

Project Suncatcher

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Why in News?

Google Chief Executive Officer Sundar Pichai has unveiled Project Suncatcher, recently.

- **Aim** - To build a scalable compute network in orbit that could one day supplement or replace some terrestrial data-centres, especially for AI workloads.
- **Initiative by** - Google LLC.
- **Objective** - To process AI workloads in space, reducing the environmental footprint of terrestrial data centres while benefiting from uninterrupted solar exposure.
- **Computer Hardware** - The project envisions constellations of satellites equipped with Google's custom ***Tensor Processing Units (TPUs)*** for machine-learning workloads.
- These satellites will be solar-powered, leveraging near-constant sunlight in certain orbits to generate large amounts of electricity.
- As part of the project, Google plans to deploy specialized AI chips on solar-powered satellites in low-Earth orbit.
- **Orbit & Energy** - The satellites would use an orbit such as a dawn-dusk sun-synchronous low-Earth orbit (LEO) to maximize sunlight exposure, enabling solar panels to be "up to 8 times more productive than on Earth".
- **Networking** - The idea includes linking satellites via free-space optical inter-satellite links (optical communication, lasers) at tens of terabits per second, so that the constellation forms a high-performance compute cluster in orbit.
- **Prototype mission** - Google plans to launch two prototype satellites (in partnership with Planet Labs PBC) by early 2027 to test key systems (hardware in space, power, comms).
- **Cluster size concept** - One scenario described is an array of ~81

satellites within ~1 km radius orbiting as a cluster, forming a compute fabric.

- **Potential advantages**

- **Energy productivity** - In space, solar panels can operate with less interruption (no night/day cycle in certain orbits, less atmospheric attenuation) so more usable power for compute.
- **Scalability & density** - It may avoid Earth-based constraints (land, cooling, local power infrastructure) when building enormous AI compute farms.
- **Reduced terrestrial constraints** - Data centres on Earth have to deal with power, cooling, environmental impact, local regulation.

Reference

[Business Standard | Project Suncatcher](#)

