

The GTRI Connector

Did You Know...

A duck will lay eggs only in the early morning.

The human eyes can perceive more than 1 million simultaneous visual impressions, and are able to discriminate among nearly 8 million gradations of color.

-- from *2210 Fascinating Facts* by David Louis

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Follows Strong FY 96

First Quarter Awards Looking Good

By Lea McLees, RCT

GTRI contract awards, expenditures and collaborative research for the first quarter of FY 97 showed a positive trend, says Director Richard Truly.

"We are close to record-setting levels, and we are doing well," he told employees attending EOEML's quarterly lab meeting on Oct. 22.

Total awards for July through September were \$26,673,832. September has been the best month so far, with researchers garnering \$11,223,602 in funding. As of late October, researchers had added another \$7.9 million in awards to the FY 97 total.

GTRI was responsible for 52 percent of sponsored monies that came to Georgia Tech through October. ELSYS is leading its fellow labs, having brought in just more than \$8 million in awards. SEAL and ITTL are close in second and third, respectively, with just more than \$4 million in awards thus far.

Collaborative work during the first quarter of FY 97 also is going well. GTRI has performed \$2.3 million in work with resident instruction researchers on campus. If that trend continues, about 10 percent of GTRI's contract work this year

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An exhibit of art by EOEML employees and their families was on display through November in Baker. You can still view several of the pictures during December in O'Keefe. Sheree Collins (EOEML) organized the exhibit. (Photo by Lea McLees)

Sitterle Named SDL Director

SDL will have a new lab director beginning in January 1997.



Jeff Sitterle

Senior research engineer Jeff Sitterle, a GTRI employee since 1986, was selected for the post via an extensive national search. "His knowledge of GTRI and our technical expertise, and his familiarity with sponsors and the personnel associated with his lab, will serve him well as he accepts

the strategic leadership of the laboratory," GTRI Director Richard Truly wrote in announcing Sitterle's selection.

In accepting leadership of the lab, Sitterle follows Joe Parks, who retired in July; and Gerald Smith, who has served as interim director since then.

Sitterle has served as SDL's chief scientist since 1995, and as chief of the lab's Advanced Concepts Division since 1993. He is an adjunct assistant professor in the School of Electrical and Computer Engineering. Sitterle holds a bachelor's degree in physics and mathematics from Heidelberg College, a master's in electrical engineering from Clemson University, and a doctorate in electrical engineering and

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Observed & Noted

Software piracy is serious business. To learn how to avoid piracy and the problems it causes, turn to page 3.

PST and RSD are relocating. Find out where their new homes are by reading the article

on page 3.

This month we begin an overview of each lab's research capabilities. First up? ITTL, on page 4.

GTRI hosted the Ninth Annual Electronic Protection Workshop recently.

To read more on the meeting, turn to page 4.

A special wind sensor developed in EOEML makes accurate, inexpensive measurements of average wind direction over long distances. Learn about this

research from the article on page 5.

Marilyn Smith (AERO) and her husband developed a computerized testing system for a school in Marietta. To find out about this volunteer project, turn to page 6.

The GTRI display booth won an award at a recent Old Crows meeting in Washington, D.C. Turn to page 6 for more information.

Lee Edwards (ELSYS) is retiring, but his nit-pickers are not!

On page 7, you can find out how Lee surprised his colleagues at his October retirement reception.

Professional, personnel and personal news fills page 8. Flip The Connector over to catch up on the latest news from your colleagues!

**News
&
Notes**

**Meet the
Facilities
Services Team**

Need a light bulb changed? A door knob replaced? Then you've got a job for the Facilities Services Team (FST), managed by Brenda Hill. But FST does more than just routine maintenance. This talented bunch is responsible for painting, construction and moving; tracking and maintaining GTRI vehicles; and a myriad of other things that keep everything running smoothly throughout GTRI.

Senior secretary **Delora Felix** supports the manager of FST. She is responsible for logging all requests Facilities Services receives into the facilities database and assigning personnel to each task. She also coordinates and handles paperwork for all items sent to state surplus. Delora came to GTRI from the State Department of Radiological Health. Before that, she worked as a hairdresser for 17 years.

A newlywed, Delora lives in Snellville with her husband and her two cats, Precious and Grayson. She also has a daughter, Melissa, a stepdaughter, Nicole, a son, David, and a granddaughter, Mary Elizabeth, 3. Delora's hobbies include

cross-stitching, sewing, crafts and baking. When she's not busy with work, she enjoys spending time with her husband, children and granddaughter.

Charles Johnson, a Maintenance/Construction Worker II, has been with GTRI for almost eight years. He started work in the GTRI mailroom and moved to FST after a year. In his current position, Charles is responsible for all maintenance in CRB, as well as booking and



Charles Johnson

setup of Rm. 119, the largest conference room on campus. Before coming to GTRI, Charles spent five years as a dispatcher for Lockheed. Before that, he worked for Warner Brothers Records for almost 10 years. While there, he met many famous musicians including George Jones and Greg Allman.

Charles grew up in Gainesville, Ga. His brother, David, also works in Facilities Services. Charles now lives in Austell with his dog, a miniature Dachshund named Fritz. When he's not at work, Charles enjoys listening to and playing music. He plays the guitar and likes a variety of music. He also is a big NASCAR fan, as well as a history and Civil War buff.

DW Senn is an Administrative Supervi-

sor II for FST. DW oversees the maintenance, scheduling and upkeep of all GTRI vehicles. He also coordinates the



DW Senn

schedules for maintenance and construction personnel and Tech Temps. Some of his other administrative duties include fielding helpdesk calls and tracking follow-up action, departmental correspondence and spreadsheets, and working on the quarterly facilities publication "FYI." Before coming to GTRI in 1983, DW spent 24 years in personnel in the Navy and the Air Force. He began his career at Tech in the Micro-Computing Facilities Services Department, which later became the Computer Related Services Department. He moved to the Research Communications Office in 1987 and worked there until coming to work for Facilities Services in 1995.

