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SPACE TECHNOLOGY

Space technology refers to the tools and techniques used for traveling and conducting activities beyond Earth to explore space. Orbital launch vehicles, satellites, spacecraft, deep-space communications, space stations along with other technologies are included in this arena.

SPACE

FOR

ENERGY

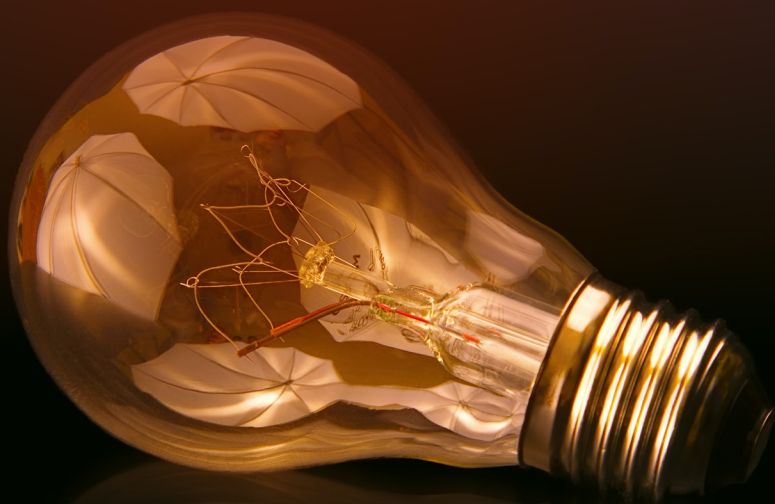
TRANSITION

SATELLITES & GRID TECHNOLOGIES



- Satellites have made it possible to identify suitable locations on Earth for renewable energy infrastructure, such as solar panels and wind turbines. Navigation systems have become more energy-efficient by utilizing satellites in space.
- Telecommunication satellites have made communication more convenient and efficient, reducing the need for travel and ultimately saving a large amount of energy.
- By leveraging space and other innovative technologies, the grid modernization process can be accelerated, as it enables real-time collection and analysis of vast amounts of data from different sources.

SPACE-BASED SOLAR POWER (SBSP)



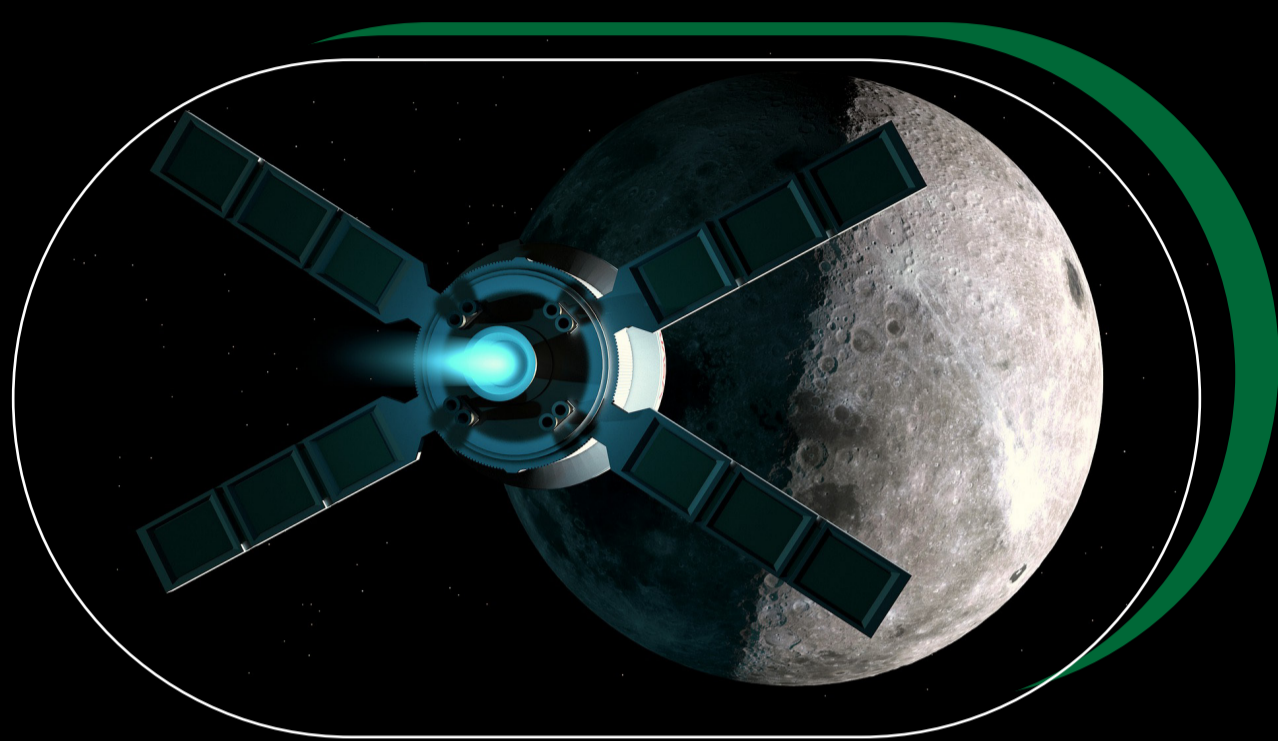
Space-based solar power gathers energy from the sun in space and transmits that energy back to Earth. This technology can help solve many of the problems associated with greenhouse gas emissions and energy production, as SBSP can provide Earth with large amounts of energy with minimal environmental impact. While Earth receives only a fraction of the sun's output, space solar power does not have this limitation. If solar technology is used on a large scale and combined with wireless power transmission, it can potentially supply all the planet's electrical needs.

