National Supercomputing Centre

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New initiatives launched to accelerate advancements and synergies between supercomputing, quantum computing and AI research in Singapore

- *The new Hybrid Quantum Classical Computing (HQCC 1.0) initiative will leverage the strengths of classical supercomputers and quantum computers and support the capability building and talent development needed for such hybrid platforms*
- *Separate public-private partnerships with major technology giants like Advanced Micro Devices (AMD) seek to advance and accelerate skills and capability building in both supercomputing and quantum computing*
- *These initiatives are being announced at the annual international SupercomputingAsia 2025 (SCA2025) conference which is being held in Singapore*

Singapore, 11 March 2025 — Building capabilities, advancing skillsets and developing talent in both high performance computing (HPC) and quantum computing are part of key national efforts to converge and leverage the strengths of both these leading-edge computational platforms to advance research.

With the theme "HPC & Quantum: Empowering AI, Science, and Innovation," SupercomputingAsia 2025 (SCA25), co-organised by NSCC Singapore and regional HPC partners, focuses on classical and quantum computing to tackle complex global challenges. At the opening of the event, Guest-of-Honour, Minister for Digital Development and Information, Mrs. Josephine Teo, gave a speech where she announced a new national initiative in hybrid quantum-classical computing (HQCC). She also witnessed the signing of two Memorandum of Understanding (MoUs) between NSCC Singapore and Advanced Micro Devices (AMD), and between NSCC Singapore and CSC Finland, respectively.

The newly announced HQCC 1.0 initiative led by the National Quantum Office (NQO) builds on the expertise at the National Quantum Computing Hub (NQCH), leveraging NSCC Singapore's HPC infrastructure, alongside the middleware and software development expertise from A*STAR Institute of High Performance Computing (A*STAR IHPC) and Centre for Quantum Technologies (CQT). The National Research Foundation (NRF) has set aside S$24.5 million to seed capabilities in HQCC. The initiative seeks to position Singapore as an early mover, focusing on attracting, developing, and retaining talent while driving industrial applications in computational biology, finance, and logistics. By integrating quantum computing with classical HPC, HQCC 1.0 will strengthen sovereign capabilities, enhancing national competitiveness in next-generation computing. The grant will be used to support research in hybrid computing middleware, algorithms, and software tools, enabling closer integration between HPC and quantum technologies.

Several strategic partnerships are also being formalised at SCA2025. This includes a MoU between NSCC Singapore and AMD to establish a Centre of Excellence (COE). The COE will drive innovation, talent development, and HPC-driven solutions across key sectors by leveraging AMD's latest portfolio of processors and accelerators, tools, applications, and development platforms designed to advance HPC and AI research.

NSCC Singapore and CSC Finland, which manages one of the European Union's most powerful supercomputers, LUMI, signed a new MoU to explore collaboration across a number of thematic areas. These include collaboration to promote the use of HPC, sharing best practices and

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knowledge on HPC systems, and developing HPC capabilities for research in areas like AI, HPC-Quantum, digital twin technologies, and green data centre technologies, among others. The MoU also paves the way for the Singapore and Finland national HPC centres to explore joint workshops and training, talent development opportunities and cooperation in other international multilateral initiatives.

“Through strategic partnerships with ecosystem partners, public agencies and industry, we are advancing software, algorithms, and AI-driven modelling, while equipping researchers with the tools and expertise to optimise their workloads,” said Dr. Terence Hung, Chief Executive of NSCC Singapore. “Hybrid quantum-classical computing represents a new frontier for Singapore where the unique qualities of both technologies are being brought to bear to strengthen Singapore’s competitive edge on the global stage.”

"The HQCC 1.0 Initiative is a strategic step in advancing Singapore’s quantum computing capabilities through bridging quantum and classical systems. By developing a robust hybrid quantum-classical computing ecosystem, we aim to accelerate real-world applications in areas such as computational biology, finance, and logistics. This initiative will also help grow a critical mass of talent and industry collaborations.” said Mr. Ling Keok Tong, Executive Director of the NQO.