DW grew up in Brundidge, Ala. and now makes his home in Southwest Atlanta, where he lives with his Blue Tick Coonhound, Dawg. He holds an associate of science degree in education from Dekalb College. When he's not working, DW spends his time working on his house, listening to music and learning to play the guitar and keyboard. He is also very active in his church, the Grace Bible Fellowship in Stockbridge.

SELECTED SEPTEMBER 1996 AWARDS

Title	PI/Laboratory	Sponsor	Funded Amount
Israeli Air Force H-53-2000 AFT Fuselage/Tail Pylon...	Friend, D. (AERO)	Air Force	\$ 149,927
Rotor/Fuselage Loads	Wasikowski, M. (AERO)	Air Force	125,000
Task A3: Atlanta SHTS	Stancil, C. (AERO)	SAIC	53,552
EC Test & Eval. Infrastructure Improve. & Modernization	Eagar, W. (ARL)	Air Force	200,000
B-1B Defensive Sys. Upgrade Program (DSVP) Pre-End...	Masse, A. (ELSYS)	Rockwell Intl.	32,000
Gen-X Upgrade Support	Maynew, B. (ELSYS)	Texas Instruments	20,000
Human Factor CAD Tool for Traffic Mgmt. Ctrs.	Folds, D. (ELSYS)	U. S. Dept. of Transportation	175,000
F-16 Integ. EC Suite Mod. Recon. POD Flight Test Support	McDougal, G. (ELSYS)	Air Force	306,667
Pulse Density Support	Mayhew, B. (ELSYS)	SAIC	170,000
Performance Enhancement to the AN/ALQ-172 ARTF	Drury, T. (ELSYS)	Air Force	249,946
Missile Warning Receiver Software Engineering Services	Brooks, J. (ELSYS)	Air Force	700,000
AN/ALR-69(V) Radar Warning Receiver System...	Cole, C. (ELSYS)	Air Force	400,000
TLE for Sensor Systems	Blankenship, S. (ELSYS)	VRC Corp.	90,000
AN/ALR-69 Advanced Crystal Video Receiver...	Mack, D. (ELSYS)	Air Force	250,000
Pave Low III EW System Integration	Brooks, J. (ELSYS)	Air Force	1,035,000
ALR-69 CD Band Receiver Study	Willis, M. (ELSYS)	Air Force	800,000
Integrated Elect. Combat Sys. Threat Response Matrix Dev.	Wright, G. (ELSYS)	Air Force	500,000
AN/ALE-47 Integrated Support Station (ISS) Modifica. Kit	Strike, T. (ELSYS)	Air Force	1,165,000
HH/MH-60C Pave Hawk Integr. Elect. Warfare Sys. Dev.	Hallman, J. (ELSYS)	Air Force	420,000
EW Techniques Analysis	Rogers, W. (ELSYS)	Air Force	105,000
Applica. of Poll. Prevent. for Tech. to Reduce Indoor Air...	Bayer, C. (EOEML)	Environmental Protection Agency	100,000
Fighter Verification & Validation	Hyde, R. (EOEML)	BDM Corp.	65,325
Advanced EO Model for Aerial Targeting II (AEM-ATII)	Owens, W. (EOEML)	Air Force	75,000
Integrated CSS Stamis (ICS3)	Miller, M. (HRO)	Army	124,997
Generic Demonstration Modeling Capability	Pritchett, P. (HRO)	Army	25,378
Corps SAM Coop. Engagement Cap. Interface Support	Dalton, J. (HRO)	Army	50,000
ADSAM Engagement Near Term Experiment	Strickland, M. (HRO)	Army	24,985
Design and Imple. of State of Ga. Superior Court Autom...	Sills, L. (ITTL)	Georgia Courts Authority	265,454
Opossum Nexus Analysis	Wilson, B. (ITTL)	Army	399,560
CERMET Doughnut Analysis	Wilson, B. (ITTL)	Army	70,000
GPS Moving Map	Pyles, J. (ITTL)	Air Force	472,823
Transceiver Susceptibility Analysis	Moss, R. (ITTL)	Army	60,000
Advanced Threat Emitter Requirements Analysis	Williams, A. (SDL)	Army	197,216
XM-15S Simulator	Camp, S. (SDL)	Army	981,427
Counter-PGM Red Team Supp. of GPS/INS Testing	Wheeler, M. (SEAL)	Lincoln Laboratory	26,788
Add-on to Invest. of ECM Vulnerability for Foreign Missile	Adams, J. (SEAL)	Dynetics Inc.	27,075
Eval. of Radio & Microwave Tech. for Motor Veh. Safety...	Greneker, E. (SEAL)	Ga. Dept. of Transportation	200,000
MMW Seeker Support	Dugas, S. (SEAL)	Army	350,000
Electromagnetic Environmental Generating System	Clark, D. (SEAL)	Navy	140,000
Non-Cooperative Target Identification (NCTI) Technology	Cohen, M. (SEAL)	Navy	122,000
Additional Efforts on Space Based Surveillance Modeling	Tuley, M. (STL)	Mission Research Corp.	42,191

Did You Know?**Ahoy Mate!
Software Piracy
Is Serious
Business**By **Joey Goddard, OCA**

Would you take software from a computer store without paying for it? Of course not.

Yet many people are stealing software every day without realizing it. They are committing a felony known as software piracy.

Software piracy is the duplication of a piece of software for any reason other than as a back-up, without the permission of the copyright holder. This includes loading a single copy of software onto several computers; renting software for temporary use; or downloading unauthorized software from electronic bulletin boards or the Internet.

"Software is considered intellectual property under Title 17 of the U.S. Code," explained Keith Watson, computer support specialist for the Administrative Information Systems Team (AIST). "If you copy it without permission, you are infringing on a copyright and can be held criminally liable."

"Many people assume that, because we're an educational institution, Georgia Tech is exempt from copyright laws, but that is rarely, if ever, the case," said Gail Gunnells, deputy chief legal advisor for Georgia Tech.

Watson agrees.