GREEN ENERGY

FOR

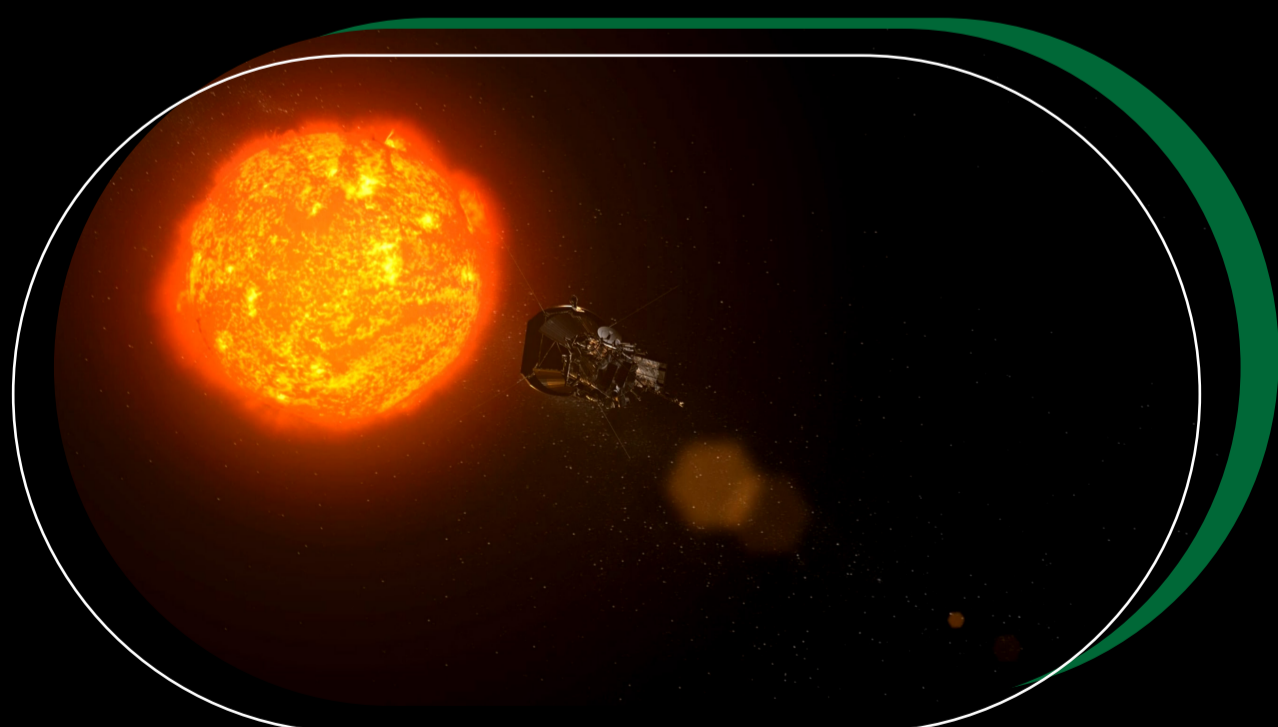
SPACE SUPPORT

RISING TECHNOLOGY



- The first major use of solar cells in space technology was to power satellites during space operations. Vanguard 1 was the first American satellite that used solar panels in 1958. Over the years, solar technology has evolved, and now solar-powered missions have been sent to Venus, Mars, the asteroid belt, and even Jupiter.
- Scientific theories have discovered ways to harness wind energy on Mars. The wind on Mars can power human exploration missions, which can help uncover the planet more effectively.
- A large amount of soot is released into Earth's atmosphere during rocket launches. To solve this problem, a pair of British startups Edinburgh-based Skyrora and Inverness-based Orbex claim that their rocket technology can reduce the environmental footprint by switching to renewable fuel.

