



STC Supports NASA-Ames Microgravity Experiments Under Subcontract to Lockheed Martin

Since 2000, STC has successfully continued to support NASA Ames Research Center (ARC) microgravity experiments, as a subcontractor to Lockheed Martin. The STC Team is shown in the photograph below. This article describes STC's support to the microgravity plant growth experiment.

Cameron Blackford, STC Research Assistant at the NASA-ARC, is working with principal investigator Dr. Gerard Heyenga in designing long-duration microgravity plant cell experiments on the International Space Station (ISS). Dr. Heyenga is a Research Fellow from the University of Colorado, working at NASA-ARC.

Their studies focus on lignin, an important structural component in all plants. It gives trees the support to grow tall and provides the strength to make the wood hard and resistant to damage. However for paper production lignin is not a desirable

component as it discolors the pulp and must be removed at great expense and difficulty. Even a small reduction in the amount of lignin would be of great value for the paper industry and better for the environment.



Cameron Blackford displays 6-cell mini-growth chamber. The upper three cells contain plants in soil; the lower ones use hydrogel, an artificial growth medium.

Previous studies in space have shown that production of lignin is greatly reduced in a microgravity environment. The ISS, along with new gene chip technology, provides an opportunity to identify and examine the genes that control lignin production in plant tissues. The goal is to send up a set of arabidopsis plants to the ISS and allow them

to grow for up to 70 days before the tissue is preserved and returned to earth for gene analysis.

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TruView Introduces PhotoFlair Software

TruView Imaging Co. (TVI), an affiliate of STC, has introduced a new image enhancement software called PhotoFlair. This product features Retinex imaging processing, invented by **Dr. Zia-ur Rahman**, TVI's VP for R&D, and two NASA scientists, and patented by STC and NASA. A free 30-day trial version of PhotoFlair can be downloaded and the unrestricted version can be purchased from www.truview.com. Further details are available on the website.



Zia-Ur Rahman

The technology was developed in the 1990s to improve the clarity of photographs taken during remote sensing of the earth. Rahman worked with Dan Jobson and Glenn Woodell of NASA to create an imaging enhancement technology that would make corrections automatically, yet

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STC Part of U.S. Army Aberdeen Test Center Winning Team



STC employees at NASA-Ames Research Center. Front row, from left to right: Cameron Blackford, Lita Bass, Heather Wilson, Hing Chung. Back row: Dr. Jacob Cohen, Kimberly Wings, Reza Ehsanian.

Aberdeen Test Support Services (ATSS) team consisting of Sverdrup, STC, and Tri-S were the winners of the Aberdeen Test Center (ATC) Engineering Support Services contract. Contract start date was 1 September 2001. STC is a teaming partner and subcontractor to Sverdrup and has 30 new employees on this contract. The ATC contract will come under the Edgewood Regional Office for management purposes.

Harry Kramer has management oversight for this STC program.

At the Aberdeen Test Center STC is involved in all areas of technical testing, much of which includes ballis-

tic performance of munitions and armor protection for U.S. Army vehicles of all types.

(Continued on page 3; see TEAM)



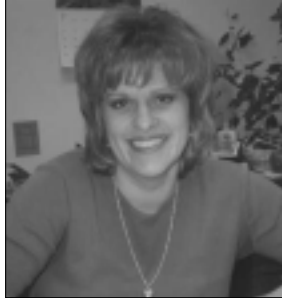
Center: Colonel Mary K. Brown (Commander Aberdeen Test Center). Left to Right: Jim Fasig (Technical Director ATC), Dick Gilligan (STC Vice President and Program Manager STC Edgewood Regional Office), Andy Nicotra (Tri-S Vice President), Larry Graviss (Sverdrup Vice President Test and Evaluation), Steve Hugg (Sverdrup ATSS Program Manager), Dave Robinson (Tri-S President), Harry Kramer (STC Deputy Program Manager), Ralph Rather (Sverdrup ATSS Deputy Program Manager).