"People [sometimes] don't realize that software falls under the same rules as

records, books or movies," he noted. "It has always been illegal to copy software, but manufacturers have only recently started cracking down on piracy."

The Software Producers Association (SPA), whose 1,200 members account for 85 percent of the sales of software in the United States, have launched a campaign to educate consumers about software piracy and to punish those who violate copyright law. The SPA estimates that software piracy cost manufacturers more than \$1 billion in the United States last year and more than \$8 billion worldwide.

"Additionally, Georgia Tech is a licensor and developer of software, and we expect those who use our software to respect our copyright," Gunnells said. "It only makes sense that we do the same."

One of the most common forms of piracy is "Softlifting" -- loading software on to more than one machine at the office, or copying software to take home.

"Some companies think it's too expensive to buy a copy of software for each of their employees," said Watson. "But when you think about it, you wouldn't buy a car unless you could afford the insurance. People need to have the same attitude when it comes to having a license for their software."

Section 6.8 of the Georgia Tech Faculty/Staff Handbook states that "copyright laws will be obeyed in all instances" and that "Departments and Schools should ensure that funds are made available to legally obtain software."

"Unfortunately, licensing agreements vary from maker to maker," said Tom Brown, director of AIST, "but generally, the one license per computer rule applies."

"Most people obtain their software legally," he said, "and then lose or misplace their license. This can result in serious trouble if you're ever audited."

Brown says that it is important for soft-

ware users to understand their licensing agreements. He points out that manufacturers may exercise discretion in deciding what will constitute a license.

"For a few software producers, having the original diskettes or bill of sale may be enough, but most require a proof-of-license card, a registration card or a signed agreement that must be returned to the supplier," Brown said.

"If you are audited and you are unable to produce the proof of license for each software application on your machine, you may be found guilty of software infringement," Watson warned.

Gunnells cautions that the penalties for copyright infringement can be harsh—anywhere from \$200 to \$100,000 per infringement with both the Institute and the individual subject to prosecution.

"Each time the software is copied or loaded illegally constitutes an infringement," she said. "At \$100,000 each, you can get into some serious trouble."

According to the SPA, software manufacturers have been awarded more than \$16 million in damages and settlements from piracy cases since 1985. In one case last May, a Florida university paid software makers \$135,000 to settle a lawsuit brought against it for copyright infringement.

"We're talking about a lot of money here," Watson added, "but even worse would be the damage to Georgia Tech's reputation."

Brown maintains that good management of software and licenses can prevent piracy from occurring.

"If you have a centralized system where people are held accountable for keeping track of their software and licenses, you won't have any problems if you are audited," he said. "The bottom line is that it's always in your best interests to do the right thing."

**News
&
Notes****PST and RSD Relocate**By **Lea McLees, RCT**

Two support groups will be moving by the end of the year to accommodate the space needs of growing labs in CRB, says Evan Chastain, manager of Support Services.

The Research Security Department (RSD) and Personnel Services Team (PST) will relocate as additional ELSYS and STL researchers are added.

"The two labs are currently located primarily on the fourth, fifth and sixth floors of CRB," Chastain said. "The desirable thing is to keep any lab or unit together, in one place. The ways we can do this are either lease more space in CRB, or move support units from CRB to other buildings to provide more space for the labs. A combination of these strategies make up this current decision."

With the exception of the technical library, RSD is moving from CRB's first floor to the ground and second floors of O'Keefe. The technical library will stay on the first floor of CRB.

"Our facilities staff is preparing space for RSD in O'Keefe, which will

be ready by mid-November," Chastain said.

Once RSD moves to O'Keefe, PST will move from its current first floor CRB space next to the high bay, into RSD's old space.

Part of the space vacated by PST will go to Bob Gregor's work in the Department of Health and Performance Sciences. The remainder will go to STL researchers who are conducting work in the high bay.

GTRI is also looking into leasing additional lab space in CRB that was vacated by several academic units' moves to GCATT, and conference room 603 has been turned into temporary office space for STL. Several campus-wide space issues -- including crowding in the Manufacturing Research Center (MARC) and potential new uses of Research Area II -- are also under discussion, and may drive other moves.

On the Move!**Awards***From page 1*

schools and colleges, Truly noted. This data mirrors FY 96 collaborative performance.

This first quarter of FY 97 was preceded by a seven percent increase in annual expenditures, to \$102.9 million in FY 96 from \$95.6 million in FY 95.

"We had a very strong FY 96 and are projecting a strong FY 97," Truly noted. "We have plenty of challenges, but so far, so good."

In FY 96, GTRI's contract sponsorship broke out as follows:

U.S. Air Force: 35 percent
Navy: 4 percent
Army: 19 percent
State of Georgia: 10 percent
Other: 2 percent
Industry/commercial: 4 percent
NASA: 1 percent
Federal non-DOD: 4 percent
Industry/fed. subcontract: 14 percent
Other DOD: 7 percent

Commercial industry work doubled during the last year, Truly noted

"We have spent a lot of time trying to develop easier-to-use contracts," he said. "We're trying hard to improve that area."

Focus on Research

Technical monitor Frederick Moorefield Jr. (center) recognizes keynote speaker Emil Martinsek (right) as Guy Morris looks on. Martinsek spoke at the Ninth Annual Electronic Protection Workshop. (Photo courtesy Molly Gary)

Lab Overview Series

This is the first in a series of articles on each GTRI lab's research capabilities.

ITTL: Communications, Networking, Computer Science, Information and Manufacturing Technology

By Joey Goddard, OCA

The Information Technology and Telecommunications Lab (ITTL) provides solutions to complex problems of information processing, storage, representation and exchange.

"The areas of research within our lab are definitely touching more people than ever before," said Randy Case, ITTL director. "Our organization is a sort of one-stop-shopping place for all information technology research needs."

The diversity of ITTL's capabilities is reflected in its two divisions and one program office. The Communications and Networking Division (CND) focuses on wireless communications, broadband telecommunications, military communications, C3 countermeasures and systems analysis.

