

Even the Sky May Not Be the Limit for A.I. Data Centers

By Eli Tan and Ryan Mac Jan. 1, 2026 NYT

If the architects of the artificial intelligence boom are right, it is only a matter of time before data centers — the giant computing facilities that power A.I. — will float in orbit and be visible in the night sky like planets.

The science-fiction-like dream is being driven by A.I. and space industry leaders who are growing increasingly worried that data centers will eventually require more energy and land than are available on Earth. So one solution — perhaps the only solution, they say — is to start building them in space.

Google announced in November that it was working on Project Suncatcher, a space data center project that would begin test launches in 2027. Elon Musk said at a recent conference that space data centers would be the cheapest way to train A.I. “not more than five years from now.” Others pledging support for the idea include Jeff Bezos, the founder of Amazon and Blue Origin; Sam Altman, the chief executive of OpenAI; and Jensen Huang, the chief executive of Nvidia. “It is not a debate — it is going to happen,” said Philip Johnston, the chief executive of Starcloud, a space data center start-up. “The question is when.”

The notion has gained traction as the A.I. race hits a fever pitch, fueling fears of a potential bubble. Meta, OpenAI, Microsoft, Amazon and other big tech companies are investing hundreds of billions in data centers worldwide, with OpenAI alone committing \$1.4 trillion to such projects. Saudi Arabia and other nations are also pouring money into these efforts, while smaller companies pile up debt and take on financial risks to join the frenzy.

Yet earthbound data centers are increasingly running into limits. In many places, the projects lack enough available power for the computing needs. Local opposition has also flared over whether data centers are driving up utility bills and exacerbating water shortages.

That has led to more creative — some might say wishful — thinking with space data centers. Technologists and scientists have researched the idea and concluded that some version of these projects may be possible in the next few decades. But skeptics said the proposals flew in the face of physics and would be astronomically expensive.

Tech luminaries like Mr. Musk have also recently made comments about space data centers that are a magnitude larger than what current research suggests is possible, said Pierre Lionnet, a space economist and director at Eurospace, a trade association. “It’s completely nonsensical,” he said.

The National Aeronautics and Space Administration introduced the idea of space data centers in the 1960s. In the 1980s, the concept of “data repositories” in space popped up in science fiction stories. In the last decade, the notion of space data centers that could power modern A.I. also emerged.

The main benefit to building a data center in space is abundant energy, with nearly 24/7 access to the sun and no clouds to obstruct the project’s solar panels, Mr. Johnston said. There are also fewer environmental regulations than on Earth, not to mention fewer neighbors to oppose the imposition or complain about electric bills.

But the feasibility hinges on whether it will become cheaper to launch materials into space and whether technical issues like radiation and cooling can be solved in the meantime. Experts are split on how soon those conditions can be met. “As a business case, it’s plausible,” said Phil Metzger, a physics professor at the University of Central Florida and a former physicist at NASA. “It’s been an evolving discussion.”

Data centers in space would look different from the football-stadium-size facilities on Earth. Most mock-ups from companies like Starcloud look like large satellites with a cluster of servers housing A.I. chips at the center of miles of solar panels to power them.

The data centers would need to be rebuilt every five years, which is when the computer chips are typically replaced, Mr. Johnston of Starcloud said. They would be visible at dawn and dusk from Earth, he said, appearing in the sky as about a quarter the width of the moon.

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