



# Space solar power initiative

What is the space-based solar power project (SSPP)?

Through the Space-based Solar Power Project (SSPP), a team of Caltech researchers is working to deploy a constellation of modular spacecraft that collect sunlight, transform it into electricity, then wirelessly transmit that electricity wherever it is needed--including to places that currently have no access to reliable power.

Who financed a space-based solar power project?

The Northrop Grumman Corporation provided funding for initial feasibility studies. Atwater, Hajimiri, and Pellegrino discussed their progress--and the transformational potential of space-based solar power--as the project nears a significant milestone: a test launch of prototypes into space in December 2022.

Could space solar power help humanity transition away from fossil fuels?

Space solar power, renewable energy transmitted 24 hours a day to anywhere on Earth, could help humanity transition away from fossil fuels and live more sustainably.

What is space-based solar power?

The idea of space-based solar power dates back to as early as 1923 when Russian theorist Konstantin Tsiolkovsky proposed using mirrors in space to concentrate a strong beam of sunlight down to Earth.

Will SSPD-1 help chart the future of space solar power?

Now, with SSPD-1's mission in space concluded, engineers on Earth are celebrating the testbed's successes and learning important lessons that will help chart the future of space solar power. "Solar power beamed from space at commercial rates, lighting the globe, is still a future prospect.

How can solar energy be used in space?

Glaser's ambitious plan called for massive satellites equipped with solar-panel arrays capable of harvesting sunlight in space, converting the sunlight into energy, and then beaming that energy wirelessly toward 5-mile-wide receiving antennae on Earth. "It is an incredibly complex piece of infrastructure.

"Uniquely, space-based solar power can provide both baseload and dispatchable power at city scale and as such is a really valuable new clean-energy technology," says Martin Soltau, an analyst ...

Caltech and Northrop Grumman Corporation have signed a \$17.5 million sponsored research agreement for the development of the Space Solar Power Initiative (SSPI). The initiative will develop technologies in three areas: high-efficiency ultralight photovoltaics; ultralight deployable space structures; and phased array and power transmission. "The Space ...

"I used to be a critic of space-based solar power," said Ramez Naam, a climate and clean energy investor. Mr. Naam is now actively seeking space-based solar companies to invest in. "The ...



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8 hours ago; Last month, the UK startup announced a collaboration with the climate initiative Transition Labs to build an orbiting solar power plant in space and beam solar energy down to ...

The space solar power project, announced on Monday (Oct. 21), is a partnership between U.K.-based Space Solar, Reykjavik Energy and Icelandic sustainability initiative Transition Labs.

The space-based solar power plant would produce much more power than an equivalent station on Earth. (Image credit: Space Energy Initiative) "The principal functions of the satellite are ...

If this concept comes to fruition, by sometime in the 2030s Solaris could begin providing always-on space-based solar power. Eventually, it could make up 10 to 15 percent of Europe's energy use ...

Space solar power, renewable energy transmitted 24 hours a day to anywhere on Earth, could help humanity transition away from fossil fuels and live more sustainably. ... of building on our interests and what was happening in each of our areas that might lead to a very impactful research initiative. Over a period of a few months, we came up with ...

This led to the establishment of the UK based Space Energy Initiative created to develop SSP in conjunction with the international community. An impressive list of well known companies, universities, and governments are members of the ... Space Solar Power: Enabling a Green Future with Economic Growth July 2019 c. How Space Technology Benefits ...

However, recent advances in photovoltaics, structures, electronics, and lower launch costs could make space solar power a reality in the near future. May 2013. Donald Bren, chairman of the Irvine Company and life member of the Caltech Board of Trustees, and his wife, Brigitte, who is a Caltech trustee, make a \$100 million investment that helps ...

Space solar power project ends first in-space mission with successes and lessons. Date: January 17, 2024. Source: California Institute of Technology. Summary: A 10-month ...

applications of, in-space SSP and space solar power for terrestrial power; (e) Demonstrate a space solar power pilot plant system in Earth orbit that can deliver power of not less than 100 megawatt-electric (MWe) to one or more terrestrial markets, scalable to a power range of 1 gigawatt-electric (GWe) and higher. To the extent feasible, this

Space-Based Solar Power, SBSP, is based on existing technological principles and known physics, with no new breakthroughs required. Today's telecom satellites transmitting TV signals and communication links from orbit are basically power-beaming satellites - except at a far smaller scale of size and power.

Space agencies and nations think that space-based solar power might contribute to the goal of achieving



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net-zero carbon emissions by 2050. But "we have to prove this is going to actually be a ...

Space Solar Power Initiative Initiate a clean energy technology demonstration of Space Solar Power beamed to Earth from low Earth orbit, deployed within three years. ... oCaltech Space Solar Power Project4has more than \$100Mprivate funding, and with partner Northrup Grumman, is developing SSP technology. On 3 Jan 2023, a prototype device ...

&quot;The Space Solar Power Initiative brings together electrical engineers, applied physicists, and aerospace engineers in the type of profound interdisciplinary collaboration that is seamlessly enhanced at a small place like Caltech. I believe it also demonstrates the value of industry and academic partnerships. We are working on extremely ...

This presentation summarizes the efforts conducted under the Caltech/Northrop Grumman Space Solar Power Initiative (SSPI). SSPI was a three year effort to mature technological concepts associated ...

The design, fabrication, and testing of the initial PV tile prototypes are discussed, which select a 1D, 10-20X parabolic trough concentrator geometry, which provides cooling and radiation shielding for the cells, and which folds flat for deployment. The Space Solar Power Initiative (SSPI) seeks to enable reliable, cost-effective baseload power generation from large ...

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 ...

Space-Based Solar Power . Purpose of the Study . This study evaluates the potential benefits, challenges, and options for NASA to engage with growing global interest in space-based solar power (SBSP). Utilizing SBSP entails in-space collection of solar energy, transmission of that ...

Space Solar Power Initiative (SSPI) To rapidly infuse space technological innovations in collecting solar energy and provide uninterrupted, assured, and logistically agile power to expeditionary forces. Programmatic responsibility given to AFRL to develop a ...

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