"One of our biggest areas of potential growth is in broadband technology," said Eric Barnhart, head of CND. The new Broadband Telecommunications Center (BTC), a collaboration of researchers from GTRI, the College of Computing and the School of Electrical and Computer Engineering (ECE), was started last year to focus on broadband systems. Barnhart anticipates that the center will experience even more growth over the next year.

"Many broadband topics are not really 'new,' but the topics are now receiving a lot of attention in the industry and in general, so I think we will see a significant increase in research contracts," Barnhart said.

The CND is also focusing on systems analysis. Most of the division's work in this area is done for the Army's National Ground Intelligence Center (NGIC) in Charlottesville, Va. "We have already done a great deal of research for NGIC," Barnhart said, "but there is the potential to do much more."

The Computer Science and Information Technology Division (CSITD) concentrates on information management systems, decision support systems, software engineering, database management, artificial intelligence, network design, simulation and modeling, and advanced software technology.

An expanding area of research for the CSITD is modeling and simulation. "This technology allows us to represent reality in order to better understand, predict or control what is happening," explained division chief Terry Hilderbrand. "We are working to develop protocols so that models can be compatible with other models. This kind of simulation has applications in military, manufacturing and industrial settings."

The CSITD is also branching into law enforcement technology. "We are one of



GTRI Hosts Ninth Annual Electronic Protection Workshop

By Molly Gary, SEAL

A total of 145 people attended the Ninth Annual Electronic Protection (EP) Workshop hosted by the Sensors and Electromagnetic Applications Lab (SEAL) at the Cobb County Research Facility, Oct. 29-31. Attendees represented military, civil service, industry and university organizations. The workshop is conducted under the sponsorship of the Electronic Combat Branch of Wright Laboratory (WL/AAMW), Wright-Patterson Air Force Base, Ohio, with Frederick D. Moorefield Jr. serving as technical monitor.

Attendees learned from 34 technical

presentations and three "published but not presented" papers in threat environment, infrared counter-countermeasures (IR-CCM), adaptive processing, EP techniques, synthetic aperture radar (SAR) electronic attack (EA)/EP, database, analysis, low cost radar EP, radar systems and testing/simulation/risk assessment. Georgia Tech technical presenters were Chris Barnes, Molly Gary, Lamar Gostin, Steve Kogon, Rick Maier and Aram Partizian (SEAL); David Schmieder (EOEML); Neil Lareau (ELSYS); and Anne Collier and Mary Ann Ingram of the School of Electrical and Computer Engineering.

Guy Morris, EP program manager at GTRI, hosted the event, and Molly Gary coordinated the workshop.

For more information, contact Molly Gary at 770-528-7731 or at molly.gary@gtri.gatech.edu.

only a few universities applying information technology to law enforcement," Hilderbrand said.

One of CSITD's law enforcement projects is the Court Automation Project, headed by Lisa Sills. Funded by the Georgia Courts Automation Commission, the project uses database, information management and decision support technologies to link together court systems from around the state.

Hilderbrand is optimistic about the growth potential for this research. "The technology being developed for this project could be useful on a national level," he said.

"The ability to share data between systems is becoming increasingly important, not only in law enforcement, but also in banking, healthcare, education, and industry," Case added. One of the ways the CSITD is solving this problem is with the HyperTech project."

A collaborative effort with the School of Literature, Communication and Culture (LCC), HyperTech is a graphical system that allows users to search different types of data.

"It is easy for critical patterns to get lost because we don't have efficient systems," he said. "We are looking for better ways to manage and integrate data."

Another area essential for streamlining

Sitterle

From page 1

applied physics from Case Western Reserve University.

Sitterle's interests include radar and other sensor systems, signal processing techniques, sub-millimeter wave propagation, adaptive filtering theory, pulse Doppler meteorological radars, adaptive filters and detection of wind shear. His recent engineering assignments have included analyzing Kalman filtering algorithms, and performing systems engineering for development of the XM-TAS medium range, phased array acquisition radar recently fabricated in SDL. Previous work included development of an ultra-low phase noise coherent microwave source using superconductor techniques, the development of multiple target tracking algorithms, modeling and simulation of target and clutter echoes, development of adaptive detection techniques, and analysis of the effects of radar instabilities on pulse compression and moving target indicator performance.



Continued on page 5

Accurate, Inexpensive Sensor Measures Average Wind Direction Over Long Distances

By Lea McLees, RCT

A prototype, non-Doppler optical sensor that makes inexpensive, accurate measurements of cross wind speeds over long distances holds promise for chemical manufacturing, aviation safety and meteorology.

The single-ended, long-path laser wind sensor registers faint wind movements that an anemometer cannot measure. Test results show its measurements of higher wind speeds correlate with those of anemometers, said Mikhail Belen'kii (EOEML).

The sensor, originally developed for chemical plants, is designed to work alongside other sensors that measure airborne chemical concentrations, said Gary Gimmestad (EOEML).

"If you measure the concentration and the cross wind at the same time, you can get a good idea of the rate at which a pollutant is leaving a plant," he explained.

But because the sensor measures average wind directions over long distances, it might have additional applications in aviation, meteorology or aerosol dispersion studies. It would be particularly useful in locations where erratic winds are the norm — tank farms, cities or widely varying landscapes. A provisional patent application has been filed on this work.

The sensor's design is very simple. All optics and electronics are mounted on a large telescope. An inexpensive helium neon laser about two inches in diameter projects a beam of light from this unit onto a target approximately 100 feet away. The target is made of retroreflective materials used on highway signs.

The telescope collects laser light reflected by the target, and sends it through the series of optics. Among those optics are two tiny, horizontally separated detectors, each of which

monitors a spot on the target inside the laser beam. The detectors pick up shadowy waves, or fringes, moving across the laser beam. The waves are visible on the target material.

Each of the two detectors in the sensor registers the moment at which a dark fringe passes its view. By digitizing the points at which each detector picks up a single wave, a computer can measure time and separation. It then can compute the average velocity of a massive column of air crossing the laser beam. In this case, wind speed calculations were made every 10 seconds.

