

23rd IAA SYMPOSIUM ON HUMAN EXPLORATION OF THE SOLAR SYSTEM (A5)
Space Transportation Solutions for Deep Space Missions (4-D2.8)

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STRUCTURAL PROTOTYPE DESIGN OF DEEP SPACE (SP-DDS) EXPLORATION AND CARGO
SPACECRAFT

Abstract

Deep space exploration is a technological challenge but also provides equivalent opportunities to understand new realms of the universe. There have been multiple research in development of Deep Space Spacecraft with milestone of IKAROS in 2010 to Venus. There has been a constant research since then to develop various prototype that are economical, durable, lighter and reliable as its major features. Advent of newer technology and efforts for establishment are being studied for mars and moon, this would soon arise need for deep space exploration spacecraft's. This includes movement of personal as well as samples and materials between celestial bodies such as use of helium-3 as a green nuclear fuel found on moon. Therefore, study therefore focuses on enhancing the structural durability and reliability while it maintains a lightweight profile. The prototype development of SP-DDS were based on understanding the present available literature on technologies for propulsion, life support and communication to propose a design for a deep space spacecraft. The design focused towards three basic flight manoeuvres round-trip planetary missions, rendezvous and flyby for exploration and cargo transfer in future. Further, an estimate of the feasibility of SP-DDS has been discussed for its functional advantages and disadvantages. The overall goal of the study demonstrates a new prototype design in deep space exploration as an innovation for further developing new strategies in new era of interstellar space missions. Key words; Solar system exploration, Spaceflight, Structure, Propulsion, Spacecraft