

EMBARGOED TILL 25 OCTOBER 2024 (FRIDAY), 4.00PM SGT

New S\$270 Million Grant to Boost National Supercomputing Infrastructure, HPC Capabilities and Talent Development

- *Deputy Prime Minister and Chairman of the National Research Foundation Mr Heng Swee Keat announced a S\$270 million grant to build Singapore's next supercomputer and develop high performance computing (HPC) capabilities to support national research initiatives.*
- *The announcement was made at the official launch of the ASPIRE¹ 2A and 2A+ systems, which are research supercomputers managed by the National Supercomputing Centre (NSCC) Singapore.*
- *Supercomputers are a critical resource in areas of research such as AI, climate science, quantum computing, biomedicine, advanced manufacturing, materials science, genomics and the built environment.*

Singapore, 25 October 2024 – Singapore will commit S\$270 million to develop its national supercomputing infrastructure and strengthen the National Supercomputing Centre (NSCC) Singapore's capabilities to support local research. The announcement was made by Mr Heng Swee Keat, Deputy Prime Minister and Chairman of the National Research Foundation (NRF) at the official launch of the ASPIRE 2A and 2A+ systems, which are research supercomputers managed by NSCC.

The grant, provided by NRF, will fund the development of NSCC's next-generation supercomputer to meet the growing demand for high-performance computing (HPC) resources and unlock new research opportunities. The next supercomputer to follow 2A+, is expected to be operational in the latter half of 2025 and will also explore greater synergies and integration between classical supercomputers and quantum computers. This combination will be crucial in solving the ever-growing complexity and data-intensiveness of future research challenges.

In addition to infrastructure development, the grant will support talent and skills development within Singapore's HPC ecosystem. NSCC will expand its initiatives to equip local researchers and scientists with enhanced capabilities, focusing on developing advanced algorithms, optimising large-scale HPC and AI projects, and improving research efficiency. These efforts will enable faster, more impactful breakthroughs across various fields. In collaboration with local universities, research institutes, and HPC companies, NSCC will mentor and train talent to create new HPC tools, applications, and software. An upcoming initiative, the Young Investigator Seed Programme, specifically nurtures early-career researchers by providing access to HPC resources. Resources will also be set aside for SMEs and start-ups to accelerate their research into business applications and innovations, helping them sharpen their competitive edge in the market.

Additionally, the grant will promote partnerships with international supercomputing centres, including those in Japan and Finland. This will allow Singapore to tap global expertise, knowledge, and strategies in shared areas of interest, further enhancing local HPC capabilities and driving skills development.

"At NSCC, our value proposition goes beyond the bare metal hardware and technology we provide. In addition to our supercomputers, we are focusing on three key areas: expanding our HPC capacity and diversity, strengthening organisational and operational excellence, and cultivating talent and empowering our users to achieve greater breakthroughs," said Dr Terence Hung, Chief Executive, National Supercomputing Centre (NSCC) Singapore.

¹ *Advanced Supercomputer for Petascale Innovation, Research and Enterprise (ASPIRE)*

Official launch of ASPIRE 2A and ASPIRE 2A+

The launch of ASPIRE 2A and ASPIRE 2A+, Singapore's high-performance research supercomputers, marks a significant milestone in strengthening the country's strategic supercomputing infrastructure. Managed by NSCC, these systems are designed to accelerate advancements in key areas such as climate and weather research, materials and chemical sciences, genetics and healthcare, advanced modelling and simulation, and big data analytics. The new resources of ASPIRE 2A+ will also greatly benefit fields like large language models, generative AI, quantum simulations, as well as advanced materials research, biomedical, and health sciences, as part of the AI for Science initiative. Detailed specifications of ASPIRE 2A and 2A+ can be found in Annex A.

ASPIRE 2A and ASPIRE 2A+ are already delivering impactful results. A notable example is the Third National Climate Change Study (V3), conducted by the National Environment Agency's Centre for Climate Research Singapore (CCRS). NSCC's supercomputers were instrumental in producing Southeast Asia's highest-resolution climate projections by downscaling global climate models from 100 km to 2 km over Singapore. This simulation, which analysed over 3,000 years' worth of climate data into just four years, provides policymakers and businesses with vital insights to plan for extreme weather, heat stress, and rising sea levels, helping safeguard Singapore's infrastructure and economy.

"Access to large-scale supercomputing resources is essential for modern-day weather and climate science. For example, regional climate projections, such as Singapore's 3rd National Climate Study launched in January 2024, rely on supercomputers to perform millions of calculations per second using sophisticated climate models. These provide detailed insights into the local impacts of climate change in the coming decades. The rise of AI-based weather prediction and 'hybrid' physical and AI climate models represents a potential step change in Singapore's capabilities to prepare for extreme weather and the broader impacts of climate change. The next generation of NSCC's supercomputers will help drive these advancements," said Prof Dale Barker, Director, Centre for Climate Research Singapore, National Environment Agency.