The sensor correlated extremely well with anemometer readings in test results with 100 feet between the sensor and the target. A 5 percent discrepancy, within the limits of experimental error, was observed between wind speed measurements by the sensor and by the anemometer in laboratory tests.

Companies often rely on anemometers to check wind direction and velocity. But the anemometer measures wind in just one location. To duplicate the work the prototype sensor performs, a row of anemometers would have to be placed side by side in a line as long as the laser, Belen'kii said — a very expensive proposition.

"The cost of this sensor would be less than that of one meteorological tower," Belen'kii said.

The sensor is easier to use than Doppler systems, the researcher says. In addition, it measures wind across the beam of light — rather than along the beam, as Doppler systems do. And unlike conventional LIDAR systems, this sensor can pick up turbulence.

The sensor operates well in sunlight and in darkness. Like many optical systems, the sensor doesn't work as well in rain or fog, because these conditions obscure its target. And the sensor can only measure the component of wind that crosses the laser beam at right angles. However, one sensor could be made to rotate among several targets, checking air movements at a variety of angles.

Researchers next plan to test the sensor with technologies that measure airborne pollutant concentrations at a real refinery plant. Additional testing might include tracking cross wind speeds from the tops of city buildings, and modifying the sensor slightly to measure cross

winds and wake vortices along runways at airports. The sensor also could be configured to measure vertical winds, which would provide an unusual, three-dimensional capability.

Varying the laser wavelength, power and beam geometry, target type and range, receiver diameter and data processing algorithms could make the sensor useful in additional areas, as well.

A poster paper on this work was presented at the International Symposium on Optical Science, Engineering and Instrumentation in Denver during August. The work was funded under project E-9004-104 in the GTRI Internal Research Program.

ITTL

From page 4

business processes is development of collaborative design and management tools. The Manufacturing Technology Program Office (MTPO), under Ron Bohlander's direction, is performing collaborative research in this area.

"These tools are becoming more necessary as distributed working and learning environments become more prevalent," Bohlander said.

The MPTO, established in 1987, manages large manufacturing programs that cut across multiple labs in GTRI and academic units. One example is a \$10 million contract from the U.S. Army Missile Command's Manufacturing Technology Office.

"Our purpose is to coordinate efforts on campus in manufacturing research," Bohlander explained. "Most of our research calls for collaboration among labs and academic units. We work as a liaison between the sponsor and the researcher, maintaining a standard for deliverables and solving any problems that arise."

The MTPO also functions as a development office, identifying new opportunities in manufacturing topics for GTRI. "Manufacturing research involves everything that goes on in a manufacturing enterprise," Bohlander said. "Because it's so broad, there are a lot of possibilities for research."

Bohlander sees optoelectronics and microelectronics processing as two of the hottest areas in manufacturing research. "We are trying to take basic research in these areas and apply it to the industry systems and processes that need it," he said.

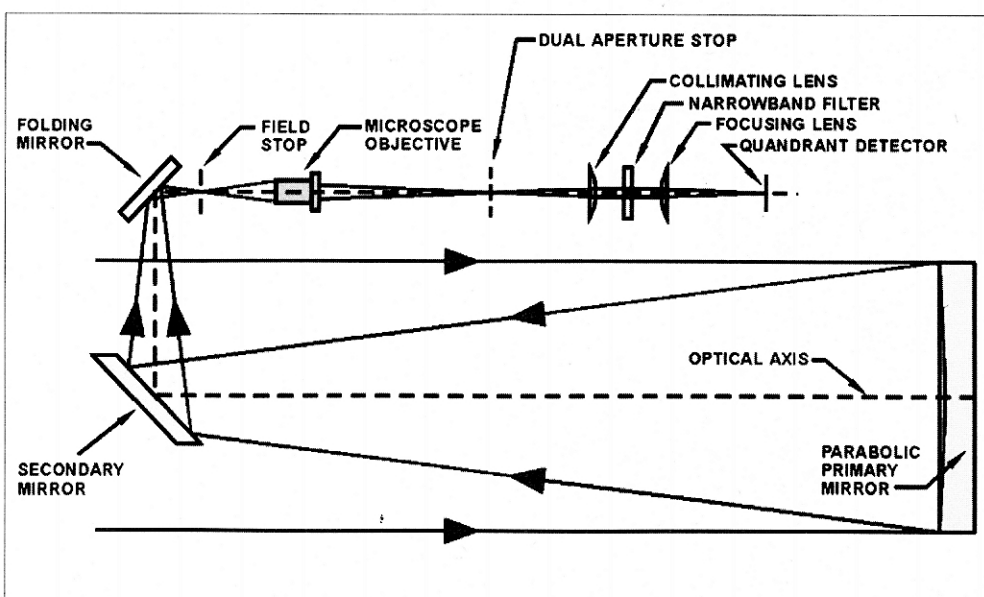
In the coming year ITTL plans to continue diversifying its sponsor base.

"Our lab fills a critical technical niche," Case said. "We provide specialty skills that also make us an excellent partner for industry."

The lab also will retain a strong relationship with its military sponsors. "Although spending by the military has decreased in the past few years, spending by some of our sponsors has actually increased," Barnhart said. "We believe that our previous partnerships with defense sponsors will give us an edge."

Case agrees.

"It's our skills and the quality of the research that we do that brings people to us," he said.



Focus on Research

Diagram of prototype non-Doppler optical sensor developed in EOEML. (Graphic courtesy Sheree Collins)

News & Notes

Marilyn Smith and her daughter, Allison, demonstrate the computerized testing system Marilyn and her husband, Robert, set up at Allison's school. (Photo by Joey Goddard)

Helping Our Communities

Smiths Computerize Testing for Elementary School

By Joey Goddard, OCA

When Marilyn Smith realized that the literacy program at her daughter's elementary school was getting bogged down in paperwork, she didn't complain — she did something about it. Marilyn and her husband, Robert, both Georgia Tech graduates, developed and installed a computerized testing system to help increase the efficiency and effectiveness of the Literary Guild Program at A.L. Burruss Elementary in Marietta. The program, which was started by the school's Parent Teacher Association (PTA), was designed to foster students' interest in reading. Students in grades two through five are given a list of more than 100 books appropriate for their individual reading levels.

