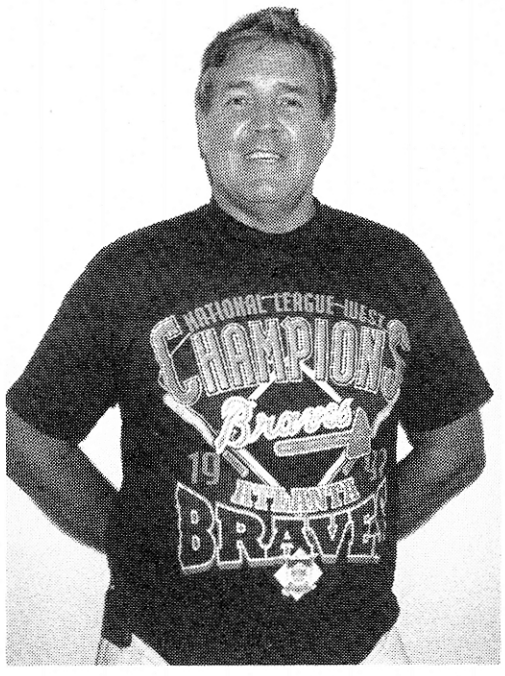
Principal Research Scientist Fred Dixon retired from the Threat Systems Development Laboratory August 31 after more than 41 years at Georgia Tech. He received his BS and MS degrees in physics from Tech and was employed as a research assistant here during the late 1940s. He was hired full time in 1951 and has been a major contributor to numerous projects at GTRI.

As head of the Defense Branch (1955-62) and the Special Problems Branch (1962-71), Dixon was responsible for buildup of R&D work on airborne electronic countermeasures, establishment of an analog computer facility for simulation analysis of torpedo and missile warfare problems, and supervision of specific studies on missile system reliability and checkout procedures, techniques for protection of ground radar networks against homing missiles, and countermeasures for advanced aerospace vehicles. As head of the Biomedical Instrumentation Group (1971-74), he provided engineering consultation and equipment development services on a variety of clinical research projects at the Emory University School of Medicine and elsewhere. He also served as interim associate director of Tech's Bioengineering Center from 1970-73.

In recent years, his work has included conducting environmental noise and air pollution studies at Hartsfield Atlanta Airport, managing engineering development of an experimental people-mover system, and managing systems engineering and fabrication of foreign threat radar simulators.

According to TSDL Director Joe Parks, "Fred performed an invaluable service as program administrator on the largest single research contract in Georgia Tech's history (a radar project), and his successful efforts on this program are a remarkable crowning achievement in his career. His dedication and devotion to Georgia Tech are superior to others I have encountered here, and he will be sorely missed."

Fred's friends wish him a happy retirement and thank him for his contributions to Georgia Tech. Fred is continuing on an hourly as needed basis. ❑



The GTRI Connector is published for Julian Price, mechanical technician in TSDL who supported the Braves to the bitter end, and all the employees of GTRI. (Photo by M.A. Stegar)

The *GTRI* Connector
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This publication is printed in part on recycled paper.

Clara Galleshaw, Nuclear Research and former GTRI, wears a "no PROFS" button and a "road sign" given out at the PROFS Withdrawal Seminar. The sign reads: "Caution. I am having PROFS Mail Syndrome." (Photo by M.A. Stegar)

More PROFS seminars coming up!

If you haven't already taken a PROFS Withdrawal Seminar, the Office of Information Technology (OIT) will offer 10 more sessions of the one-hour class in the next six weeks:

November
6 @ 10 a.m. and 3 p.m.
10 @ 2 p.m.
11 @ 10 a.m.
19 @ 10 a.m. and 3 p.m.

December
2 @ 10 a.m. and 3 p.m.
10 @ 10 a.m. and 3 p.m.

Seminars are held in 239 Rich Building. Call OIT at 894-4660 for reservations.

Calendar

College of Computing calendar

Here are November events at the College of Computing. Call Molly Croft at 853-2682 for details.

November 5—Scott Hudson, "What's the Only Advance in Programming Languages since Fortran: A Look at End-User Programming Systems," Graphics, Visualization, and Usability (GVU) Brown Bag Series, 12 noon, 102 Pettit Building.

November 6—Steve Pizer, University of North Carolina, "Image-Object Vision by Human and Computer," GVU Distinguished Lecture Series, 11 a.m., 102 Pettit.

November 12—Al Aho, "How Reliable Can We Make Software?" College of Computing (CoC) Distinguished Lecture Series, 17 CoC; reception 3:30 p.m., lecture 4 p.m.

Jay Bolter and Peter McGuire, "The Rhetoric of Multimedia," GVU Brown Bag Series, 12 noon, 102 Pettit.

Food for the hungry

GTOC volunteers, a member of the Olympic Force volunteer groups, will participate in the Share the Olympic Spirit Day by collecting non-perishable foods on campus and at Cobb County. The drive is November 1-18. Watch for the collection bins at your facility.

Personnel News

Aerospace Lab

Captain **Vince Ross** has joined AERO for a one-year Air Force assignment.

Computer Science & Information Technology Lab

Margaret Ray and **Joanne Nelson** are terminating.

Countermeasures Development Lab

New GRAs are **Anne Forrest**, Analysis and Test Group, and **Joe Jadamec**, Techniques Development Branch.

Environmental Science & Technology Lab

Richard Duplessis is a new safety engineering assistant in the Environmental Sciences Branch.

Microwave & Antenna Technology Development Lab

Glenda Powell has been promoted to senior administrative secretary.

Welcome to new employees **Michael D. Bridges**, graduate co-op, and **Mark A. Gillespie**, GRA. **Christopher Mertens**, GRA, has transferred to Physics.

Istvan Nogradi has transferred to RIDL, while **Waymon Reeves** and **Cynthia Milum** have terminated.

Office of the Director

Ginger Barr has joined OOD as a student assistant. She is a sophomore in textile engineering.

Signature Technology Lab

Welcome to the following: PRE **William Kreutel**, SRE **Bruce Glasgow**, RE II **Jeffrey Garnett**, and GRA **Mark Jones**.

Mike Wileman has transferred to EE, and **Leslie Leyes** has terminated.

Threat Systems Development Lab

William A. Poteat will be promoted to electronics engineer effective November 12.

John Estes has resigned. ❑

Personal Notes

Wedding Bells

Jill Butterfield (MAL) and **Lamar Gostin** (RIDL) were married October 3.

Cradle Roll

Diane and **Ken Johnson** (ESTL) welcomed a son, Samuel Bartlett, born September 30.

Volunteers

Fred McKeen (CMDL) spent Labor Day weekend in Homestead (FL) with a group from his church, helping to rebuild and repair houses.

Sick Bay

Trent Farill (MAL) is back at work after a short stay in the hospital. ❑