Georgia Tech

Research News

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NEW OPTICS CENTER TO COORDINATE $6 MILLION IN RESEARCH; WORK OF FACULTY IN OPTICAL SCIENCE/ENGINEERING

For Immediate Release
November 13, 1990
Photographs Available

The Georgia Institute of Technology has launched a new Center for Optical Science and Engineering (COSE) to coordinate interdisciplinary research and education programs in optics. Optics programs at Georgia Tech include nearly 70 faculty members and more than $6 million a year in research.

Organizers expect the Center to broaden educational opportunities in the expanding field of optics, increase interaction among faculty, provide for shared facilities, expand research activities -- and give potential research sponsors easier access to a broad-based research program which includes optical materials, classical optics, photonic sensing, telecommunications, holographic storage of computer data, optical computing, electro-optic sensors, and a host of other disciplines.

The effort formally began with an inaugural symposium November 2-3.

"The Center will allow us to facilitate the transfer of students between various academic programs, and it will provide an umbrella for a number of activities involving all units on campus that are involved in optics," said Dr. Carl Verber, a professor of Electrical Engineering and one of the Center's co-founders. "The whole idea is to be a facilitator throughout Georgia Tech."

Tech's educational programs in optics are found primarily in the School of Electrical Engineering and the School of Physics, but also include units such as the College of Computing and School of Mechanical Engineering. Sponsored research programs take place in the academic units, as well as in the Georgia Tech Research Institute (GTRI).

Verber believes Georgia Tech's diverse research program allows it to offer an integrated approach to many optical science problems.

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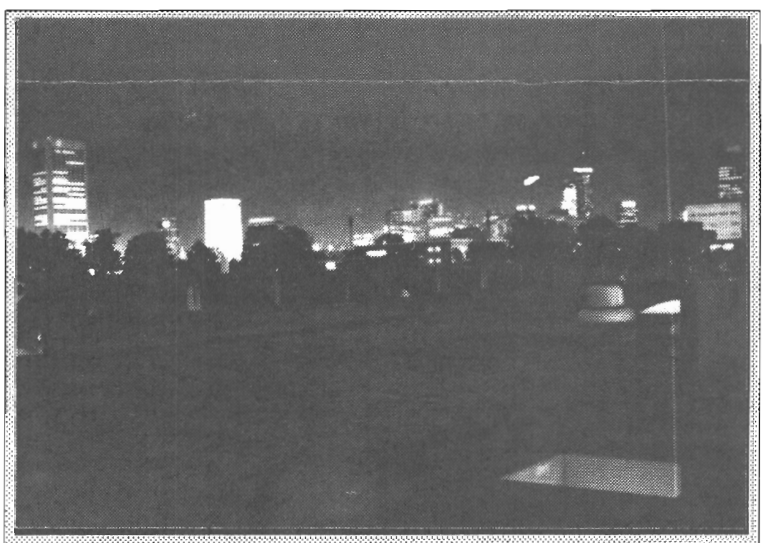

LIDARs (LIght Dectection And Ranging system) like this one are part of the optics program at Georgia Tech.

"In the integrated optics area, we offer not only the people who can design the devices, but we also have people who understand the systems in which the devices will operate, and we have the facility in which to make them," he explained. "It's a very good combination."

In addition to the optics-oriented work, Tech researchers use optical technology for sensing and measuring in other disciplines, noted Devon Crowe, associate director for Strategic Planning and Internal Research. The interdisciplinary nature of the center will help researchers from different fields gain collaborative help to "fill in the gaps" for their work.

"Optics is part of a very large fraction of the research activities going on at Georgia Tech," he said. "Optics work is becoming more and more part of research activities."

Unlike many research centers launched to start up new research efforts, the new Georgia Tech center was founded to improve on existing efforts, noted Dr. Donald O'Shea, professor in the School of Physics and another co-founder.

"It grew together slowly over time," he said. "There were people who recognized that optics was something interesting, and they found like-minded people on campus who could work together."

Because optical science and engineering involves so many disciplines, students hoping to receive a broad optics education must take courses in several departments, O'Shea noted. To gain research experience, he added, those same students often work in other departments or the Georgia Tech Research Institute.

The Center will facilitate such interdisciplinary work, while boosting cooperation and the sharing of resources, he said.

O'Shea sees a growing demand for graduates as optical science and engineering becomes more important with the widespread use of bar-code readers, videodisc players, fiber optic communications, and a host of other applications.

Current research areas include acoustic charge transport devices, chemical lasers, electro-optic waveguide modulators, fiber optic switching networks, holographic data storage, integrated optical sensors, laser acoustics, machine vision, optical materials, optical image processing, optical sensing, photodetectors, semiconductor lasers, sensor fusion, synthetic images and 3-D imaging.

Recent projects have included:

* The world's largest lidar system, dubbed "Megalidar," with the U.S. Air Force.
* Optical sensors for the detection of chemicals.
* Analysis of the chaotic output of widely-used laser devices.
* Laser acoustics for the non-contact monitoring of vibration and sound.
* Chemically-powered visible light oscillators and amplifiers.
* Low-cost, high-efficiency solar cells.
* Laser-induced fluorescence during the silicon deposition process for semiconductor and optical fiber manufacture.

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