"The books on each list consist of different categories ranging from poetry to biography," Smith explained. "The student must read three books from each category and pass a test on each book. Once they finish the minimum requirements and have read 36 books, they are awarded a trophy."

The problem, the Smiths realized, was that the tests were administered by parent volunteers who were only available at certain times.

"My daughter sometimes had to wait weeks to take a test because she could only go when it was convenient for the teacher and the volunteer," Marilyn Smith said. "My husband and I thought that surely this was something that could be automated, so we began searching the web for testing software."

The two found "Take a Quiz" shareware by Philip Kapusta, and then augmented the software to fit the Literary Guild Program by writing wrappers and typing in questions. So far, the Smiths have spent more than 150 hours of their free time working on the project — and according to the school's principal, it has been well worth it.

"Up until now, it's been very labor-intensive, because every child who reads a book has to take a quiz," Principal Jerry Locke said. "There were several steps, and it took a lot of time. Plus, it was kind of a bottleneck for the kids, because [the volunteers] would get backed up with 40 kids waiting to take a test."

"Now the students take the tests when they're ready," Marilyn Smith said. "They are scored automatically, so you only need a volunteer for an hour or two a week to monitor the progress."

Burruss Elementary was the winner of an Exemplary Reading Program Award for 1996. The award, which is given by the



International Reading Association, is presented annually to one school in each state with an exceptional literacy program. Marilyn Smith says that there has been a great deal of interest in the Literary Guild program from other schools in the area.

The Smiths say they are willing to help out in the area of computerized testing.

"All they really need is a PC and the shareware," said Marilyn Smith. "We can pass along our information."

"When you think of maybe thousands of those [quizzes] given in a year, and there have been thousands ... getting this computer has been a real step forward," Locke said. "It just saves so much time."

Marilyn Smith noted that in the first three weeks of using the computerized testing system more than 500 tests had been given.

"I think it's more of an incentive because the kids like doing things on computers," said Locke, who described the system as very user-friendly. "Most of the time, they're waiting in line to get to those two."

Display Booth Recognized by Association of Old Crows

By Ron Smith, ARL

GTRI's display booth at the 33rd Annual Association of Old Crows

(AOC) International Electronic Warfare Technical Symposium and Convention was ranked tops among all exhibitors in the Small Booth Exhibitors category.

The AOC awards committee gave the booth that distinction during the meeting, held Sept. 29-Oct. 1 in Washington, D.C.

GTRI researchers who staffed the booth showcased the work of several labs and spoke with key Department of Defense military and civilian employees,

as well as a number of international representatives. They told attendees about GTRI's offerings to the defense industry in electronic warfare continuing education, simulations, flight test data recording and mission planning. Those who stopped by the booth learned how and why GTRI is a leader in technology that supports electronic warfare and simulation requirements in the U.S. and around the world.

Those who staffed the booth included Terry Tibbitts, Bob Zimmer, Myron Cramer, and Harry Andrews (ELSYS); and Kim Wood, Ron Smith and Ken Haynes (ARL).

If you would like to use the GTRI display booth at a meeting or conference, call Richard Odom (APO) at 894-7246 or send e-mail to richard.odom@gtri.gatech.edu.

Bob Zimmer (right) and Terry Tibbitts staff GTRI's award-winning booth at the Old Crows meeting. (Photo courtesy Nancy Christmus)



Home of the 1996 Olympic Village
Georgia Tech Research Institute

GTRI Greetings

Welcome to some of our newest employees!

Ten Good Things We Know About Melinda Higgins

1. She has worked as a Research Scientist II in the Environmental Research Branch of the Electro-Optics, Environment and Materials Lab (EOEML) since February. While an undergraduate, she worked in EOEML with Charlene Bayer during summer and winter breaks between 1986 and 1990.
2. Melinda's research interests include pattern recognition, chemometrics, experimental design and modelling, statistics and analytical chemistry.
3. A graduate of Saint Andrews Presbyterian College in Laurinburg, N.C., Melinda earned a bachelor's degree with a double major in chemistry and math.
4. Melinda has two graduate degrees from the University of South Carolina: a master's degree in statistics and a Ph.D in analytical chemistry.
5. One of Melinda's proudest accomplishments was winning the Professional Women on Campus Award at USC for writing the Outstanding Paper by a Woman Graduate Student in 1994.
6. Melinda is a native Atlantan. Her father, Hugh Denny, worked as a principal re-

search scientist in the Sensors and Electromagnetic Application Laboratory (SEAL) of GTRI for 35 years.

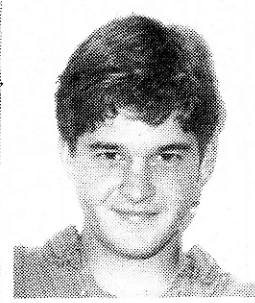
7. She has been married for four years to her college sweetheart, Roger, a computer network administrator.
8. The two live in the Emory area with their cats, Dawn and Dusty.
9. One of Melinda's favorite hobbies is horseback riding. In college, she competed in National Intercollegiate Horse Shows in English Huntseat and Western Stock Seat riding.
10. When she's not working, Melinda also enjoys cooking, knitting, the Atlanta Braves and ACC basketball.

Ten Good Things We Know About Tony Wasilewski

1. He is a Research Engineer I for the Image Processing Branch of the Electro-Optics, Environment and Materials Lab (EOEML).
2. Before he started working full-time for GTRI last June, he worked as a Tech Temp for a year in the Electronics Systems Lab (ELSYS).
3. Tony is currently working on the Georgia Tech Vision Model (GTV), a computer model of the human visual system that can predict human performance in visual search and detection tasks.
4. He has a bachelor's degree in electrical engineering from the University of Illinois in Champaign-Urbana, and a master's degree



Melinda Higgins



Tony Wasilewski

in electrical engineering from Tech.

