the GTRI connector

Published monthly for employees of the Georgia Tech Research Institute

Volume 6 Number 5 March 1990

GTRI Helps Attract Top Students to Georgia Tech

by Ginger Pinholster, RCO

Georgia Tech can no longer be described just as "that engineering school in Atlanta." Today, a statewide network of regional offices operating as part of GTRI "presents our face to communities throughout Georgia," says Dr. Norman Johnson, special assistant to the president.

The regional offices perform economic development work, and they also pull outstanding students into Georgia Tech's academic programs.

On March 3, for example, EDL's Economic Development Division coordinated a "Showcase" event to promote awareness of Georgia Tech's academic, research, and economic development programs. Several Showcases are planned each year, either on campus or at one of GTRI's 12 regional office locations.

During the most recent Showcase, 35 top students from Macon and surrounding areas—along with their parents and local community leaders—were able to meet with President John P. Crecine as well as other Georgia Tech officials. (They also had a chance to catch the Georgia Tech/Clemson game.)

"Showcase allows the students to interact with administrators and faculty while they get to see some of the campus," says Associate Vice President E. Jo Baker of the Office of Academic and Research Support. "One of the most important ways to attract good students is through personal contact."

Several Macon-area candidates for the Presidential Scholarship Program attended the March 3 Showcase. The regional offices help locate potential presidential scholars by working with local schools and conducting interviews with outstanding students, explains EDL Director David Clifton.

Other Programs

Another vehicle for attracting top students is the Graduate Research Assistantship (GRA) program. It allows outstanding students to work in world-class research facilities while advancing their education at Georgia Tech.

During the 1989 fall quarter, GTRI directed 108 GRAs and graduate co-op students. Roughly half of those students were supported by GTRI's Office of the Director, reports Associate Director James Wiltse.

"All of our new entry-level employees are required to be admissable to graduate school and to work toward advanced degrees," adds GTRI Director Donald Grace. "If they had gone into industry, they might never have continued their education—especially at Georgia Tech."

At GTRI, employees like Gene Greneker sometimes initiate informal recruitment programs. Greneker frequently invites local high school students to work in his Cobb County lab during spring or summer breaks. He and others also serve as judges at high school science fairs, and last year GTRI established an Engineering Excellence Award to be given at the State Science Fair in Athens.

Regional office employees are always prepared to answer students' questions, notes Economic Development Division Chief David Swanson. For example, in the Douglas Regional Office, Director Sherman Dudley advises students who have never met an engineer before. "Youngsters who aren't exposed to any adults in the scientific or technical fields don't have a sense of what people in those careers *do*," Dudley comments. "These students need our help in deciding where they can fit in."

During the March 3 Showcase, students like Ken Davis had a chance to meet Georgia Tech officials like President John P. Crecine, Macon Regional Office Director George Lee, and Dr. Norman Johnson (seated), special assistant to the president. *(Photo by Joe Schwartz)*

Crowe to Direct Internal Research

Spauschus to Retire

Dr. Hans Spauschus, GTRI's Director of Internal Research, has announced his retirement effective May 31. He came to GTRI in May 1980 to head the Materials and Chemical Sciences Laboratory, later renamed the Energy and Materials Sciences Laboratory when it merged with the former Energy Laboratory. In October 1988, he was tapped to direct GTRI's new thrust in internally funded research. He co-chaired, with Jim Gallagher, the Senior Technology Guidance Council, which to date has awarded $4.2 million of funds to 44 internal research initiatives.

GTRI Director Donald Grace commented: "We will miss Hans and the enthusiastic professionalism with which he approached all his assignments. After retiring from a distinguished career at General Electric, Hans gave GTRI ten years of dedicated service, and we wish him well as he begins a third career venture." Dr. Spauschus will begin taking extensive accrued vacation after March 31, and plans to establish a firm in Atlanta specializing in refrigeration science and technology.