The launch of ASPIRE 2A and ASPIRE 2A+ reinforces Singapore's commitment to building a robust supercomputing infrastructure that supports research and improves lives. With these new systems, Singapore is well-positioned to stay competitive and meet the challenges of an increasingly complex and rapidly evolving technological landscape.

Enclosed:

Annex A – About ASPIRE 2A and ASPIRE 2A+

For media queries and clarifications, please contact:

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About the National Supercomputing Centre (NSCC) Singapore

NSCC Singapore was established in 2015 to manage Singapore's national petascale facilities and high-performance computing (HPC) resources. A National Research Infrastructure funded by the National Research Foundation (NRF), and hosted by A*STAR, the HPC resources that we provide help support the research needs of the public and private sectors, including research institutes, institutes of higher learning, government agencies and companies.

As a national strategic technological platform, NSCC has the mission to enhance competence, capacity and competitive advantage in the use of HPC in all relevant fields such as computational science, analytics, engineering, advanced manufacturing, genomics, biomedicine, healthcare, AI and quantum computing, among many others. With the support of our research partners, NSCC catalyses national research and development initiatives, develops HPC skillsets and applications, and enhances Singapore's research capabilities. For more information, please visit: <https://www.nscg.sg/>

About the National Research Foundation (NRF)

The National Research Foundation, Singapore (NRF), set up on 1 January 2006, is a department within the Prime Minister's Office. The NRF sets the national direction for research and development (R&D) by developing policies, plans and strategies for research, innovation and enterprise. It also funds strategic initiatives and builds up R&D capabilities by nurturing research talent. For more information, please visit: <https://www.nrf.gov.sg/>

About ASPIRE 2A and ASPIRE 2A+



Advanced Supercomputer for Petascale Innovation Research & Enterprise (ASPIRE) 2A

ASPIRE 2A is a warm water-cooled system and provides an aggregate of up to 10 PFLOPS of raw compute power. It serves as the current HPC workhorse for Singapore's research community, supporting computationally intensive research in fields such as climate and weather research, materials and chemical sciences, genetics and healthcare, advanced modelling and simulation, and big data analytics.

Compared to ASPIRE 1, ASPIRE 2A provides:

- More than 3.5 times the processing cores
- A 5-fold reduction in physical footprint (with 1.5 times fewer nodes)
- Double the number of NVIDIA GPUs
- Seven times the computational power

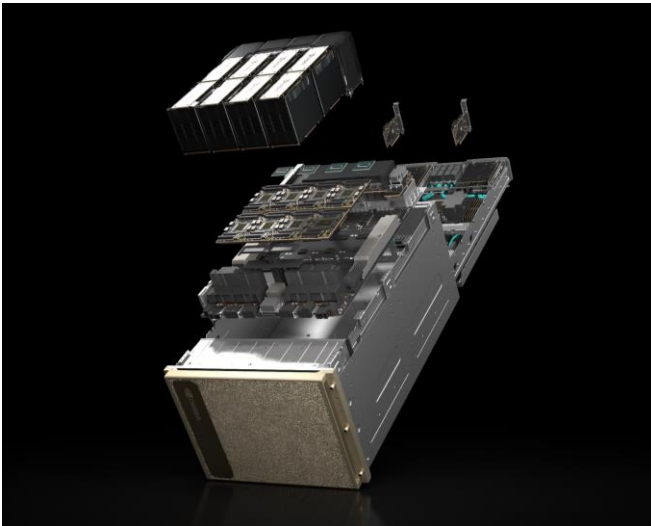
Specifications of ASPIRE 2A:

- 105,984 Cores (CPU - AMD EPYCTM 7713)
- 1,024 Cores (AMD EPYCTM 75F3)
- 352 NVIDIA A100 Tensor Core GPUs
- 476 TB (Total System Memory)
- 25 PBytes Storage (Spinning + Nearline); 10 PBytes (Scratch Disk)

For more information about ASPIRE 2A and our data centre, please visit: <https://www.nsc.sg/aspire-2a/>

Advanced Supercomputer for Petascale Innovation Research & Enterprise (ASPIRE) 2A+

ASPIRE 2A+ consists of NVIDIA DGX SuperPOD with NVIDIA DGX H100 systems, providing advanced accelerated computing capable of supporting research in areas such as AI, large language models and machine learning as well as advanced materials research, biomedical and health sciences under the AI for Science effort. With an estimated 20 PFLOPS of raw compute power at FP64 Tensor Core precision, it will significantly enhance Singapore's ability to lead research in emerging technologies.



NVIDIA DGX H100 systems are the foundation of the ASPIRE 2A+ supercomputer, which is an NVIDIA DGX SuperPOD.



The ASPIRE 2A+ supercomputer is an NVIDIA DGX SuperPOD built with NVIDIA DGX H100 systems.

Specifications of ASPIRE 2A+:

- A DGX SuperPOD with 40 DGX H100 systems, containing a total of 320 NVIDIA H100 GPUs
- 400 Gb/s NVIDIA InfiniBand (Networking)
- 2TB (System Memory) per system
- 27.5 PB (Home Storage): 2.5 PB (Scratch Storage)