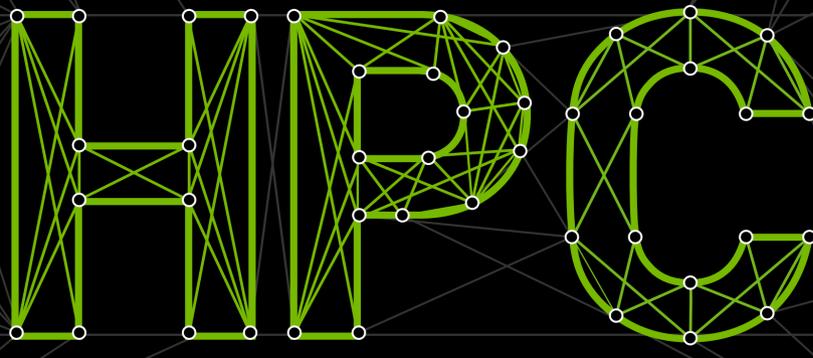


AI IS TRANSFORMING



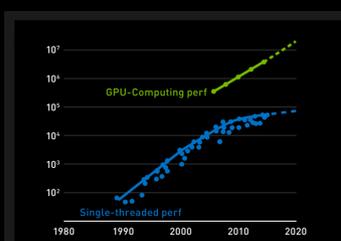
A New Era of Discovery

HPC is a fundamental pillar of modern science. From predicting weather to discovering drugs to finding new energy sources, researchers use large computing systems to simulate and predict our world.

AI extends traditional HPC by letting researchers analyze massive amounts of data faster and more effectively. It's a transformational new tool for gaining insights where simulation alone cannot fully predict the real world.

Historic Changes in HPC

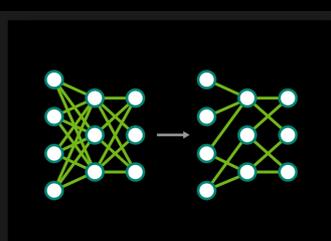
The increasing need to find useful insight in tremendous amounts of data is creating new challenges—and new opportunities in solving the world's greatest challenges.



End of Dennard Scaling

Dennard Scaling has reached its limit, capping single-threaded performance.

Moving forward, increasing application performance will require fine-grain parallel code with tremendous computation that only GPUs can deliver.



AI and Data Science

AI and data science are emerging as important new components of scientific discovery.

Dramatic improvements in accuracy and response time with deep learning are providing unprecedented insight from huge volumes of data



A New Usage Model

Researchers are turning to in-situ execution and visualization to enhance their processes and productivity.

This new capability is being driven by tight coupling of interactive simulation, visualization, and AI data analytics.

Powering the Exascale Era

1+ EB

The SKA1 Square Kilometre Array radio telescope will generate more than an Exabyte of data every day.

10X

The CERN Large Hadron Collider's High Luminosity upgrade will result in a 10X increase in data volume.

30X

The 500 MW ITER fusion experiment will provide a 30X increase in output power over the largest previous experiment.

200 PB

The Large Synoptic Space Telescope will deliver 15 TB of data per night to address questions about the evolution of the universe.

Potential Exascale Advancements

HPC

- > Tap into +40 years of algorithms based on first principles theory.
- > Take advantage of proven statistical models for accurate results in multiple science domains.

AI

- > Employ new methods to improve predictive accuracy, insight into new phenomena, and faster response time.
- > Gain new knowledge from previously unmanageable data sets.



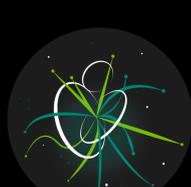
Commercially viable fusion energy



Understanding cosmological dark energy and matter



Clinically viable precision medicine



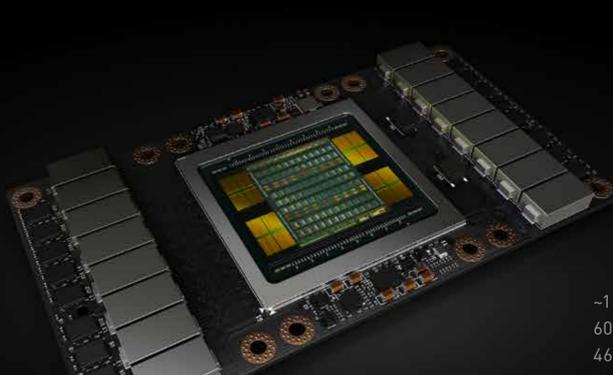
Improvement and validation of the Standard Model of Physics



Climate/weather forecasts with ultra-high fidelity

A Unified AI Supercomputing Architecture

By pairing NVIDIA® CUDA® cores with Tensor cores, NVIDIA Volta gives you the ideal architecture for building your next high-performance, AI-enabled supercomputer.



~1 Petaflop of AI performance in a server
60 TFLOPS of FP 64 in a server
460+ HPC applications accelerated
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Find out more about how AI solutions like the NVIDIA Tesla V100 are transforming HPC.

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