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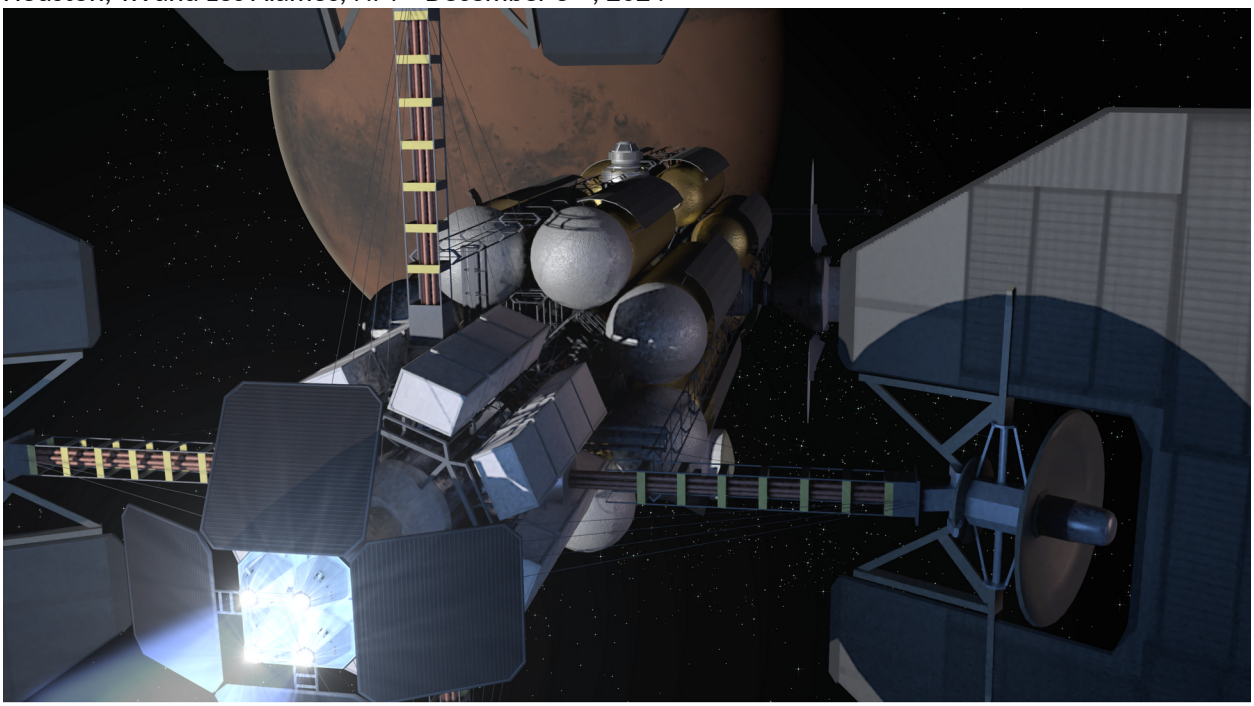
Ad Astra Rocket Company and The Space Nuclear Power Corporation Forge Strategic Alliance to Pioneer High-Power Nuclear Electric Propulsion

Houston, TX and Los Alamos, NM – December 3rd , 2024



Rendering of a 40 MW VASIMR® Nuclear Electric Propulsion (NEP) human mission to Mars (Credit, Ad Astra Rocket Company)

Ad Astra Rocket Company (Ad Astra) and The Space Nuclear Power Corporation (SpaceNukes) have signed a strategic partnership to advance high-power Nuclear Electric Propulsion (NEP) technology to enable fast and reliable human and robotic missions to Mars and beyond. This alliance builds on Ad Astra's 20-year experience with the Variable Specific Impulse Magnetoplasma Rocket (VASIMR®) and SpaceNukes' Kilopower reactor technology, developed over the last decade under the joint NASA/NNSA/LANL "KRUSTY" ground test program and the current Space Force JETSON program.

- Ad Astra's VX-200SS™ high-power VASIMR® Prototype
- SpaceNukes' ground-tested Kilopower Space Reactor

Technologies: Traditional electric propulsion technologies use electrostatic acceleration and operate at relatively low power levels (1-50 kW). In contrast, VASIMR®'s electromagnetic architecture scales more favorably to higher power levels (100s of kW to multi-MW), its electrodeless design leads to long operating life, and its fundamental physics make it "propellant-agnostic," able to use a variety of abundant and inexpensive propellants. Kilopower's high-temperature capability, launch safety characteristics, and simple adaptability to high powers make it an ideal nuclear reactor to pair with electric propulsion. The integrated nuclear power and propulsion system brings performance benefits, including commonality in high-temperature heat rejection and direct coupling of the reactor power to the VASIMR®'s RF system.

Partnership: The Memorandum of Understanding (MOU) between Ad Astra and SpaceNukes outlines a shared vision and passion for developing and demonstrating NEP technology and establishes a framework by which both companies will jointly pursue technical and business development. The VASIMR® and Kilopower have been pioneered over many years and are now ready for a flight program. The partnership aims to demonstrate high-power NEP in a flight program by the end of the decade and commercialize the technology in the 2030s.

> "*Nuclear Electric Propulsion will achieve game-changing performance via stepwise technology evolution. Our plan will begin with a 100 kW plus NEP system as a steppingstone to a less than 5 kg per kW multi-megawatt NEP system with the capability to reduce the round-trip human transit time to Mars from more than a year to a few months,*" said Dr. David Poston, CTO of SpaceNukes.
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> Ad Astra's CEO, Dr. Franklin Chang Díaz, added: *"In 1958, sailing from the north Pacific, the USS Nautilus dove just north of Utqiagvik, Alaska, and surfaced, 96 hours later northeast of Greenland. The voyage under the North Pole, hitherto impossible by a conventional submarine, was enabled by nuclear power. High-power NEP will enable 'The Nautilus Paradigm' to extend into space, opening the entire solar system to human exploration. We are proud, through this alliance, to help lay the groundwork for this achievement."*

A New Era in Space Travel: High-power NEP offers numerous advantages over traditional propulsion methods. Electric propulsion systems are significantly more efficient, using 10-100 times less propellant than chemical rockets. With a high specific-power nuclear reactor, NEP systems can provide the necessary power for rapid transportation around the solar system. NEP enables human-timescale missions to Mars, Jupiter, and beyond without propellant depots, bases, or sunlight.

About Ad Astra Rocket Company

Ad Astra Rocket Company is the developer of the VASIMR® engine, an advanced plasma space propulsion system aimed at the emerging in-space transportation market. Ad Astra also owns and operates supporting research and development subsidiaries in the US and Costa Rica. Through its subsidiaries, the company also develops earthbound high technology applications in renewable energy, green hydrogen, advanced manufacturing, and applied physics. Ad Astra has its main laboratory and corporate headquarters at 141 W. Bay Area Boulevard in Webster, Texas, USA, about four miles from the NASA Johnson Space Center.

About The Space Nuclear Power Corporation

The Space Nuclear Power Corporation is the world leader in space nuclear technology. The SpaceNukes team designed, built, and ground-tested the 1 kW Kilopower reactor for NASA in 2018. They are working with the Space Force on a 12 kW Kilopower design and are working toward a flight demonstration. In parallel with JETSON, the SpaceNukes are working to commercialize nuclear energy for power, heat, and electric propulsion to serve the needs of the new space economy.

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