Integrated Space Solar Power Station

What is a space solar power station called Omega?
The space solar power station (SSPS) capable of providing earth with primary power has been researched for 50 years. The SSPS is a tremendous design involving optics, mechanics, electromagnetism, thermology, control, and other disciplines. This paper presents a novel design project for SSPS named OMEGA.

What is SSPs-Omega solar power station?
The SSPS-OMEGA (Space Solar Power Station via Orb-shape Membrane Energy Gathering Array) concept can be described as a modular,spherical system concept in which sunlight is collected with the main reflector and power is generated in a series of PV cell array.

Can SSPs supply energy by solar array?
Supplying energy by PV array to the robots would bring lots of problems. The SSPS is such a large energy generator itself,so we considered supplying energy to the fleet by the solar array modules. The energy will be supplied by storage battery and PV cells on body in addition instead of solar wings.

Can SSPs assemble a 100-meter-scale space structure in orbit?
As a first step, we have been researching a robotic assembly technology capable of assembling a 100-meter-scale space structure in orbit. Many studies have been conducted on SSPS concepts and technologies in Japan and overseas. The section summarizes the history, advantage, and challenges of the SSPS.

Is SSPs a complex space system?
Conclusions The SSPS is an extremely complex space system. There are various difficulties in assembly technology. Aiming at different demands in each subsystem,specific docking procedures are designed to satisfy the mechanical and docking interface requirements.

How much energy does it take to assemble SSPs?
The antenna structure costs the most time and energy to assemble,requiring almost 400 h and 8600 kW h. The main truss costs 400 h to assemble,while the solar array system costs more energy than the main truss system. The entire assembly mission for the symmetric platform SSPS costs 1153 h of time and 18.467 MW hof energy. 5. Conclusions

Space solar power satellites require innovative concepts in order to achieve economically and technically feasible designs. The mass and volume constraints of current and planned launch vehicles necessitate highly efficient structural systems be developed. In addition, modularity and in-space deployment will be enabling design attributes.

Practical space-based energy harvesting requires a large structure to make the microwave power transferring

beam localized to a small area on Earth. A thin foldable membrane satellite is proposed to reduce the cost of building this structure. The membrane is formed by the solar cell and antenna array, but since they exist on the same plane, the solar cell area is reduced to ...

Space solar power satellite (SSPS) is a tremendous energy system that collects and converts solar power to electric power in space, and then transmits the electric power to earth wirelessly. In this paper, a novel SSPS concept based on ?-near-zero (ENZ) metamaterial is proposed. A spherical condenser made of ENZ metamaterial is developed, by ...

The Space Solar Power Station (SSPS) is a large spacecraft that utilizes solar power in space to supply power to an electric grid on Earth. A large symmetrical integrated concept has been proposed by the China Academy of Space Technology (CAST). Considering its large scale, the SSPS requires a modular design and unitized general interfaces that ...

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???????(Space solar Power Station, SPS),??????????????????????????,???????????????? ??????? ...

CAST vice-president Li Ming was quoted as saying China expects to be the first nation to build a working space solar power station with practical value. Chinese scientists were reported as planning to launch several small- and medium ...

The Value of Our Research. The SSPS has many advantages as follows: it provides power 24 hours a day without being affected by weather conditions, unlike terrestrial renewable energy sources; the solar irradiance in space is ...

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