5. As an undergrad, Tony worked as a typesetter at night while attending school full-time. He worked as an engineer at a local radio station during the day.
6. He says his decision to come to Tech was influenced by the nice, warm weather here — that and the excellent Digital Signal Processing Department in the School of Electrical and Computer Engineering.
7. Tony grew up in Decatur, Ill. His family now lives in Cincinnati, Ohio, with the exception of one brother in Atlanta.
8. He now lives in Decatur, Ga., with his four roommates: three humans and one canine.
9. In his free time, Tony likes mountain biking, running and playing soccer. He also enjoys going out with friends in Decatur and Virginia Highlands.
10. When he's not on the go, Tony also enjoys cooking. His specialty is Thai food.

Focus on Folks

Lee Edwards May Be Retiring, But His "Nitpickers" Are Not!

By Lea McLees, RCT

Lee Edwards is a tough act to follow — just ask his System Engineering Division colleagues.

He surprised and entertained everyone at his Oct. 24 retirement reception by bequeathing valued work items to his successors. Among the gifts associate division chief Kathy Schlag (ELSYS) received were one gorilla-sized and one amoeba-sized pencil — Lee's "mega- and micro-nitpickers," used for rooting grammatical errors out of reports. Division chief Terry Tibbitts (ELSYS) received a lot of paper.

"If you want to excuse yourself to take care of these things, Terry, you can," Lee said as he presented successor Tibbitts with a thick red folder marked URGENT.

At least 100 people stopped in to thank Lee for 35 years of service to GTRI. Among those attending were Lee's wife, Sue; his mother-in-law, Elizabeth Barger; and his son, Matthew. Recent GTRI retirees Larry Holland, Bob Willoughby, Dusty Rhodes and Jerry Eaves attended, as well. His division mates presented him with a multitude of funny gifts and a CD player, speakers and receiver/amplifier. Several co-op students gave Lee big hugs and symbolic checks.

"If a student's paycheck was late for some reason, Lee would often pay them out of his pocket until their check arrived," Terry Tibbitts noted.

"When I started at Tech as a freshman, I

never envisioned a day like this," Lee said. "Working at GTRI has been a great experience. The thing that makes it so good is the people who work here...your honesty, integrity, initiative and dedication to accomplish what the sponsor wants...you get the job done."

"Not only that, you care for each other in a way that builds great teamwork," he said. "You care for me, I care for you, and I always will."

Lee began his freshman studies in physics in 1953. He returned to Tech in 1964 to work for GTRI as an assistant research physicist. In addition to his bachelor's, he holds a Tech doctorate in physics and a master's in physics from Carnegie-Mellon University.

His research and development efforts produced improved methods for detecting, identifying and classifying electromagnetic signals, and the means for coordinating countermeasure responses. He has worked on electronic warfare and radar countermeasures techniques, microwave antennas, electromagnetic field measurement techniques and more.

Lee holds U.S., Canadian and German patents as co-inventor of a music delivery system. The patent describes a method for recording on a single medium several wideband signal channels, each of which consists of several audio channels. The patent also describes the way in which all

of the audio signals could be retrieved at the same time for broadcast.

Lee served as chief of the System Engineering Division, formerly the Electronic Support Measures Division, in ELSYS from 1993 until this summer. Previously he was associate director of the former Electronic Support Measures Laboratory and of the Systems Engineering Laboratory; chief of the Systems and Antenna Applications Division; and manager of the Advanced Technology Technical Area. Before coming to GTRI he was a manager at Kelvin and Hughes America Corp. and worked as



Lee Edwards displays a "seven-day supply" of Post-it® notes for reviewing reports. He bequeathed the package to colleague Kathy Schlag (ELSYS). (Photo by Lea McLees)

a physicist while on active duty in the Navy. He is a member of the Institute of Electrical and Electronics Engineers, Sigma Xi and the Association of Old Crows.

Among the funny gifts he took home were a 23-channel CB radio and an 8-track tape player with tapes — for his 1965 Oldsmobile F85 and 1978 Olds Cutlass

Continued on page 8

Focus on Folks

Professional Activities

Electro-Optics, Environment and Materials Laboratory

Vicki Ainslie presented information on the EPA Lead Requirements for Disclosure of Known Lead-Based Paint and/or Lead-Based Paint Hazards in Housing Final Rule for ReMax Realty on Oct. 29.

Myrtle Turner presented information on the EPA Lead Requirements for Disclosure of Known Lead-Based Paint and/or Lead-Based Paint Hazards in Housing Final Rule for the Metro Brokers Cobb County Office on Oct. 29.

Gary Gimmestad, Wayne Daley and **Richard Carey** attended the Highway Visibility Conference in Huntsville, Ala., Nov. 6-7. Gimmestad presented "Fog Detection and Warning System" and also chaired a discussion session on highway visibility research problems.

Mikhail Belen'kii's "Effect of the Inner Scale of Turbulence on the Atmospheric Modulation Transfer Function" was published in the *Journal of the Optical Society of America A*. He presented an invited paper, "Tilt Angular Correlation and Tilt Sensing Techniques with a Laser Guide Star," at the European Symposium on "Satellite Remote Sensing III" in Taormina, Italy.

Art Wickman presented an overview of industrial hygiene and personal protective equipment to company representatives attending the Georgia Manufacturing Extension Alliance on Oct. 24 in Columbus, Ga.

Bob Schwerzel attended the annual Advisory Board Meeting of the Center for Photochemical Sciences (where he is an adjunct professor) at Bowling Green State University, Bowling Green, Ohio, on Oct. 18. He also was an invited participant in an NSF-sponsored U.S. - Japan Workshop on Photo-Responsive Materials, held in Catalina Island, Calif., Nov. 3-8. This workshop was co-organized by Georgia Tech's Gary Schuster (Dean, College of Sciences) and Laren Tolbert (Director, School of Chemistry and Biochemistry). Schwerzel gave an invited seminar in the physics department at Virginia Polytechnic Institute and State University, his alma mater, on Nov. 14.

