Solar Electric Propulsion System

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.

What is NASA's solar electric propulsion (SEP) project?

NASA's Solar Electric Propulsion (SEP) project is developing critical technologies to enable government and commercial customers to extend the length and capabilities of ambitious new exploration and science missions.

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.

Does NASA have a solar electric propulsion mission?

Since 2012 the NASA Space Technology Mission Directorate has had a coordinated plan to mature the requisite solar array and electric propulsion technology needed to implement a 30 to 50 kilowatt solar electric propulsion technology demonstration mission.

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.

What is the current state-of-art for electric propulsion?

The current state-of-art for electric propulsion is 5-kilowatt systemscapable of processing 100's of kilograms of xenon propellant. In 2010 NASA Space Technology Mission Directorate (STMD) began addressing these technology shortfalls with technology maturation efforts in each of these two areas. These efforts are described below. A. Solar Arrays

Mars mission, solar electric propulsion is a valuable option for robotic probes to explore the solar system. Solar electric propulsion has been analyzed for a number of missions [9, 10], including Mercury missions, asteroid sample return, return of samples from the Martian moons Deimos and

Neglecting component lifetime considerations, an arbitrarily large amount of energy can be delivered (from a solar or nuclear power system) to a given mass of propellant so that the exhaust velocity (or specific impulse)

can be much larger than that available from a chemical propulsion system. Electric propulsion systems are termed "power ...

The development of a new transportation architecture is critical to sustain the future of space exploration in our Solar System. Laser electric propulsion powered by a remote Directed Energy Launch Technology Array, DELTA-LEP, is uniquely promising for ultra-rapid Solar System transit. The proposed architecture is flexible, from pico- and ...

High-Power Solar Electric Propulsion for Future NASA Missions David Manzella1 and Kurt Hack2 NASA Glenn Research Center, Cleveland, Ohio, 44135 ... systems that could be used with the Space Shuttle, while later efforts focused on systems nearly an order of magnitude higher power that could be used with heavy lift launch vehicles. These efforts

Electric propulsion (EP) [2], [3] is a more efficient and environmentally friendly alternative to chemical rockets. EP systems use electrically charged particles, such as ions or electrons, to generate thrust. For a given value of the available power, they produce lower levels of thrust (~ 5 ? 1 0 - 1 to 10 -3 N) than chemical engines, but with much higher specific ...

Electric Propulsion System and its broader Ion Propulsion Subsystem mission application. Available from Level of Review: This material has been technically reviewed by technical management. ... solar electric propulsion that is being matured and delivered through the AEPS contract (Ref. 5).

It concludes that the solar electric propulsion systems best suited for Discovery missions have a solid system flight heritage that can meet the requirements for deep space with minimal modifications. Commercially developed electric propulsion systems offer significant heritage potential and, in many cases, the required changes for deep-space ...

NASA is continuing to develop and qualify a state of the art 13 kW-class Advanced Electric Propulsion System (AEPS) for NASA exploration missions through a contract with Aerojet Rocketdyne (AR). An objective of the AEPS project is accelerate the adoption of high power electric propulsion technologies by reducing the risk and uncertainty of integrating Solar ...

An electric propulsion system uses energy collected by either solar arrays (solar electric propulsion) or a nuclear reactor (nuclear electric propulsion) to generate thrust, eliminating many of the needs and limitations of storing ...

About one-half of Everything Launched is In-Space Propulsion It is a Major Opportunity for Mission Affordability Improvement Why Consider Solar Electric Propulsion? Some Factors Influencing Spacecraft Mass Allocations: Mission: DV, duration, environments Technology changes: launcher size/capability, payload mass/volume, power system

Navalt offers advanced electric propulsion systems for boats, providing eco-friendly and efficient solutions for smoother sailing and sustainable boating. Skip to content. About us; Our Vessels. ... Navalt Solar & Electric Boats Pvt. Ltd Kerala Technology Innovation Zone Kalamassery, Kochi - 683503, India. Phone: +91 9895 329 271, +91 9895 ...

A SEP propulsion system is therefore limited to relatively small thrusts ... The PPE [11abc] is a high-power, 60-kilowatt solar electric propulsion spacecraft that will provide power, high-rate communications, attitude control, and orbital transfer capabilities for the Gateway. The PPE will allow access to the entire lunar surface and act as a ...

Once the stuff of science fiction, the efficient and quiet power of electric propulsion will provide the force that propels the Psyche spacecraft all the way to the main asteroid belt between Mars and Jupiter. The orbiter"s target: a metal ...

Testing of Gateway"s revolutionary propulsion system, known as the Advanced Electric Propulsion System, begins at NASA"s Glenn Research Center. ... NASA"s high-power solar electric propulsion development work is managed by NASA Glenn under the direction of the agency"s Space Technology Mission Directorate.

space 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 hundreds of kilowatts for robotic and piloted missions to asteroids and Mars. This paper describes nine electric and hybrid solar electric ...

Solar electric propulsion systems have been studied since the early 1900s by space visionaries such as Tsiolkovsky, Goddard, and Oberth, but have yet to realize their full potential as foreseen by these influential figures. 1. next Technological advancement of ...

Solar Electric Propulsion (SEP) is commonly used to transfer satellites to their proper orbital locations and keep them on station once there. Energized by the electric power from on-board solar arrays, SEP systems use ...

The four T6 thrusters around which the solar electric propulsion system is designed, have a heritage dating back decades. QinetiQ in the UK - formerly the UK Defence Evaluation and Research Agency and before that the ...

Vehicle, it electric propulsion system, which is based on Northrop Grumman" flight proven GEOStar-3 system, and its concept of operations for satellite servicing. ... carried during a single launch, solar electric propulsion has become a key element in the deployment of large satellite constellations into low earth orbit.

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 the electric power from solar cells. In contrast, Nuclear Electric Propulsion (NEP) would provide the ...

SEP HERMeS TDU Evolution to Advanced Electric Propulsion System (AEPS) o13-kW class Hall thruster ion propulsion string developed for 50-kW SEP vehicles. -Power: 12.5 kW -3X SOTA discharge power-Propellant Throughput: 1,700 kg -7X SOTA propellant throughput-Maximum Isp: 2,600 s-1.5X SOTA discharge voltageoUtilizes magnetic-shielding previously ...

Live-Life cycle assessment of the electric propulsion ship using solar PV. Author links open overlay panel Chybyung Park a, Byongug Jeong a, Peilin Zhou a b, Hayoung Jang a, Seongwan Kim c, Hyeonmin Jeon d, Dong Nam e, Ahmad Rashedi f g. ... The electric propulsion system, on the other hand, is a system in which electric energy is obtained by ...