

Abstract for 1994 IAF

**PLUTO FAST FLYBY MISSION ADVANCED TECHNOLOGIES:  
REQUIREMENTS AND PROGRESS**

by

Robert L. Staehle\* and Rex W. Ridenoure<sup>+</sup>

Jet Propulsion Laboratory, California Institute of Technology  
Pasadena, CA 91109 USA

A development team at the Jet propulsion Laboratory (JPL) and other facilities is designing a mission to send two very small spacecraft to Pluto and Charon to complete the initial reconnaissance of our solar system. The two probes will obtain science data on both hemispheres of these remote bodies in the form of visual images, infrared and ultraviolet data, and radio science. The development team must generate a viable mission design, spacecraft design and operations concept which collectively meet challenging cost, schedule and performance constraints, in that priority. Key features of the baseline mission approach include two identical, very small, 120-kg-class spacecraft launched on approximately 7-10 year direct trajectories to the Pluto-Charon system and the use of novel, low-cost mission and spacecraft development and operations techniques. Approximately one dozen advanced technologies required to realize this mission have been identified and prioritized with respect to how strongly they drive mission life-cycle cost, spacecraft mass (and thus trip time to Pluto), mission performance, operational complexity, and mission risk. Various efforts are underway to develop, prototype and demonstrate these critical technologies in advance of an anticipated technology freeze date in 1996. Another dozen or so highly desirable advanced technologies are also under consideration for development. This paper briefly describes the baseline Pluto Fast Flyby mission design and system elements, describes the required and desired advanced technologies and proposed implementation approach, and reports on developmental progress for each.

---

\* Manager, Pluto Pre-Project

+ Pluto Pre-Project Technologist