cation of the user interface have all reduced the required workforce to run 70-meter antennas. The ALC also increases the antenna availability by reducing the time required to start up the antenna, to diagnose faults, and by providing additional insight into the performance of key parameters that aid in preventive maintenance to avoid key element failure.

The ALC User Display (AUD) is a graphical user interface with hierarchical display structure, which provides high-level status information to the operation of the ALC, as well as detailed information for virtually all aspects of the ALC via drill-down displays. The operational status of an item, be it a function or assembly, is shown in the higher-level display. By pressing the item on the display screen, a new screen opens to show more detail of the function/assembly. Navigation tools and the map button allow immediate access to all screens.

This program was written by Harlow Ahlstrom, Scott Morgan, Peter Hames, Martha Strain, Christopher Owen, and Kenneth Shimizu of Caltech; Karen Wilson, David Shaller, and Said Doktormomtaz of Modern Technologies Corp.; and Patrick Leung of Northrop Grumman Corp. for NASA's Jet Propulsion Laboratory.

This software is available for commercial licensing. Please contact Karina Edmonds of the California Institute of Technology at (626) 395-2322. Refer to NPO-44341.

Modeling Carbon and Hydrocarbon Molecular Structures in EZTB

NASA's Jet Propulsion Laboratory, Pasadena, California

A software module that models the electronic and mechanical aspects of hydrocarbon molecules and carbon molecular structures on the basis of first principles has been written for incorporation into, and execution within, the Easy (Modular) Tight-Binding (EZTB) software infrastructure, which is summarized briefly in the immediately preceding article. Of particular interest, this module can model carbon crystals and nanotubes characterized by various coordinates and containing defects, without need to adjust parameters of the physical model.

The module has been used to study the changes in electronic properties of carbon nanotubes, caused by bending of the nanotubes, for potential utility as the basis of a nonvolatile, electric-charge-free memory devices. For example, in one application of the module, it was found that an initially 50-nm-long carbon, (10,10)-chirality nanotube, which is a metallic conductor when straight, becomes a semiconductor with an energy gap of ≈3 meV when bent to a lateral displacement of 4 nm at the middle.

This program was written by Seungwon Lee and Paul von Allmen of Caltech for NASA's Jet Propulsion Laboratory.

This software is available for commercial licensing. Please contact Karina Edmonds of the California Institute of Technology at (626) 395-2322. Refer to NPO-44781.

BigView Image Viewing on Tiled Displays

Ames Research Center, Moffett Field, California

BigView allows for interactive panning and zooming of images of arbitrary size on desktop PCs running Linux. Additionally, it can work in a multi-screen environment where multiple PCs cooperate to view a single, large image. Using this software, one can explore — on relatively modest machines — images such as the Mars Orbiter Camera mosaic [92,160×33,280 pixels].

The images must be first converted into "paged" format, where the image is stored in 256×256 "pages" to allow rapid movement of pixels into texture memory. The format contains an "image pyramid": a set of scaled versions of the original image. Each scaled image is 1/2 the size of the previous, starting with the original down to the smallest, which fits into a single 256×256 page.

This program was written by Timothy Sandstrom of Advanced Management Technology for Ames Research Center. For further information, access http://opensource.arc.nasa.gov/ or contact the Ames Technology Partnerships Division at (650) 604-2954. ARC-15277-1

Imaging Sensor Flight and Test Equipment Software

Marshall Space Flight Center, Alabama

The Lightning Imaging Sensor (LIS) is one of the components onboard the Tropical Rainfall Measuring Mission (TRMM) satellite, and was designed to detect and locate lightning over the tropics. The LIS flight code was developed to run on a single onboard digital signal processor, and has operated the LIS instrument since 1997 when the TRMM satellite was launched.

The software provides controller functions to the LIS Real-Time Event Processor (RTEP) and onboard heaters, collects the lightning event data from the RTEP, compresses and formats the data for downlink to the satellite, collects housekeeping data and formats the data for downlink to