

17th IAA SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND
DEVELOPMENT (D3)

Strategies & Architectures as the Framework for Future Building Blocks in Space Exploration and
Development (1)

Author: Dr. Dan Rasky

NASA Ames Research Center, United States, daniel.j.rasky@nasa.gov

Mr. Lynn Harper

NASA, United States, lynn.harper@nasa.gov

Mr. Robert Pittman

NASA Ames Research Center, United States, robert.b.pittman@nasa.gov

Dr. Allison Zuniga

NASA Ames Research Center, United States, allison.f.zuniga@nasa.gov

STRATEGIC SPACE RESOURCES: A KEY STRATEGY FOR PURSUING SUSTAINABLE SPACE
EXPLORATION AND DEVELOPMENT

Abstract

Strategic space resources provide an essential new organizing element for planning and funding future space exploration and development. More and more minerals and elements that are essential to current industrial production and prosperity are becoming increasingly scarce in most industrialized nations – this also includes non-polluting and sustainable energy sources. Increasing scarcity of these important materials and resources will put increasing pressure to locate and assess possible new sources from new and novel locations. One very important new and novel location is the vast expanse of space, with its boundless elements, minerals and energy sources.

What is essential now is to undertake a serious stepwise plan to locate and evaluate important strategic space resources in the vicinity of Earth, on the Moon and from near-Earth asteroids. This evaluation would include remote observation, ground truth assessments, and select pilot extractions and operational demonstrations to establish proven reserves, show technical feasibility, and provide key financial information. This would then underpin feasibility assessments crucial for full scale production which could enable economically sustainable space activities.

This paper will examine these steps in detail and layout an approach using strategic space resources to help guide investments and planning for future space exploration and development activities.