building on existing investments in *in situ* space geodetic networks, and improving timeliness, quality, and science value of the collected data.

This work was done by Angelyn W. Moore, Frank H. Webb, Evan F. Fishbein, Eric J. Fielding, Susan E. Owen, and Stephanie L. Granger of Caltech; Fredrik Björndahl and Johan Löfgren of Chalmers University of Technology; and Peng Fang, James D. Means, Yehuda Bock, and Xiaopeng Tong of UC San Diego's Scripps Institution of Oceanography for NASA's Jet Propulsion Laboratory. Further information is contained in a TSP (see page 1).

This software is available for commercial licensing. Please contact Dan Broderick at Daniel.F.Broderick@jpl.nasa.gov. Refer to NPO-48556.

Ionospheric Specifications for SAR Interferometry (ISSI)

NASA's Jet Propulsion Laboratory, Pasadena, California

The ISSI software package is designed to image the ionosphere from space by calibrating and processing polarimetric synthetic aperture radar (PolSAR) data collected from low Earth orbit satellites. Signals transmitted and received by a PolSAR are subject to the Faraday rotation effect as they traverse the magnetized ionosphere. The ISSI algorithms combine the horizontally and vertically polarized (with respect to the radar system) SAR signals to estimate Faraday rotation and ionospheric total electron content (TEC) with spatial resolutions of sub-kilometers to kilometers, and to derive radar system calibration parameters. The ISSI software package has been designed and developed to integrate the algorithms, process PolSAR data, and image as well as visualize the ionospheric measurements.

A number of tests have been conducted using ISSI with PolSAR data collected from various latitude regions using the phase array-type L-band synthetic aperture radar (PALSAR) onboard Japan Aerospace Exploration Agency's Advanced Land Observing Satellite mission, and also with Global Positioning System data. These tests have demonstrated and validated SAR-derived ionospheric images and data correction algorithms.

This work was done by Xiaoqing Pi, Bruce D. Chapman, Anthony Freeman, Walter Szeliga, Sean M. Buckley, Paul A. Rosen, and Marco Lavalle of Caltech for NASA's Jet Propulsion Laboratory. For more information, contact iaoffice@jpl.nasa.gov.

This software is available for commercial licensing. Please contact Dan Broderick at Daniel.F.Broderick@jpl.nasa.gov. Refer to NPO-48351.

Implementation of a Wavefront-Sensing Algorithm

Goddard Space Flight Center, Greenbelt, Maryland

A computer program has been written as a unique implementation of an image-based wavefront-sensing algorithm reported in "Iterative-Transform Phase Retrieval Using Adaptive Diversity" (GSC-14879-1), *NASA Tech Briefs*, Vol. 31, No. 4 (April 2007), page 32. This software was originally intended for application to the James Webb Space Telescope, but is also applicable to other segmented-mirror telescopes.

The software is capable of determining optical-wavefront information using, as input, a variable number of irradiance measurements collected in defocus planes about the best focal position. The software also uses input of the geometrical definition of the telescope exit pupil (otherwise denoted the pupil mask) to identify the locations of the segments of the primary telescope mirror. From the irradiance data and mask information, the software calculates an estimate of the optical wavefront (a measure of performance) of the telescope generally and across each primary mirror segment specifically. The software is capable of generating irradiance data, wavefront estimates, and basis functions for the full telescope and for each primary-mirror segment. Optionally, each of these pieces of information can be measured or computed outside of the software and incorporated during execution of the software.

This program was written by Jeffrey S. Smith, Bruce Dean, and David Aronstein of Goddard Space Flight Center. Further information is contained in a TSP (see page 1). GSC-15399-1

Sally Ride EarthKAM — Automated Image Geo-Referencing Using Google Earth Web Plug-In

NASA's Jet Propulsion Laboratory, Pasadena, California

Sally Ride EarthKAM is an educational program funded by NASA that aims to provide the public the ability to picture Earth from the perspective of the International Space Station (ISS). A computer-controlled camera is mounted on the ISS in a nadir-pointing window; however, timing limitations in the system cause inaccurate positional metadata. Manually correcting images within an orbit allows the positional metadata to be improved using mathematical regressions. The manual correction process is time-consuming and thus, unfeasible for a large number of images.

The standard Google Earth program allows for the importing of KML (keyhole markup language) files that previ-