Executive Associate Director Bob Shackelford said: "I will miss Hans personally as a colleague whose leadership, judgment and integrity could always be counted on. GTRI will miss the leadership and professional stature Hans has provided in an important technical area."

In a move to coordinate the internal research program with strategic planning, Dr. Devon Crowe, Director of the Electromagnetics Laboratory, will assume the responsibility for both functions under the new GTRI organization. In announcing his appointment, effective immediately, Dr. Grace said, "Devon has taken a leadership position in developing substantial research initiatives since joining GTRI, and has recently been involved as a principal in the formation of the Center for Optical Science and Engineering."

Restructuring News

As everyone knows by now, GTRI is undergoing a major restructuring effort. Many people throughout GTRI are currently involved in working groups that are looking at and making plans for changes in operational, administrative, programmatic, and support systems.

As the July 1 start date for implementation of the GTRI restructuring approaches, all of these parallel activities will require close coordination and systematic assessment to ensure that critical and mutually dependent activities are completed in a timely way. To facilitate the successful completion of these tasks, GTRI Executive Associate Director Bob Shackelford, who oversees the entire restructuring effort, has recruited EDL Associate Director Rich Combes to assist him in developing and maintaining a critical path schedule.

"Rich will be responsible for day-to-day schedule management to assure that major decisions and work systems are completed by July 1. He also will identify transition activities that will be required after July 1," Shackelford said.

Shackelford also announced that OOD soon will start publishing a newsletter to inform employees about various aspects of the restructuring plan and to bring them progress reports on the restructuring activities.

Probing the World of the Infinitesimal

by Martha Ann Stegar, RCO

Analysis of the microstructure of materials is a key component of many advanced research projects today, as scientists create new structural composites and synthetic materials, seek to improve the properties of existing materials, and strive for ever greater miniaturization and densification of electronic components. And EMSL's Materials Characterization Branch (MCB) plays a vital role in many of these studies.

"We have our fingers in a lot of pies, in a significant but not necessarily a principal way," says Branch Head Garth Freeman.

The Materials Characterization Branch staff gathers around Jim Hubbard at the microscope. Left to right, they are John Sparrow, Walter Forrister, Sheron Meyers, and (seated) Garth Freeman. *(Photo by Joe Schwartz)*

MCB Then and Now

"We're one of the oldest research groups on campus still in existence," Dr. Freeman adds. "EES (now GTRI) set up the first electron microscope in the Southeast in the late 1940s. For many years, we were primarily a service group, providing analytical instrumentation and services that were not otherwise available to industry. Now that many industries have their own analytical instrumentation capabilities, we are selling our problem-solving expertise and our ability to play a significant role in cutting-edge research. We still work with our industrial clients every day, but in recent years, the emphasis has shifted to cooperative research on a variety of materials-related projects."

For the first two decades of its existence, the electron microscopy group played a large role in the success of the Georgia kaolin industry, as analysis of the physical and chemical properties of kaolin was its predominant activity. Since then, the work has diversified tremendously. And they now use an array of analytical equipment to perform not only scanning electron microscopy and transmission electron microscopy, but also X-ray diffraction, optical microscopy, infrared spectroscopy, thermal analysis, and Auger and ESCA (electron spectroscopy for chemical analysis) surface analysis.

Industrial Services

The Materials Characterization Branch still operates as a cost center in performing analytical services for many businesses, primarily in Georgia and principally in the area of materials failure analysis. Some 20 to 40 clients are billed each month for services costing from $45 up. "This is mainly detective work on short-term problems," Freeman says, "and it brings in about $200,000 a year. However, we are deemphasizing purchase order work and shifting more toward sponsored research."

