

Caltech solar power satellite

Detecting power from MAPLE on the roof of Moore Laboratory. Credit: Ali Hajimiri / Caltech. Ibadan, 19 June 2023. - California Institute of Technology (Caltech) has demonstrated the ability to transmit power in space wirelessly and to beam detectable power to Earth through a space solar power prototype that the University launched. Researchers launched the satellite ...

A space solar power prototype has demonstrated its ability to wirelessly beam power through space and direct a detectable amount of energy toward Earth for the first time.

Image credit: Caltech/Space Solar Power Program. The origins of SSPP date back to 2011, ... when a trial satellite orbiting at a distance of around 400km will test the technology used to transmit energy from the power plant to Earth. In addition, the UK has also commissioned independent research supporting a £1.6bn British version of a solar ...

A space solar power prototype that was launched into orbit in January is operational and has demonstrated its ability to wirelessly transmit power in space and to beam detectable power to Earth for the first time. Wireless power transfer was demonstrated by MAPLE, one of three key technologies being tested by the Space Solar Power Demonstrator (SSPD-1), the ...

Ali Hajimiri is the codirector of Caltech's space-based solar power project. Caltech. ... There are some other major differences between the Caltech power satellite design and the other concepts ...

An orbital satellite testing the technological feasibility of one day harvesting and transmitting solar energy down to Earth has concluded its year long mission, and researchers ...

Intrigued by the potential for space solar power, Bren approached Caltech's then-president Jean-Lou Chameau in 2011 to discuss the creation of a space-based solar power research project. In the years to follow, Bren and his wife, Brigitte Bren, a Caltech trustee, agreed to make a series of donations (yielding a total commitment of over \$100 ...

Wireless Power Transfer. We focus on various strategies and techniques for ultralight-weight mid- and long-range wireless power transfer, including using flexible phased arrays systems at various frequencies that can convert, transfer, and recover energy effectively and safely to locations in need of power. We perform advanced research on ...

Preparing Caltech's Space Solar Power Demonstrator satellite for launch, which was flown to orbit on 3 January 2023. The personnel seen here are lowering a deployable solar panel and power transmitter structure over the main body of the satellite.

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The spaceborne testbed demonstrated the ability to beam power wirelessly in space; it measured the efficiency, durability, and function of a variety of different types of solar ...

Caltech has beamed solar power from a satellite to the Earth, for the first time. In the Maple (Microwave Array for Power-transfer Low-orbit Experiment) project, a satellite collected solar power and beamed a detectable amount to the roof of the US university. It is the first step in an ambitious project to harvest solar power from space.

This paper describes Caltech's Space Solar Power Demonstration One (SSPD-1) payload and upcoming mission on Momentus Space Vigoride 5. SSPD-1 is comprised of three experiments each of which ...

A space solar power prototype that was launched into orbit in January is operational and has demonstrated its ability to wirelessly transmit power in space and to beam detectable ...

Launched in January, SSPD-1 is the first spaceborne prototype from Caltech's Space Solar Power Project (SSPP). It carries three onboard experiments, each designed to test key technologies for an orbital power station capable of harvesting sunlight in space and directing it down to Earth.

In collaboration with the Caltech Space Solar Power Project, our research investigates concepts of operations for planar space solar power satellites. The baseline planar space solar power satellite architecture under consideration consists of lightweight, planar elements that integrate photovoltaic (PV) cells, direct current to microwave ...

Space-Based Solar Power . Erica Rodgers, Ellen Gertsen, Jordan Sotudeh, Carie Mullins, Amanda Hernandez, Hanh Nguyen Le, Phil Smith, and Nikolai Joseph "A new concept of solar power satellite: Tethered-SPS" Acta Astronautica 60 (2006) 153-165 and Pellegrino et al. "A lightweight space-based solar power generation and transmission ...

A NASA artist's rendering from 1999 of a solar power station in orbit. Like many other space-based solar designs, it required many connected parts, which translates to considerable launch costs ...

SSPP aims to develop a PV cell with an efficiency level of 25 percent that is 100 times less expensive (\$100 per square meter), 40 times lighter (0.05 kilograms per square ...

SSPD-1 is the first spaceborne prototype from Caltech's Space Solar Power Project (SSPP). [Caltech story] On a cool, clear evening in May 2023, Caltech electrical engineer Ali Hajimiri and four members of his lab gathered on the roof of the Gordon and Betty Moore Laboratory of Engineering to await a signal from the heavens. In preparation ...



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Caltech Space Solar Power Project", 2018 . 6th IEEE International Conference on . Wireless for Space and Extreme Space-based solar power (SBSP or Solar Power Satellite - SPS) refers to the ...

A lightweight tile structure integrating photovoltaic conversion and RF power transfer for space solar power applications. SciTech 2018. Orlando (FL), AIAA-2018-2022. Leclerc, C., Pedivellano, A. and Pellegrino, S. (2018). Stress concentration and material failure during coiling of ultrathin TRAC booms. SciTech 2018. Orlando (FL), AIAA-2018-0690

A satellite launched by the California Institute of Technology (Caltech) has successfully received and transmitted solar power back to Earth, the first time solar power has been transmitted to ...

Oxfordshire-based Space Solar estimates that a solar power-generating satellite would produce energy at a cost of just \$34 per megawatt hour by 2040 to break even over its lifetime, against \$43 ...

One year ago, Caltech's Space Solar Power Demonstrator (SSPD-1) launched into space to demonstrate and test three technological innovations that are among those necessary to make space solar power a reality. The spaceborne testbed demonstrated the ability to beam power wirelessly in space; it measured the efficiency, durability, and function of a variety of different ...

In January 2023, the Caltech Space Solar Power Project (SSPP) is poised to launch into orbit a prototype, dubbed the Space Solar Power Demonstrator (SSPD), which will test several key ...

Following Caltech's first demonstration of wireless transmission of solar power in space, the other two experiments on the satellite are delivering promising results. With the space solar power demonstrator coming up for a year since its launch into space, results emerging are fast moving the potential of harnessing solar power in space and ...

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According to Caltech's mission recap released today, engineers behind the Solar Space Power Demonstrator (SSPD-1) consider all three of 110-pound prototype's onboard tools a success and ...

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