“AI and high performance computing continue to drive innovation across industries, and collaboration is critical to pushing the boundaries of what’s possible” said Mr. Travis Karr, Corporate Vice President, Commercial AI and HPC Business Development, AMD. “Through this collaboration with NSCC Singapore, we aim to empower the local HPC and AI community with the exceptional compute power of AMD Instinct™ accelerators and foster a collaborative open software ecosystem, catalysing the pace of HPC and AI innovation in Singapore.”

Talent development is also part of the focus to enhance the capabilities of the local research community. NSCC Singapore is expanding its efforts in talent development through the launch of the Young Investigator Seed Project (YISP) and its collaboration with Digital Industry Singapore (DISG) on a compute pilot initiative for small and midsize enterprises (SMEs) and startups.

YISP is designed to support early-career researchers, while the industry collaboration with DISG will enable SMEs and startups to leverage HPC resources for research and innovation, and receive training on using on-premise HPC resources.

Both initiatives are part of NSCC Singapore’s new thrust, which is aimed at streamlining, prioritising and optimising the allocation of national HPC resources. By providing training and access to supercomputing resources, these programs empower early-career researchers, SMEs, and startups to accelerate research, drive innovation, and enhance their competitive edge in the market.

National Supercomputing Centre (NSCC) Singapore

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National Quantum Office

国家量子署

Mr Ling Keok Tong, Executive Director, National Quantum Office

林克丹先生, 执行署长, 国家量子署

Advanced Micro Devices (AMD)
超微半导体 (AMD)

Travis Karr, CVP, Commercial AI and HPC Business Development
Travis Karr，人工智能(AI) 与 高性能计算 (HPC)业务发展的企业副总裁, AMD

Enclosed:
Annex A – Background of Announcements

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About SupercomputingAsia 2025
Co-organised by HPC centres from Singapore, Japan and Australia, SupercomputingAsia 2025 (SCA2025) is an annual conference that encompasses an umbrella of notable supercomputing and allied events in Asia. SCA2025 will be held at Sands and Expo Convention Centre from 10 to 13 March 2025.

The key objective of the SupercomputingAsia conference is to promote a vibrant and relevant HPC ecosystem in Asia. Delegates will gain access to visionary insights from thought leaders in academia and industry, optimum networking opportunities and the supercomputing community in Asia. The conference co-organisers include the National Supercomputing Centre (NSCC) Singapore, RIKEN Center for Computational Science (R-CCS), Research Organization for Information Science and Technology (RIST), Pawsey Supercomputing Centre and the National Computational Infrastructure (NCI) Australia. Since 2018, the SCA conference series has quickly grown to become a key meeting and networking platform for the HPC and supercomputing value chain for Asia and internationally. Partners share new insights, discuss trends and present the latest advances in the development of HPC. The conference attracts international delegates including mid- and C-level executives, principal researchers and HPC professionals from academia, industry and the public sector. For more information, please visit: https://sca25.sc-asia.org/

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 Singapore 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 Singapore catalyses national research and development initiatives, develops HPC skillsets and applications, and enhances Singapore's research capabilities. For more information, please visit: https://www.nscc.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/

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ANNEX A – Background of Announcements

Launch of Hybrid Quantum Classical-Computing (HQCC 1.0)

The launch of HQCC 1.0, presents a significant milestone in high performance computing (HPC) and quantum computing for Singapore. Led by National Quantum Office (NQO) the initiative builds on the expertise at the National Quantum Computing Hub (NQCH), leveraging NSCC Singapore's HPC infrastructure, alongside the middleware and software development expertise from A*STAR Institute of High Performance Computing (A*STAR IHPC) and Centre for Quantum Technologies (CQT).

The initiative will focus on developing engineering and scientific talent in HQCC, equipping Singapore with the expertise needed to lead in this emerging field. Additionally, it will address the global need for middleware solutions to integrate quantum and classical computing hardware, strengthening the foundation for a robust HQCC infrastructure.

HQCC 1.0 aims to advance middleware development and hybrid algorithms, enabling seamless quantum-classical integration and maximising computational efficiency. These partnerships will ensure industry relevance and accelerate progress in hybrid computing research.