Roc Tschirhart was the Georgia Tech site host for the ISO 14000 Satellite Conference on Oct. 24. The three-hour conference covered the latest developments in this emerging global environmental standard.

John Nemeth and **Bob Newsom** attended a workshop titled "Plasma Arc Technology: Current Practices for Waste Treatment, An Information Exchange," in Alexandria, Va., Oct. 29-30. Nemeth presented "Environmental Applications Research and Future Plans in Plasma Arc Technology at the Georgia Institute of Technology." This information exchange

was sponsored by the National Defense Center for Environmental Excellence (operated by Concurrent Technologies Corp.) and the Electric Power Research Institute. Participating agencies included the Department of Defense, Department of Energy and Environmental Protection Agency. Ongoing projects were discussed by attendees and representatives from industry, government and regulatory agencies. A tour of the Naval Research Institute Plasma Arc Laboratory was conducted.

Steve Hays presented a session on "Managing Construction Safety" at the Oct. 16 Georgia Safety and Health Conference, sponsored by the Georgia Department of Labor.

On Oct. 30 **Henry Paris** chaired a symposium and presented the keynote lecture at the 1996 Materials Week in Cincinnati, Ohio, entitled "Metallurgy, Processing and Applications of Metal Wire: State-of-the-Art Technology and Challenges for the Future." This symposium was attended by an international audience of leading wire manufacturers. Proceedings of the symposium are published by the Minerals, Materials and Metals Society, Metals Park, Ohio.

Information, Technology and Telecommunications Lab

Janet Leininger and U. S. Army Research Lab personnel provided group decision support technology and expertise at the Joint Warfighting Center at Fort Monroe in Hampton, Va. Oct. 29-Nov. 5. The included multiple flag officers and staff from the Army, Navy, Air Force and Marines. They used the system for long-term strategic planning.

Personnel News

New Hires

ITL welcomes **Mark Allen**, Graduate Research Assistant; **Christopher Burton**, Graduate Research Assistant; **Gail Giles**, Systems Analyst IV; **Walter Huang**, Co-op; **Angus McLean**, Research Scientist II; **Anna Pirkle**, Student Assistant; **Michael Purcell**, Graduate Research Assistant; and **Kelly Reese**, Student Assistant. EOEML welcomes **Steven Alsum**, Graduate Research Assistant; **Michael Bagwell**, Student Assistant; **Celena Evans**, Graduate Temporary; **Thomas Jones**, Graduate Research Assistant; **Cornell Lawrence**, Graduate Research Assistant; **Brice MacLaren**, Temp. Professional Adv.; **Calvin Mapp**, Student Temporary; **Tom McKlin**, Temp. Professional Adv.; **Yancy Riddle**, Graduate Research Assistant; and **Sean Thomas**, Student Assistant. SSD welcomes **Jerome Carter**, Custodian I; and **Larren Murphy**, Student Assistant. AERO welcomes **Paolo Cataldi**, Graduate Research Assistant; **Daniel Helmick**, Graduate Research Assistant; **Shayne Kondor**, Research Engineer I; **Scott Munro**, Graduate Research Assistant; **Steven Reece**, Graduate Research Assistant; **Anthony Richards**, Student Temporary; and **Melissa Yale**, Student Temporary. AIST welcomes **Nicola Giberti**, Graduate Research Assistant; and **Padma Rao**, Gradu-

ate Research Assistant. ELSYS welcomes **Philip Hurwitz**, Technical Writer I; **Matthew LeBlanc**, Research Engineer I; **Pamela Shipp**, Graduate Research Assistant; **Octavian Stan**, Graduate Research Assistant; and **Barbara Totten**, Administrative Secretary. RO welcomes **Shanna Johnson**, Student Assistant. STL welcomes **Lynn Fantain**, Research Scientist II. RSD welcomes **Kendra Parker**, Building Attendant. SEAL welcomes **Yaron Seliktar**, Graduate Research Assistant.

Moving On

Brian Camp, **David Descoteaux**, **Michael Ellis**, and **Todd Jackson** (EOEML); **Larry Bass** (SSD); **Kevin Bone**, **George Etheridge**, **Thomas Green**, **Barbara McCord**, **Dominic Nguyen**, and **David Scruggs** (AERO); **Arthur Fleming-Dahl**, **Cynthia Davis**, **Ivan Tacic**, **Brian Williams** (ITL); **Matthew Garland**, **Arthur Redfern**, **Shane Trapp**, and **Kenya White** (ELSYS); **Wendy Loihle** (SEAL); **Thomas McElwain** (STL) are moving on.

Transfers

John Mills transferred from SDL to EOEML.

Mark Pellegrini transferred from ITL to ELSYS.

Margaret Horst transferred from STL to ITTL.

Personal Notes

Wedding Bells

Linda McGinnis (SDL) married Roger Martin on Sept. 16.

Cradle Roll

Laurie and **David Aalfs** (SEAL) recently welcomed twin sons. Ian and Phillip were born on Oct. 11.

James A. Scheer (SEAL) recently welcomed a grandson, James Hampton Scheer.

Edwards

From page 7

Station Wagon; and a "classic car repair kit" including baling wire, duct tape and chewing gum. Because of alleged campus police complaints about Lee's noisy jogging, the division gave him a "muffler" (really a scarf) for his shoes. A supply of "selected grammatical errors for home use" also made it home with Lee.

"There's never been a shortage of them before," he quipped.

Tom Autrey (ELSYS) sketched a portrait of Lee at work and provided a photo of a locomotive from the Atlanta, Birmingham and Coast Railroad — Lee's dad was a vice president of that railroad.

Now that he's retired, Lee will be spending more time with his wife, Sue, and his son, Matthew, and enjoying their vacation cottage in the North Carolina mountains.

"I also want to pursue some hobbies — music, sailing and reading — after I catch up on about two years' worth of delayed repair and home improvement jobs," Lee said.

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