Among the branch's diverse array of clients are such prominent companies as du Pont, the F.B.I., Coca-Cola, Southwire, Bell Laboratories, TVA, Delta Air Lines, Rockwell International, and Hickson Corporation. They have examined microelectronic devices for Northern Telecom, Reliance Electric, Electromagnetic Sciences, OKI Telecon, and SCI Missile Guidance Systems. For Kimberly-Clark, they have analyzed surface characteristics of nonwoven fabrics, and for the Institute of Paper Science and Technology, the wettability of papers. They have characterized pigments used in the color reproduction (photocopying) process for Colorocs, and investigated battery plate corrosion for SAFT.

Major Research Activities

Staff members bring their broad background of characterization skills to bear on numerous research projects, not only in EMSL and GTRI, but also with academic colleagues, at both Georgia Tech and other institutions. Major research studies in GTRI in which they are cooperating are as follows:

Dr. Freeman directs an STGC-funded project, in cooperation with Tom Starr of EMSL, to examine ceramic composites in order to relate the microstructure at the interface where the matrix and fibers meet with the mechanical properties of the composite. For Jack Lackey (EMSL), he is characterizing thin films produced by chemical vapor deposition. They include diamond coatings for potential electronic and tribological applications, as well as films of superconducting materials deposited on flexible wire for magnet and motor windings.

For EMSL's Solar Thermal Applied Research Center, Freeman and Walter Forrister are characterizing new carbon fibers produced by solar radiation, a treatment that appears to significantly increase their oxidation resistance. Freeman also is working with Billy Livesay and Laura Turbini on interconnection technology research funded by the Manufacturing Research Center, with Livesay investigating mechanical properties of various solder materials and Freeman analyzing the microstructure of the solder. The goal is to develop materials consistent with the drive toward miniaturization of electronic packages.

Jim Hubbard, a widely recognized expert in asbestos analysis, is cooperating with Chris Papanicolopoulos of EDL to develop encapsulant materials and standards for testing encapsulants as an alternative to asbestos removal. He and Walter Forrister are investigating chemical treatment of *in situ* asbestos to make the fibers coagulate and render them safe. Under sponsorship from du Pont, he is looking at the Georgia Tech-patented thermite process as a means of destroying asbestos waste material.

John Sparrow is working with Kathryn Logan, also of EMSL, to understand the mechanisms of formation of titanium diboride in the self-propagating, high-temperature synthesis (thermite) process which she has developed. And he is working with Billy Livesay of EML on the problem of electromigration of metals in microelectronic devices.

Walter Forrister is currently assisting Dan Campbell (EML) with his STGC-funded nonlinear optics study for integrated optics devices and Jan Gooch (EMSL) with his work on new polymer materials. He also has been involved in studies on tailored reflectivity of surfaces.

MCB scientists also are assisting academic researchers in several Georgia Tech schools, including Biology, Earth and Atmospheric Sciences, Physics, Chemical Engineering, Civil Engineering, and Materials Engineering.

Rounding out the MCB staff are administrative secretary Sheron Meyers and about ten hourly student employees.

John Brown headed the materials characterization activity from 1963 until his retirement in 1984. Dr. Freeman replaced him in November of that year, coming from the Institute for Mining and Minerals Research in Lexington, Kentucky.

Late Deliverables Impact Research Awards

Warning to project directors: Late deliverables are unacceptable.

The federal government and some of its major prime contractors are taking a hard look at contractors who are delinquent at some time during their performance. The implication, according to Dave Hendrix, manager of OCA's Project Initiation Division, is that they may not be solicited for future work.

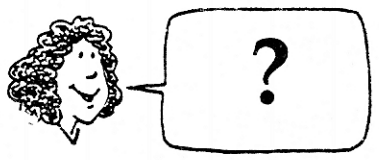
"The tardiness of just one research unit at Georgia Tech affects us all," Hendrix warns. "Since the government contracts with Georgia Tech, and not individual campus units, late deliverables by any project director or principal investigator can impact *all* of Tech's government-sponsored programs. For example, we have lost a U.S. Air Force project due to unrelated late deliverables, a Department of Defense sponsor is currently holding up payments on five projects until an overdue deliverable on one of the projects is furnished, and AFOSR has held up two awards pending receipt of unrelated deliverables. Additionally, a civilian government agency has informed us of its intent to block Georgia Tech from any awards for up to five years, due to late reports on an existing project."