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STC Team Provides Administrative Support at the Army Research Laboratory

STC is teamed with Business Plus Corp., an 8(a) company, to provide administrative and editorial support services to the U.S. Army Research Laboratory (ARL), Aberdeen Proving Ground (APG), MD. The contract, currently in its second year, provides professional, administrative, and management support services. These services include technical writers and editorial support, clerical support (word processing, graphic arts services, mail and distribution services) library services, accounting support, reception services, security support, and filing in accordance with the U.S. Army's Modern Army Record Keeping System (MARKS).



Maria Brady,
Technical Writer

STC provides technical writers/editorial support, as well as word processing capability, to ARL scientists, engineers, and researchers and prepares technical documents, papers, presentations, and submissions to a variety of internal and external organizations.

STC currently has 15 employees at ARL: in the Chief of Staff's Office, Weapons and Materials Research Directorate, Survivability/Lethality Analysis Directorate, Computational Information and Sciences Directorate, and the ARL Security Office. The Technical Publications Branch, in particular, maintains a very busy and important role at ARL. Including technical writers, word processors, and clerks, "Tech Pubs" prepares technical reports, papers, articles, and other documents for ARL's scientists, engineers, and researchers.

In FY 2000, the office distributed 534 external publications and almost 300 technical reports, nearly doubling what was distributed in 1998 and 1999 under the previous contractor. A new format for ARL reports has been implemented which not only involved installing the new template into the system and using it on all new reports, but informing the customer as well.

The group's senior technical writer, STC employee **Maria Brady**, started working in Tech Pubs as an Editorial Assistant

10 years ago and was recently promoted to Technical Writer. In addition to providing guidance and assistance to 8 technical writers and word processors, Maria reviews and approves camera-ready reports, distributes the workload, consults with authors when needed, and updates and maintains an in-house style guide to conform to ARL formatting and procedures.

Sandy Fletcher, the Technical Writer Assistant II plays a key role. Sandy worked as an Editor for 27 years at the U.S. Army Ordnance Center and School. After 7 years as an Editorial Assistant with the Tech Pubs Branch, she was promoted to her current position. In addition to her normal duties, Sandy compiles



Sandy Fletcher, Technical
Writer Assistant II

Weapons and Materials Research Directorate's quarterly review and analysis (R&A) and the Survivability/Lethality Analysis Directorate's biannual R&A. She inputs, maintains, and updates one of ARL's newest databases that keeps track of all documents going in and out of all of the directorates. Sandy also uses the Adelphi database to assign report numbers to documents when they are ready to be published.

Since the contract began in January 2000, the BPC/STC team has striven to provide quality clerical and editorial support to its customers. STC has hired three additional employees and promoted nine others as a result of outstanding performance. To date, four STC employees have received letters of appreciation from the customer for their excellent work.

Quebec and Williamsburg Meetings Conducted by STC

- **International Symposium on Spectral Sensing Research**, Quebec City, Canada, 11-15 June 2001.

The ISSSR 2001 was organized by a consortium of U.S. and Canadian government agencies. Symposium co-chairs were Dr. John Ferriter, U.S. Army Soldier and Biological Chemical Command (SBCCOM), and Dr. Denis Faubert, Defence Research Establishment Valcartier. The meeting included a tutorial, poster session, and exhibits, as well as the symposium sessions. STC handled the arrangements and coordination of the meeting under contract with SBCCOM.

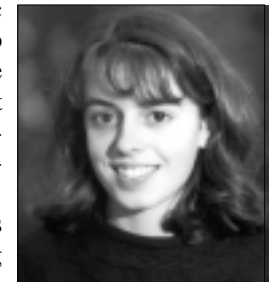
- **Fifth Joint Conference on Standoff Detection for Chemical and Biological Defense**, Williamsburg, VA, 24-28 September 2001. The 5JCSD was sponsored by the Joint Science and Technology Panel on Chemical and Biological Defense in cooperation with the Joint Services and other CB agencies, and chaired by Mr. Kirkman Phelps, SBCCOM. Despite the very recent events at the time, which did cause some travel restrictions and force some cancellations, the conference was successfully held; attendance was very good and the program was not affected. Coordination of 5JCSD was performed under contract with SBCCOM.

