lipse with the Sun at the focus; and (3) the arrival phase, in which the two bodies are the target planet and the spacecraft, where the trajectory is an arrival hyperbola with the planet as the focus.

This work was done by Brooke Anderson Park and Henry Wright of Langley Research Center. Further information is contained in a TSP (see page 1). LAR-17446-1

Ring Image Analyzer

Ring Image Analyzer software analyzes images to recognize elliptical patterns. It determines the ellipse parameters (axes ratio, centroid coordinate, tilt angle). The program attempts to recognize elliptical fringes (e.g., Newton Rings) on a photograph and determine their centroid position, the short-to-long-axis ratio, and the angle of rotation of the long axis relative to the horizontal direction on the photograph. These capabilities are important in interferometric imaging and control of surfaces. In particular, this program has been developed and applied for determining the rim shape of precision-machined optical whispering gallery mode resonators.

The program relies on a unique image recognition algorithm aimed at recognizing elliptical shapes, but can be easily adapted to other geometric shapes. It is robust against non-elliptical details of the image and against noise.

Interferometric analysis of precision-machined surfaces remains an important technological instrument in hardware development and quality analysis. This software automates and increases the accuracy of this technique. The software has been developed for the needs of an R&TD-funded project and has become an important asset for the future research proposal to NASA as well as other agencies.

This work was done by Dmitry V. Strekalov of Caltech 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 Daniel Broderick of the California Institute of Technology at danielb@caltech.edu. Refer to NPO-47579.

SureTrak Probability of Impact Display

The SureTrak Probability of Impact Display software was developed for use during rocket launch operations. The software displays probability of impact information for each ship near the hazardous area during the time immediately preceding the launch of an unguided vehicle.

Wallops range safety officers need to be sure that the risk to humans is below a certain threshold during each use of the Wallops Flight Facility Launch Range. Under the variable conditions that can exist at launch time, the decision to launch must be made in a timely manner to ensure a successful mission while not exceeding those risk criteria. Range safety officers need a tool that can give them the needed probability of impact information quickly, and in a format that is clearly understandable. This application is meant to fill that need.

The software is a reuse of part of software developed for an earlier project: Ship Surveillance Software System (S4). The S4 project was written in C++ using Microsoft Visual Studio 6. The data structures and dialog templates from it were copied into a new application that calls the implementation of the algorithms from S4 and displays the results as needed. In the S4 software, the list of ships in the area was received from one local radar interface and from operators who entered the ship information manually. The SureTrak Probability of Impact Display application receives ship data from two local radars as well as the SureTrak system, eliminating the need for manual data entry.

This work was done by John Elliott of Goddard Space Flight Center. Further information is contained in a TSP (see page 1). GSC-16064-1