GTRI Director Donald Grace has announced that the GTRI management is going to take a closer look at each deliverable and develop some tough measures for multiple offenders who don't have reasonable justification. "The matter is really serious, and our performance isn't getting that much better," he cautions.

Hendrix says some late deliverables go on record because some project directors misunderstand the proper procedures for making changes. "Under no circumstances is a government technical monitor or program manager authorized to alter the price, starting and ending dates, or deliverable requirements on a contract," he stresses. "Even with the technical monitor's permission to delay a report, the researcher will be officially delinquent unless he asks OCA's Program Administration Division (PAD) to obtain the government's approval of the change."

Another oversight involves certification of the printed deliverable schedule at the start of each new award. OCA requires that one copy of the schedule be signed and returned to PAD. If the researcher does not indicate that the list contains an error, he or she is "in effect promising to furnish every deliverable on the list on or before the date stated," he emphasizes.

QUESTIONS, ANYONE?



by Charles McCullough, HRD

I haven't been able to track down a list anywhere that tells me what Georgia Tech sports events my family and I can get into free by virtue of my being a member of the staff. I'm familiar with the rules about basketball tickets, but there are other sports I'm interested in, too.

The reason you've been unable to find a free-tickets eligibility list anywhere is that there hasn't been one. Up until now, that is. Here's all the information you might need about intercollegiate sports events here at Tech. If anybody is interested in intramural or club sports, let me know and I'll do a column on those sometime in the future.

Men's and Women's Track: Faculty and staff can get in free by showing a valid faculty/staff ID card. Most men's and women's track events are at no charge anyway, but for those that have an admission charge, admission will have to be paid for family of faculty or staff.

Men's Golf: Faculty, staff and their families can get in free upon presentation of a valid faculty/staff ID card.

Women's Basketball: Faculty, staff and family can get in free upon presentation of a valid faculty/staff ID.

Men's and Women's Cross Country: These are non-admission events. Just show up at whatever part of the country they're crossing and watch to your heart's content.

Men's and Women's Tennis: Faculty, staff and family can get in free upon presentation of a valid faculty/staff ID card.

Men's Baseball: Faculty and staff can get in free upon presentation of a valid faculty/staff ID card. If you wish to bring your family to a men's baseball event, call the Baseball Office at 894-5471 prior to the game(s) you will be attending and give them the names of your family members who will be attending with you. If you don't get their names added to the list provided to the gate, tickets for family will have to be purchased. If your 10 kids decide to tag along at the last minute, don't worry about devastating the household budget: tickets are only about $2 at the gate.

Women's Volleyball and Women's Softball: No charge.

Those of you who are especially astute might have made note of the frequent recurrence of the phrase "*valid* faculty/staff ID card." Before you go charging off to a game expecting to get in for free, take a minute to check the expiration date of your ID card. If your ID has expired, you can get a new, valid card made free in the Personnel Division's Records Section (2nd floor) Monday through Friday during regular business hours.

So far, getting into a sports event sounds really simple. That's because we've only addressed the "non-revenue sports." Once we get into the big bucks of men's football and men's basketball, it gets mighty complicated.

Men's Football: As a full-time, regular member of the faculty or staff, you can buy a maximum of two season tickets for home games at half price. This excludes away games. If you want to purchase tickets for just a single game, there is no discount, nor is there any discount for any of the away games. You must apply for football season tickets; the applications are mailed out about mid-March each year and should be in your hand by the time you're reading this column. This year's cost for two half-price season tickets: $108, which is for the six home games. Faculty and staff ticket holders get seats in the top eight rows of lower deck west, up under the overhang. You can upgrade your seating (for example, moving closer to the 50-yard line) by requesting an improvement, but a change in seating from one year to the next is dependent on the same priority system as described below in Men's Basketball.