SOLAR SPACECRAFT



Satellites are positioned close enough to the sun to harness their energy through solar power. These satellites are equipped with solar panels that absorb the energy and convert it into electricity, which is used to power the spacecraft's batteries. The batteries store enough energy to keep the spacecraft running even when it's not in direct sunlight. NASA's Mars Exploration Rovers, Spirit and Opportunity, as well as Mars Phoenix, have all utilized solar panels for power generation. In cases where spacecraft travel further from the sun, they are fitted with large solar panels to generate sufficient electricity. For instance, NASA's Juno spacecraft is powered by solar energy as it journeys to orbit Jupiter.

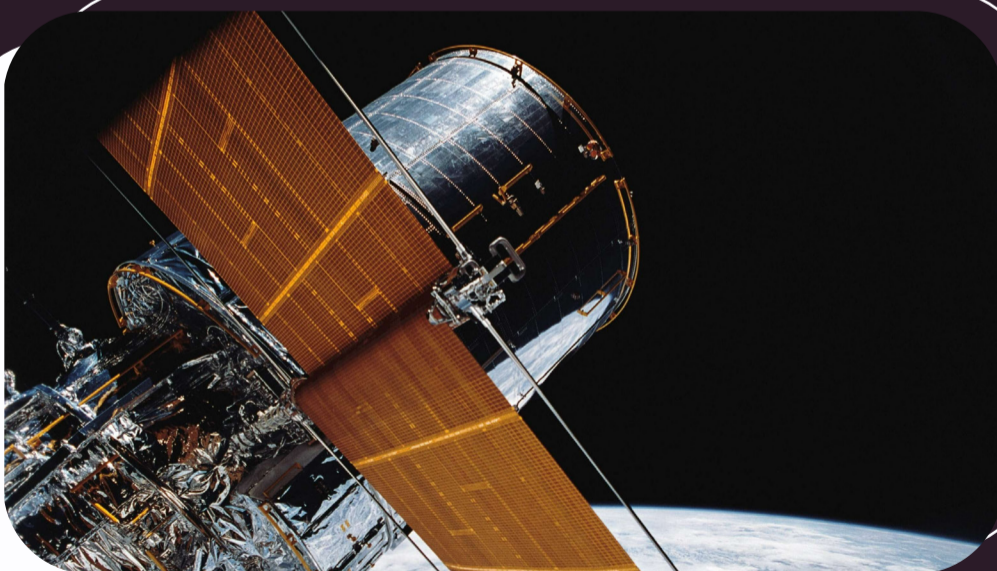
ENERGY INNOVATION & SPACE

SOLAR POWER STATION IN SPACE



There is currently an ongoing consideration by the UK government to construct a solar power station in outer space. This space-based solar power system involves collecting energy from space and transferring it to Earth. The power station will be based on a modular design, with robots assembling multiple solar modules in orbit. According to the Frazer-Nash Consultancy report, the £17 billion space-based solar power development is a feasible concept. The project is expected to begin with small trials, eventually leading to the construction of an operational solar power station by 2040.

THE SANDWICH TILE



Northrop Grumman's Space Solar Power Incremental Demonstrations and Research (SSPIDR) and the Air Force Research Laboratory (AFRL) Project have successfully conducted the first end-to-end demonstration of key hardware for the Arachne flight experiment. During the ground demonstration, the sandwich tile was utilized to convert solar energy into radio frequency (RF), paving the way for a large-scale solar power collection system in space. The sandwich tile consists of two layers: the first layer contains highly efficient photovoltaic (PV) cells that collect solar energy to power the second layer, while the second layer has elements enabling solar-to-RF conversion and beamforming. Currently under development, this project holds the potential to serve as a building block for numerous operational systems.

Space

Exploration

Partners

The NASA logo is displayed in a bold, red, sans-serif font, centered on a white background.

NASA is constantly researching the development of clean energy technologies, focusing on biofuels, solar, and wind. These renewable energy sources will help reduce human dependence on petroleum-based fuels. Even though biofuels provide a means to store and produce energy for NASA's long-term missions, solar energy is currently the primary power source for their missions. New technologies are constantly being developed to improve space-based energy systems.

solestial

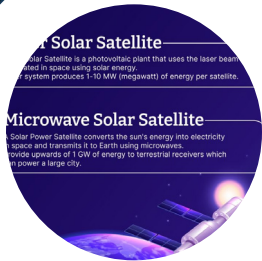
Solestial Inc. is a company that develops silicon solar cell technology for space-based energy-generating applications. The company initially began at Arizona State University under the name Regher Solar. These cells are designed to be extremely lightweight and self-healing at operational temperatures of 80°C and below, even after exposure to radiation.

FINUShots



Combining space technology with renewable energy can change the world

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Space-Based Solar Power (SBSP) has two designs that can transmit energy to Earth

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