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# Google Announced 'Project Suncatcher' to Develop Space-Based AI Infrastructure

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In November 2025, Google LLC announced 'Project Suncatcher,' a research moonshot initiative to develop a **space-based, solar-powered Artificial Intelligence (AI) infrastructure system** using **Tensor Processing Units (TPUs)** aboard satellites to explore the scalability and feasibility of machine learning (ML) compute systems in low-Earth orbit (LEO).

## About Project Suncatcher:

**Project Overview:** It aims to build a solar-powered, space-based AI infrastructure using Trillium TPUs proven to withstand up to 15 krad(Si) radiation, operating in a dawn–dusk orbit with advanced thermal radiators to manage heat in space.

**Launch & Partnership:** Two prototype satellites, developed with Planet Labs, will launch in early 2027 to test AI performance and optical communication systems.

**Solar-powered satellites in low Earth orbit (LEO):** The idea is to place satellites in a dawn–dusk sun-synchronous orbit where solar panels can generate up to  $8 \times$  the power compared to ground installations, offering near continuous energy exposure.

**Communication Test:** Bench-scale validation achieved 800 Gigabits per second (Gbps) each way (1.6 Terabits per second, (Tbps) total) using Dense Wavelength Division Multiplexing (DWDM)-based free-space optical links, crucial for high-speed inter-satellite communication.

**Constellation & Hardware:** An 81-satellite constellation (within 1 kilometer, km) will form a distributed AI network, connected by Free-Space Optical (FSO) links achieving up to tens of Tbps using DWDM technology.

**Economic Outlook:** Falling launch costs below USD 200/kilogram (kg) by the mid-2030s could make space-based data centers cost-competitive with Earth-based ones, supporting scalable and sustainable AI growth.

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