Men's Basketball: If you are a full-time, regular member of the faculty or staff, you can buy a maximum of two half-price half-season tickets. The cost for two half-season tickets for the just-completed men's basketball season was $84. You must apply for these tickets via the basketball ticket applications that are mailed out in August of each year. Whether or not you get tickets is dependent on a complex priority system truly worthy of a scientific and engineering institution. The priority system takes into consideration your title, how long you've worked here, how many years you've been applying for and buying tickets, etc. Full-season tickets are rarer than hen's teeth, and only persons who have had full season tickets since the invention of dirt have managed to maintain their eligibility for tickets for the full season. No new applicants for full-season tickets are even being considered. Faculty and staff ticket holders are seated in Section 14.

Personnel Tip of the Month: If you're interested in participating in a healthy sporting event and helping out a worthy cause, be a member of the Georgia Tech/GTRI team that is participating in this year's March of Dimes Walk-A-Thon. The Walk-A-Thon will be on Saturday, 28 April. For more information on being a team member, contact LaVerne Spearman in GTRI Supply Services, 894-3440.

PROFESSIONAL ACTIVITIES

ECONOMIC DEVELOPMENT LAB

David Earnest of the Albany Regional Office received his MBA from Albany State College in December.

Gainesville Regional Office Director **Rick Duke** has earned designation as a Certified Industrial Developer.

In March, **Ron Bohlander** made two presentations: on quasi-optical devices at the short course on Advances in Millimeter Wave Applications and an overview of automated guided vehicles at the 40th annual Material Handling Short Course.

Charlene Bayer and **Chris Downing** took part in a case study panel discussion February 8 at Georgia Tech's annual Indoor Air Quality Symposium. They, plus **Doug Moore** and **Alan Pashkevich**, participated in February on a panel discussion at the Canadian Consulate on indoor air quality and energy conservation issues.

ENERGY & MATERIALS SCIENCES LAB

Kathryn Logan was invited by the National Science Foundation to participate in a workshop on the research needs in direct combustion synthesis, held February 20-21 in Washington (DC).

Jamie Burnette is coauthor of a paper recently published by NASA Langley entitled "A Proposed Computational Technique for Obtaining Hypersonic Air Data on a Sharp Nosed Vehicle."

In the book, *Pyrolysis and Gasification*, recently released by Elsevier Applied Science Publishers, **Dan O'Neil** is the author of a chapter on "Pyrolysis Case Studies" and coauthor with **Ray Kovac** of a chapter on "Entrained Flow Pyrolysis."

RADAR & INSTRUMENTATION LAB

In January, **Chris Barnes** presented a paper on "Necessary Conditions for the Optimality of Residual Vector Quantizers" at the International Symposium on Information Theory in San Diego (CA).

An article by **Marvin Cohen**, "An Introduction to Automatic Target Recognition," appears in the 1989-1990 *EW Design Engineer's Handbook.*

Nick Currie served on a proposal review panel for the U.S. Army ARDEC Wide Area Mine Program in early March.

RESEARCH SECURITY

Bob Lang has been appointed vice-chairman for the Government Security Committee of the American Society for Industrial Security.

SYSTEMS ENGINEERING LAB

Bud Sears, David Flowers, and **Jay Schlag** (EE) have developed a SECRET short course on Advanced Electronic Warfare Principles, at the request of the Association of Old Crows. The course has been presented in the Washington (DC) area, at White Sands (NM), Monterey (CA), and Fort Monmouth (NJ), and is scheduled for Eglin Air Force Base in March.

Mike Kelly's article, "Exploring the Human Factor in Apparel Manufacturing," is featured in the January issue of the *AMTC Quarterly*, the publication of Georgia Tech's Advanced Apparel Manufacturing Technology Center, and a paper on the same subject has been accepted for presentation at the International Conference on Advanced Manufacturing and Hybrid Automation, to be held in August in Honolulu (HI).