AMS/STC Scholarship Award

The American Meteorological Society has named Rebecca J. Stanley of Peterborough, New Hampshire, as the recipient of the STC 2001 Industry Undergraduate Scholarship. Her award was presented to her at the Industry Luncheon during the annual AMS meeting in Orlando in January. Immediately following the luncheon, Ms. Stanley gave an excellent presentation entitled "Forecasting Aircraft Icing in Complex Terrain" at a well attended technical session.

The scholars are invited to attend the week of scientific meetings, and also to participate in the first AMS Student Conference and Career Fair the preceding weekend.

Ms. Stanley is a senior, majoring in meteorology at Plymouth State College, Plymouth, New Hampshire. In addition to being a NASA Grant Scholarship winner, Rebecca is a trained EMT, volunteering at the local fire department in Petersborough. She is also a camping and hiking enthusiast.



Rebecca J. Stanley

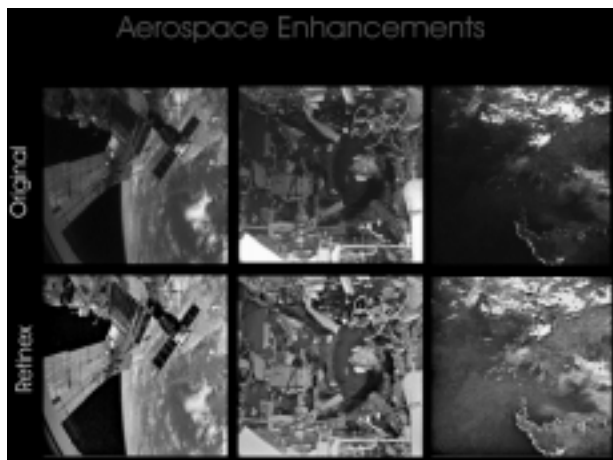
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allow the end user to manipulate the image as desired. It was impressive enough to win a NASA Space Act Award as one of the Agency's top inventions of 1999.

As Woodell has said, "What makes Retinex technology so valuable is that every image can stand a little improving, especially dark, low contrast images."



snapping a picture will let Retinex finish the job," Rahman says. It will especially help weekend photographers who use the increasingly popular digital format. In addition, it will help improve detection of minute tumors in medical MRIs or X-rays.

TEAM (Continued from page 1)

The ATSS team, consisting of an integrated contractor group, provides Test Support Services for ATC at Aberdeen Proving Ground, Maryland. ATC is a DoD Major Range and Test Facility (MRTFB) and as a Federal Laboratory provides a full range of test services not only to DoD agencies, but also to federal, state and local governments, academia, private industry, and foreign governments. The ATSS team delivers personnel, management, transportation, material, and equipment to perform test support functions as an integrated part of Team ATC. The test support function capability of the ATSS team includes a wide range of support for ATC:

- Comprehensive array of capabilities, unique facilities, simulators and models enables testing and experimentation from the component level up to entire systems.
- Testing of a broad spectrum of military weapon systems and equipment including tracked and wheeled vehicles, guns, ammunition, bridges, generators, night vision devices, individual equipment (boots, helmets, etc.), material handling equipment, surface and underwater naval systems.
- Capability to subject test items to a full range of tests from automotive endurance and full weapons performance with environmental extremes to live fire vulnerability, survivability and lethality testing.

Supporting the ATC Automotive, Firepower, Survivability/Lethality, Technology and Warfighter Cores of excellence, ATSS

team has established capabilities in the following areas: Automotive Test Operation and Maintenance; Weapon Test Operation and Maintenance; Test Instrumentation and Technology; and Environmental and Command Staff Support.

Tasks that STC will perform in these areas will include logistic and administrative support; operation, storage, and maintenance of test items; preparation and support of laboratories and ranges; conduct of tests and collections of data; and preparation of reports.

Honors and Awards

NASA, JPL, and CloudSat Project Cite Phil Partain

Phil Partain of STC-METSAT received a "Recognition of Excellence" award from NASA, the Jet Propulsion Laboratory (JPL) and the CloudSat Project in appreciation and recognition for his innovative contribution to CloudSat by developing the Algorithm Interface Management System (AIMS), a tool that will facilitate the construction of the CloudSat data processing system.

