

Advanced electric propulsion for space solar power satellites

What is NASA's advanced electric propulsion system?

The advanced electric propulsion system is the next step in NASA's Solar Electric Propulsion (SEP) project, which is developing critical technologies to extend the range and capabilities of ambitious new science and exploration missions.

What is the advanced electric propulsion system?

Testing of Gateway's revolutionary propulsion system, known as the Advanced Electric Propulsion System, begins at NASA's Glenn Research Center. In-space electric propulsion systems, such as SEP, tout extremely high fuel economy at lower thrust, providing mission flexibility and capabilities not achievable using traditional propulsion systems.

How have electrical propulsion systems revolutionized satellite technology?

Electrical propulsion systems have revolutionized satellite technology by offering greater efficiency, longer mission durations, and increased maneuverability compared to traditional chemical propulsion systems. This review explores current technologies and future prospects in the field of electrical propulsion systems for satellites.

How can advanced propulsion systems improve satellite missions?

Integration of propulsion systems with advanced attitude control and navigation systems will enable precise orbit control and station-keeping, enhancing the capabilities of future satellite missions.

What is the solar electric propulsion project?

The SEP project is a part of the Technology Demonstration Missions program within NASA's Space Technology Mission Directorate. NASA Glenn leads the Solar Electric Propulsion project for the agency. Meet Dr. Peter Peterson, an electric propulsion engineer at NASA's Glenn Research Center.

Does NASA need electric propulsion?

But as NASA prepares to use electric propulsion for more ambitious science and technology missions, and on human missions for the first time, the agency needs to increase the power available. Testing of Gateway's revolutionary propulsion system, known as the Advanced Electric Propulsion System, begins at NASA's Glenn Research Center.

The space agency has awarded California-based company Aerojet Rocketdyne a \$67 million, 36-month contract to design, build and test an advanced, superefficient solar electric propulsion (SEP ...

In-space electric propulsion (EP) is any in-space propulsion technology wherein a propellant is accelerated through the conversion of electrical energy into kinetic energy. The electrical energy source powering in ...

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Miniaturized spacecraft built from advanced nanomaterials are poised for unmanned space exploration. In this review, the authors examine the integration of nanotechnology in electric propulsion ...

Space Transfer-Vehicle Concept for Deploying Solar-Power Satellites 1 Apr 2001 | Journal of Aerospace Engineering, Vol. 14, No. 2 Mission advantages of constant power, ...

NASA has selected Aerojet Rocketdyne, Inc. of Redmond, Washington, to design and develop an advanced electric propulsion system that will significantly advance the nation's ...

Advanced propulsion for space solar power satellites. Steve Oleson; Steve Oleson. Dynacs Engineering Co., Inc., Brook Park, OH ... Overview of the Development of the Solar Electric Propulsion Technology Demonstration Mission 12.5-kW Hall Thruster ... Space Transfer-Vehicle Concept for Deploying Solar-Power Satellites. 1 Apr 2001 | Journal of ...

An Advanced Electric Propulsion System undergoing tests at NASA's Glenn Research Center. (Image credit: NASA/Jef Janis) The energy for the electromagnetic fields is often provided by solar arrays ...

Electric propulsion. It was around the turn of the century that electric propulsion technologies started looking more attractive; the lifetime of electronics was increasing and spacecraft were able to generate more ...

More power for people! The Power and Propulsion Element (PPE) for Gateway will demonstrate advanced, high-power solar electric propulsion around the Moon. It is a 60kW-class spacecraft, 50 of which can be dedicated ...

There are still several challenges in the further development of the existing advanced propulsion systems. Firstly, an increase in specific impulse is needed to enable all the potential applications of electric and plasma propulsion systems, ranging from small satellites to large, manned spacecraft directed toward the Moon and Mars.

NASA has sought to utilize high-power solar electric propulsion as means of improving the affordability of in-space transportation for almost 50 years. Early efforts focused ...

Advanced Electric Propulsion System (AEPS) for NASA exploration missions through a contract with Aerojet Rocketdyne (AR). An objective of the AEPS project is ...

Solar electric propulsion allows deep-space missions to carry more cargo and use smaller launch vehicles while reducing mission costs. The Solar Electric Propulsion project has developed solar arrays that are lighter, ...

Advances in solar array and electric thruster technologies now offer the promise of new, very capable space

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transportation systems that will allow us to cost effectively explore the solar system. NASA has developed numerous solar electric propulsion spacecraft concepts with power levels ranging from tens to

This technical feat was accomplished by the miniaturization of many advanced high-power solar electric propulsion technologies developed over the last decade for applications such as the Power and Propulsion Element of ...

Testing of Gateway's revolutionary propulsion system, known as the Advanced Electric Propulsion System, begins at NASA's Glenn Research Center. In-space electric propulsion systems, such as SEP, tout extremely high fuel ...

The sun tower concept of collecting solar energy in space and beaming it down for commercial use will require very affordable in-space as well as earth-to-orbit transportation. Advanced electric propulsion using a 200 kW power and propulsion system added to the sun tower nodes can provide a factor of two reduction in the required number of launch vehicles when compared to ...

advanced in-space propulsion are usually discussed when looking at efficient in-space transportation. Electric Propulsion (EP) refers to any form of in-space propulsion technology which uses electricity to enhance the specific impulse of the thruster. Solar Electric Propulsion (SEP) simply refers to any electric propulsion system which derives ...

active satellites are in orbit as of October 2020, with an increase of ~1000 smallsats in the past two years. Since 2012, over 1700 smallsats have been launched into orbit. It is projected that by 2025, there will be 1000 ...

The agency's primary EP efforts have centered on large exploration and science missions, like the 7-kilowatt (kW) NEXT-C gridded-ion system currently flying on the Double Asteroid Redirection Test mission and ...

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