

SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND
DEVELOPMENT (D3)

Systems and Infrastructures to Implement Future Building Blocks in Space Exploration and Development
(2)

Author: Mr. Sebastian M. Ernst
Deep Space Industries Inc., Germany, info@s-m-ernst.de

Mr. James D. DiCorcia
Deep space Industries, United States, james.dicorcia@deepspaceindustries.com
Mr. David Gump
Deep Space Industries Inc., United States, david.gump@deepspaceindustries.com
Dr. John Lewis
Deep Space Industries Inc., United States, john.lewis@deepspaceindustries.com
Mr. Craig F. Foulds
Deep space Industries, United States, craig.foulds@deepspaceindustries.com
Mr. Daniel Faber
Deep Space Industries Inc., United States, daniel.faber@deepspaceindustries.com
Mr. Sagi Kfir
Deep Space Industries Inc., United States, sagi.kfir@deepspaceindustries.com

THE MOTHERSHIP MISSION ARCHITECTURE

Abstract

Deep Space Industries (DSI) is currently developing a mission concept that enables a broad participation in the scientific exploration of small bodies - the Mothership mission architecture. The Mothership is considered to be a dedicated deep space carrier spacecraft. It shall deliver third-party nano-sats, experiments and instruments to Near Earth Asteroids (NEOs), comets or moons. The Mothership service includes delivery of nano-sats, communication to Earth and visuals of the asteroid surface and surrounding area. The Mothership is designed to carry about 10 nano-sats, based upon a variation of the Cubesat standard, with some flexibility on the specific geometry. The Deep Space Nano-Sat reference design is a 14.5 cm cube, which accommodates the same volume as a traditional 3U CubeSat. To reduce cost, Mothership is designed as a secondary payload aboard launches to GTO. DSI is offering slots for nano-sats to individual customers. This enables organizations with relatively low operating budgets to closely examine an asteroid with highly specialized sensors of their own choosing and carry out experiments in the proximity of or on the surface of an asteroid, while the nano-sats can be built or commissioned by a variety of smaller institutions, companies, or agencies. While the overall Mothership mission will have a financial volume somewhere between a European Space Agencies' (ESA) S- and M-class mission for instance, it can be funded through a number of small and individual funding sources and programs, hence avoiding the processes associated with traditional space exploration missions. DSI has started to actively promote the concept in mid-2014 and has since been able to identify a significant interest in the planetary science and nano-satellite communities.