At a recent Senior Staff meeting, Don Grace awarded plaques of appreciation to four members of the original Senior Technology Guidance Council who have rotated off the board. Left to right: Chris Summers, John Nemeth, Dr. Grace, Dan O'Neil, and Chuck Ryan. *(Photo by Joe Schwartz)*

Dennis Folds' paper, "Advanced Audio Displays in Aerospace Systems: Technology Requirements and Expected Benefits," has been accepted for presentation at the NAECON '90 conference in Dayton (OH) in May.

Boasting new master's degrees from Georgia Tech are **Colin Field** (EE), **Dave Loftus** (Management), **Doug Olsen** (EE), and **Rob Raboud** (EE).

SYSTEMS & TECHNIQUES LAB

As a result of five papers delivered on various high-power modulator topics at the 1989 IEEE High Voltage Conference, **Istvan Nogradi** went to Washington (DC) January 8 as an invited expert consultant to the U.S. Coordinating Committee for the U.S. Department of Commerce and NATO on matters involving exportation of critical technology. The Technical Task Group responsible for "Technical Components" comprised representatives from the Department of Defense, State Department, Secretary of Defense, Department of Commerce, and other organizations.

Lynn Barton has received a letter of appreciation from the Commanding Officer, Attack Squadron 205, U.S. Navy, as a result of solving an unusual aerodynamic problem. Following a mishap with an A-7 aircraft, she was presented with a scatter diagram of aircraft fragments in hopes that she could help determine certain parameters of the flight of the aircraft prior to the mishap. The navy said her expert analysis allowed their investigators to reach important conclusions that will enhance the safety of future flight operations.

Human Relations Award Nominees Sought

The Office of the President has established the Georgia Tech Human Relations Award to reward members of the campus community who are engaged in exemplary human relations work. The Office of Human Relations has issued a call for nominations for the first annual award, with a deadline of April 2.

Nominees must be currently employed full time at Tech, have been continuously employed at Tech for the past three years, and have demonstrated outstanding human relations in both personal and professional activities. A broadly based Selection Committee, representing metro Atlanta and state human relations bodies, as well as Tech faculty, students, alumni, and administrative units dealing with the public, will be appointed to review nominations.

The award recipient and two runners-up will receive plaques during the annual spring honors program. A permanent plaque with the winner's name will be on display in a prominent place in the Student Center area. The winner also will receive a cash award. One fifth of the award will go directly to the winner, and the remaining amount will go as a scholarship to a Tech student who also has been exemplary in his or her human relations activities.

For more information or to obtain nomination forms, call Dr. Don Bratcher, director of the Office of Human Relations, or staff assistant Janice Whatley at 894-8337.

Research Slide Programs Available

The Research Communications Office (RCO) has produced new versions of the slide-tape program "Research at GTRI." The general program, an overview of research activities based on the GTRI Annual Report, runs about 26 minutes. It replaces the 30-minute program on laser disk, videotape and in slide-tape format. An electronics-oriented program runs 25 minutes, with the first 17 minutes presenting the introduction and electronics, followed by materials sciences and economic development/ industrial assistance. There also is a short version of the general program that is 15 minutes long. All three versions are expected to be available on videotape by mid-March. You can reserve and check out any of these programs by contacting RCO at 894-3444.

White Awareness Courses Offered

The Office of Human Relations will offer two "White Awareness: Understanding Racism" workshops spring quarter. Human Relations Director Don Bratcher will lead the programs.

The overall objectives are to help whites become aware of how racism affects their lives and to assist them in developing anti-racism strategies. According to Dr. Bratcher, "This program is designed to help white people become free of the perspectives that have trapped them in their view of themselves and in their interactions with other whites and with members of minority groups."

One course is scheduled each Tuesday and Thursday, April 10-May 10, 12-1 p.m. The other course is each Monday, April 16-May 7, 6-8 p.m. Locations will be announced. To register, call Janice Whatley at 894-8337.

