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# Simplex: A Program of Inexpensive Planetary Exploration

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ABSTRACT

SIMPLEX

A Program of Inexpensive Planetary Exploration

by

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During the 1960's and 70's the United States sent a multitude of small spacecraft on interplanetary and lunar flights. These early probes were used as simple precursors for the larger more sophisticated interplanetary vehicles that followed. Although the larger vehicles were extremely successful and scientifically rewarding, they were also very costly. Today, there are fewer planetary missions and even these have come under tight budgetary restrictions. Although the National Commission on Space and the NASA Solar System Exploration Committee have identified a series of goals for the planetary exploration program, some of those goals could be compromised due to budget considerations related to the use of large and expensive vehicles. This paper proposes that a program utilizing a series of Small Inexpensive Modular Planetary and Lunar EXplorer (SIMPLEX) spacecraft be created. The goal of this program would be to supplement large expensive spacecraft with small inexpensive ones. A set of common spacecraft busses, with off-the-shelf propulsion, power, data, and communications systems would be used as the core vehicles. Simple scientific instruments are integrated into the standard bus for each mission. All of the SIMPLEX spacecraft can be launched on a variety of launch vehicles. Several of these spacecraft have already been designed and built, such as the Orion, from the Naval Postgraduate School, and the Lunar Get Away Special project from the Jet Propulsion Laboratory. The SIMPLEX program would use several of these spacecraft to explore the Moon, Mars and small near-Earth objects such as asteroids and comets. Such a program could be established for a relatively low cost and would augment existing and future planetary exploration programs.