

SPACE POWER SYMPOSIUM (C3)
Space-Based Solar Power Architectures / Space & Energy Concepts (1)

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KEYNOTE: IMPLICATIONS OF ADVANCES IN HYPER-MODULAR SPACE SOLAR POWER
ARCHITECTURES FOR TERRESTRIAL ENERGY AND THE DEVELOPMENT & SETTLEMENT
OF SPACE

Abstract

During 2008-2011, the International Academy of Astronautics (IAA) accomplished the First International Assessment of Space Solar Power, involving diverse subject matter experts (SMEs) from some ten (10) countries. The IAA assessment found that SSP is technically feasible and that it might be realized in as little as 10-15 years. Following on those results, in 2011-2012 an international team, working under the auspices of NASA's Innovative Advanced Concepts (NIAC) program examined a novel, more practical hyper-modular approach to realizing SSP: "SPS-ALPHA" (Solar Power Satellite by means of Arbitrarily Large Phased Array), invented by the author. In the past several years, new ideas for SSP in general and improvements in the SPS-ALPHA concept in particular have emerged. These include related developments in space and terrestrial technologies (e.g., reusable launch systems), new SSP activities internationally (e.g., new commercial efforts), as well as innovations in how SSP might be accomplished (e.g., in-space fabrication). Moreover, in recent years a tremendous interest has emerged in prospects for the development of space resources and the pursuit of the eventual settlement of the Moon, Mars and locations in Cis-Lunar space and across the inner Solar System.

This paper will review recent advances in space solar power concepts, particularly the SPS-ALPHA approach, and will focus on the implications of recent advances in hyper-modular space solar power architectures for both terrestrial energy and for the future development and settlement of space.