

Innovative Approaches to Space-Based Manufacturing and Rapid Prototyping of Composite Materials

The ability to deploy large habitable structures, construct, and service exploration vehicles in low earth orbit will be an enabling capability for continued human exploration of the solar system. It is evident that advanced manufacturing methods to fabricate replacement parts and re-utilize launch vehicle structural mass by converting it to different uses will be necessary to minimize costs and allow flexibility to remote crews engaged in space travel. Recent conceptual developments and the combination of inter-related approaches to low-cost manufacturing of composite materials and structures are described in context leading to the possibility of on-orbit and space-based manufacturing.