PERSONNEL NEWS

ECONOMIC DEVELOPMENT LAB

Pat Tucker is the new administrative secretary in the Rome Regional Office.

David Earnest of the Albany Regional Office has resigned.

ELECTROMAGNETICS LAB

The write-up on Dr. **Daryl T. Lawton** last month was incorrect. Here are the correct details: Dr. Lawton is a senior research scientist in the Electro-Optics Division and an associate professor in the School of Information and Computer Science. His areas of research are computer vision, artificial intelligence, mobile robotics, educational software, and virtual realities. At EOD, he will be working on model-based recognition systems. He comes to Tech from Advanced Decision Systems in Mountain View (CA) and the University of Massachusetts at Amherst.

ENERGY & MATERIALS SCIENCES LAB

Stuart McLemore and **Ray Kovac** have terminated.

RADAR & INSTRUMENTATION LAB

Walter Horne is a new SRE in the Modeling and Analysis Division. He has his MSEE from Georgia Tech and worked in RAIL from 1980-1983 as a RE I.

The Radar Applications Division welcomes RE I **George Aboutanos**, who has his MSEE from Georgia Tech, and RS II **Aram Partizian**, who has a BA from Oberlin College.

Scott Parker transferred to Network Technologies in February.

Betty Pope has been promoted to administrative secretary.

SYSTEMS ENGINEERING LAB

Harold Engler was named employee of the month for October for his outstanding performance in presenting the highly visible and somewhat controversial topic of neural nets at the AOC National Convention.

Stephen Goodman is a new GRA in the Concepts Analysis Division. He is a PhD candidate in EE who is interested in artificial neural networks.

Jeff Jones and **Robert Yohman** have resigned.

SYSTEMS & TECHNIQUES LAB

Robert A. Moore, a senior research engineer who specialized in antenna development, retired February 16 after 24 years of service. He came to Tech in 1966.

Women's Club April Events

The Georgia Tech Faculty Women's Club will hold two events in April. Don Lillie, glassblower, will speak at 10 a.m. April 18, at the Faculty Club on North Avenue. The Spring Tour of Callaway Gardens will be April 25, 9 a.m.-4 p.m. Call Sandra Rousseau, 261-0319, for details.

Georgia Procurement Assistance Center Refunded

The Georgia Procurement Assistance Center, which lost its funding last September, recently was refunded and has resumed helping firms statewide sell their goods and services to the federal government. The center's funding for 1990 totals $145,000 from GTRI and a matching amount from Uncle Sam. According to GPAC Director Chuck Catlett, the center has assisted more than 600 companies since 1985, resulting in $28 million in contracts awarded and another $4 million in contracts pending.

PERSONAL NOTES

EDL: **Gayle Warren** has been selected by Kennesaw State College to be in *Who's Who Among Students in American Universities and Colleges.*

Jan Lewis was married to Raymond Holland in February.

RAIL: Congratulations to Ginnie and **Rob Roglin** on the birth of their son, Peter, February 8.

SEL: **Shawn Malone**'s mother passed away January 26.

STL: Congratulations to Janet and **Albert Vineyard** on the birth of Philip Michael January 3, to Theresa and **Derrick Bunting** on the birth of Nicholas Alexander February 17, and to Kathy and **Scott Gleason** on the birth of Katherine Bell February 22.

Our sympathy to **Dale Nordin** on the death of his mother February 24.

Terry Snipes has been inducted into the Blue Key National Honor Fraternity and Golden Key National Honor Society at Kennesaw State College.

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Published monthly for employees of the Georgia Tech Research Institute

Vol. 6 No. 5 **March 1990**

Published by the Research Communications Office, Centennial Research Building, Georgia Institute of Technology, Atlanta, GA 30332. Georgia Tech is a unit of the University System of Georgia. The deadline for submission of copy is the first Tuesday of each month.

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