Centre of Excellence (COE) between NSCC Singapore and Advanced Micro Devices (AMD)

The strategic partnership between NSCC Singapore and AMD marks an advancement towards strengthening HPC and AI capabilities in Singapore. The COE will drive progress in four key areas: Joint Research and Development (R&D), Upskilling and Training, Technology Access, and Open Software Ecosystem Development. Through this collaboration, NSCC Singapore and AMD will co-develop capabilities and applications that leverage AMD Instinct™ Accelerators to enhance computational efficiency in AI, modelling, and simulation. The partnership will also facilitate the exchange of scientific, academic, and technical knowledge, driving new breakthroughs in HPC and AI research.

To support skills development and industry adoption, the partnership will introduce jointly run educational seminars, technical workshops, and specialised training programs aimed at equipping researchers and industry professionals with expertise to fully utilise HPC and AI technologies.

Beyond infrastructure and talent development, the collaboration will also focus on building an open software ecosystem, supporting diverse tools, libraries and development platforms to foster closer engagement between developers, researchers, and industry partners.

Memorandum of Understanding (MoU) between NSCC Singapore and CSC Finland

The newly signed MoU between NSCC Singapore and CSC Finland will allow both organisations to collaborate deeper to enhance high performance computing (HPC) capabilities, foster knowledge exchange, and optimise computational resources over the next three years. The partnership will also explore joint initiatives in AI, HPC-Quantum operations, and digital twin technologies, as well as benchmarking efforts to enhance efficiency and performance of HPC applications.

Both organisations will coordinate contributions to international multilateral initiatives, such as the Trillion Parameter Consortium (TPC) and the Alliance of Supercomputing Centres (ASC). Additionally, the collaboration will look at strengthening high-speed connectivity and big data transfer between Finland, the EU, and Singapore, supporting green data centre innovations, and advancing talent mobility and exchange programmes. Through joint workshops, training sessions, and symposiums, CSC Finland and NSCC Singapore aim to strengthen regional and

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international collaboration, fostering practical advancements in HPC research, infrastructure development, and real-world applications.

Young Investigator Seed Project (YISP) and NSCC Singapore's collaboration with Digital Industry Singapore (DISG) on a compute pilot initiative for SMEs and startups

As part of its commitment to strengthening national research capabilities, NSCC Singapore has introduced new initiatives that set aside a small portion of its compute resources to supporting capability and talent development in Singapore. Selected researchers from research institutes, universities, SMEs and startups will be enabled with access to high performance computing resources.

YISP

The YISP program is designed to support promising early-career researchers, typically those within seven years of obtaining their PhD. In collaboration with Singapore's Institutes of Higher Learning (IHLs) who have helped to identify the candidates, research projects under YISP were onboarded in January 2025. Their work is related to a variety of research fields such as AI/ML for large language models (LLMs), cybersecurity, safe driving technology, and mental health applications.

The first cohort of YISP researchers representing a total of 20 research projects were selected from National University of Singapore (NUS), Nanyang Technological University (NTU), Singapore University of Technology and Design (SUTD), Singapore Institute of Technology (SIT), and A*STAR. Their projects will be given access to supercomputing resources till 31 December 2025.

NSCC Singapore's collaboration with Digital Industry Singapore (DISG) on a compute pilot initiative for SMEs and startups

NSCC Singapore has allocated some of its HPC resources to support local SMEs and startups, helping enhance commercial competitiveness and talent capability building as part of a holistic approach to driving HPC usage adoption and development in Singapore.

NSCC Singapore has partnered DISG, a joint office of the Economic Development Board (EDB), Enterprise Singapore (EnterpriseSG), and Infocomm Media Development Authority (IMDA), to support SMEs and startups in accessing NSCC Singapore's supercomputers and training. Through a compute pilot initiative, participating SMEs and startups will gain access to on-premise supercomputing resources that have the potential to catalyse HPC-driven industry research, accelerate innovation, and improve the competitive advantage of local enterprises.

NSCC Singapore and DISG had identified eligible SMEs and start-ups from the local technology ecosystem and invited them to apply for the pilot. Evaluations are ongoing and selected companies will be given access to NSCC Singapore's HPC resources and training, enabling them to leverage supercomputing power for their R&D efforts. These SMEs and startups will be charged preferential rates for the usage of the national HPC resources.