The CloudSat data processing system will include computer program modules developed at JPL, the University of Utah, and Colorado State University (CSU) that will work together to produce science data products. The modules will be run sequentially and each will create data products that serve as input to downstream modules.



Phil Partain

EXPERIMENT (Continued from page 1)

Numerous challenges need to be met when designing an experiment for the space environment: what medium to grow the plants in and how to supply them food, water, and light for their extended stay in space. For example, environmental conditions like temperature, day length, and atmospheric composition must also be considered. Even such things as making sure the shoots grow up and the roots grow down can be difficult in a microgravity environment. All these factors are further complicated by the limitations on available space, energy, and manpower in the Space Station environment.

Testing of different varieties of arabidopsis and proper seed orientation for good growth have already been completed, as has testing of various natural and artificial media to use as growth media for plants. The ideal material would be something that can hold a lot of water without losing its structure and can be dried and rehydrated. This would allow the control of the exposure of seeds to moisture and thus control the timing of plant germination. The use of LEDs and microfluorescents as sources of light are also being tested. A light source is needed that uses a minimum of power and does not produce a lot of heat, but provides enough light for the plants to grow. The effects of different amounts of light on plant growth and health is important.

The launch is scheduled in late Spring of 2002 with a return date approximately 70 days later.

Blackford, who joined STC from the USDA, holds an M.S. in Applied Ecology.

AIMS is a web-based application that allows the code developers to define data output information for their modules and provides the functionality to ensure the availability of input data. The system includes automatic error checking on data specifications and has an integrated change log that notifies downstream users of updates on previously entered fields. AIMS will serve as the primary information source and configuration control mechanism for interfacing the modules and integrating them into the CloudSat data processing system.

STC-METSAT's role on the CloudSat Project Team is to provide specialized development support for the Science Data (continued on page 4; see **HONORS/AWARDS**)

STC Recognizes Staff For Their Years of Dedicated Service

STAFF WITH OVER 20 YEARS OF SERVICE



Marlene "Sue" Crotts,
Administrative Supervisor 1977



Dr. Pi-Huan Wang, Senior Scientist
1979



Dr. Geoffrey Kent, Senior Scientist
1980



Diana McQuestion, Publications and
Meetings Manager 1981

STAFF WITH 15 TO 20 YEARS OF SERVICE



Sidney Gerard, Senior Scientist/Deputy
Program Manager 1984



Julet "Judy" Cole, Meetings Coordinator
1985



Margaret "Maggie" Jones,
Junior Financial Specialist 1986

HONORS/AWARDS (continued from page 3)

Processing segment of the Mission. Following CloudSat launch in April, 2004, STC-METSAT will support CSU data processing operations for several years.

Several STC scientists have received NASA Group Achievement Awards. **Dr. Geoffrey Kent, Dr. Gary Hansen, and Pat Lucker** were presented with an award for their "exceptional achievement in the de-

sign, development, and implementation of a new airborne aerosol and polar stratospheric cloud lidar system" while working on the Aerosol and Polar Stratospheric Clouds Lidar Team.

Mulugeta Petros, STC Engineer at NASA Langley, was selected to receive a Group Achievement Award for his "significant performance and dedicated contributions." He received the NASA Team Awards for the Multifunctional and the Double Pulsed Laser Technology, both

having been selected for Flight System Innovation Awards. These awards were presented by Dr. Chris A. Hostetler of NASA Langley Research Center.

Lucker, Hansen, and Kent were also selected for the NASA Ames award "in recognition of outstanding accomplishments and contributions to the extremely successful SAGE III Ozone Loss and Validation Experiment (SOLVE) conducted in Kiruna, Sweden."

STC is proud to congratulate these outstanding individuals.



Dr. George Wood, Dr. Adarsh Deepak, Pat Lucker, Dr. Gary Hansen, Mulugeta Petros (STC) and Dr. Chris Hostetler (NASA).



Dr. Adarsh Deepak, STC President, presenting NASA Ames award to Dr. Geoffrey Kent.