

IAF SPACE POWER SYMPOSIUM (C3)
Solar Power Satellite (1)

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POWERING SPACE: ADVANCES IN CONCEPTS FOR & APPLICATIONS OF SOLAR POWER
SATELLITES**Abstract**

Recently a variety of new architectural concepts for the Solar Power Satellite have emerged that may enable a much wider range of applications than previously considered. Space solar power (SSP) is often discussed only in the context of its prospective use for markets on Earth; however, there is no single more important source of energy for use elsewhere in our Solar System than the Sun itself. The environments that exist on the surface of Earth's Moon, at the orbit of Mars and on its surface, in the main belt asteroids, and the among the moons of Gas Giants differ dramatically from one another. As a result, nuclear power systems of one sort or another have typically been discussed for mission applications on the Moon or Mars, or in space beyond the asteroids. However, one characteristic that all have in common: freely available sunlight – admittedly at decreasing intensity with increasing distance. At an entirely greater order of difficulty, the challenge of transportation beyond our solar system is now being discussed seriously by several strategic programs. This paper will review ambitious energy requirements for a variety of candidate missions and markets – focusing on power for Earth, but addressing on the Moon, the Mars system, the asteroids and targets beyond. It will examine the potential for various SSP system concepts to meet those energy requirements and it will compare a number of options. The paper will conclude with a roadmap forward, setting into an integrated framework the potential for SSP to truly “Power Space” during the coming century.