



BUZZ HPC



first
principles

Case Study: Powering the AI Physicist

How First Principles built a scalable, reliable compute foundation for autonomous scientific research.

Overview

First Principles is a non-profit research organization building AI infrastructure for scientific discovery. Its flagship initiative, Theo, the AI Physicist, is a modular, domain-specialized system designed to support research in fundamental physics. As the organization's technical ambitions grew, First Principles needed infrastructure that could provide dependable access to high-performance compute, scale with demand, and remain cost-effective for a fast-moving research team.

Challenges

First Principles is pursuing an ambitious long-term moonshot of building an AI Physicist capable of developing new fundamental theories of physics that advance our understanding of how the universe works. Theo is being developed as a modular system that can eventually formulate its own questions, generate hypotheses, validate them through simulation and data, and continuously improve over time.

To support that vision, the organization needed infrastructure capable of handling increasingly demanding AI workloads. But as development accelerated, two major constraints became more pressing.

The first was cost. Pay-as-you-go cloud environments offered flexibility, but at the level of performance First Principles required, costs would have become difficult to sustain. Just as important, those environments did not provide the control and predictability of dedicated infrastructure.

The second was availability. Accessing high-powered systems through public cloud providers can be inconsistent, especially when demand is high for advanced GPU platforms. For a research organization moving quickly, delays in access can create friction at exactly the wrong moment.

WHY BUZZ HPC?



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BUZZ HPC Client

“For a fast-moving research organization, reliable access matters enormously. BUZZ HPC has given us the consistency we need to keep momentum.”

Results & Impact

Since adopting BUZZ HPC's infrastructure, First Principles has seen the greatest impact in reliability and availability. The team can access the compute it needs on a dependable basis, which is especially valuable in a fast-paced research environment where momentum matters.

The pricing model has also been an important advantage. As a non-profit, First Principles must balance ambition with responsible resource allocation. Dedicated infrastructure at a competitive price has helped the organization scale its technical capabilities without introducing the volatility often associated with high-end public cloud usage.

Support has been another differentiator. According to the team, BUZZ HPC's operational and technical support has been prompt and effective throughout the engagement, helping reduce friction and allowing researchers to stay focused on development rather than infrastructure constraints.

Taken together, these benefits have given First Principles a stronger foundation for building Theo and advancing its broader mission of developing AI systems that can reshape how scientific inquiry is conducted.

Looking Ahead

As First Principles continues to build Theo, infrastructure agility will remain essential. The team is preparing for migration to Blackwell-based B200 systems, future Rubin-class platforms, and expanded node capacity to support increasingly ambitious AI research workloads. For a fast-growing organization, the ability to scale quickly is not just an advantage, it is a requirement.

Client Feedback

"We're able to access what we need when needed reliably, which is valuable to an organization that moves fairly quickly. On top of this, your price is competitive, and as a non-profit this is also important. Overall your support has been prompt and effective, perhaps more so than other platforms to date."



BUZZ HPC

Ready to scale your AI infrastructure?

Learn how BUZZ HPC supports high-performance workloads with dedicated infrastructure built for reliability, speed, and growth.

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