Five Singapore research projects approved for 1 million node hours of high-performance computing resources on the world's fastest supercomputer, Japan's Fugaku system

The successful project awardees from Singapore span a number of research fields including materials research, advanced manufacturing & engineering and urban solutions & sustainability.

Singapore, 18 March 2022 – In an agreement signed between Japan's Research Organization for Information Science and Technology (RIST) and National Supercomputing Centre (NSCC) Singapore in November 2021, Singapore researchers were granted regular access to the world's most powerful supercomputer, Japan's Fugaku system. In the first such arrangement of its kind outside of Japan, Singapore researchers can now apply for available resources through an annual Call for Projects to Fugaku, which is facilitated by NSCC in partnership with RIST. The access to Fugaku's ARM chip-based architecture and compute power helps local high-performance computing (HPC) researchers broaden their experience by working on advanced CPU and interconnect technologies which are not available in Singapore. The collaboration also strengthens the well-established links between the national HPC centres of Singapore and Japan and contributes to the development of the high-performance computing field in both countries.

The first Call for Projects to Fugaku was launched in December 2021 with a total of 16 applications received. The applications were assessed by a panel of HPC experts from Singapore and Japan.

Five Singapore research projects were shortlisted, selected and finally approved by RIST to start using the Fugaku supercomputer system from April 2022. The projects will be given a maximum duration of one year for each project to use the approved resources. The successful projects and their institutions are listed below.

Name of project	Organisation
Excitonic Effects in Nonlinear Optical Processes of Emerging Materials	National University of Singapore (NUS)
Simulation of Air-Sea Interactions with AI-Accelerated Computational Fluid Dynamics	National University of Singapore (NUS)
Big HPC Code Implementing the Adjoint-state Travel-time Tomography Method	Nanyang Technological University (NTU)
Ultra-large Molecular Dynamics Simulations of Complex Concentrated and Gradient Nanostructured Alloys for Engineering Applications	Agency for Science, Technology and Research (A*STAR)
Designing Stable, Active, and Selective Ni-based Nanoparticles for Dehydrogenation of Liquid Organic Hydrides	Nanyang Technological University (NTU)

More details about the projects can be found at https://www.hpci-office.jp/materials/e_adoptionlist2021_11_nscc.pdf

The annual Call for Projects to Fugaku via NSCC and RIST is in addition to NSCC's national Call for Projects, which are held every six months for all Singapore-based research projects. The additional access to Fugaku will give Singapore researchers more options for resources to meet their high-performance computing (HPC) needs. Singapore researchers will also have upgraded national HPC resources to tap on when Singapore's newest supercomputer system, with an aggregated raw compute power of up to 10 PFLOPS, comes online in the second half of 2022.

The Call for Projects will be regularly published on NSCC's websites at www.nscc.sg and https://help.nscc.sg/project-calls.

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About the National Supercomputing Centre (NSCC) Singapore

The National Supercomputing Centre (NSCC) Singapore was established in 2015 to manage Singapore's national petascale facilities and high-performance computing (HPC) resources. As a National Research Infrastructure funded by the National Research Foundation (NRF), the HPC resources that we provide helps support the research needs of the public and private sectors, including research institutes, institutes of higher learning, government agencies and companies. With the support of our stakeholders, for example, the Agency for Science Technology and Research (A*STAR), Nanyang Technological University (NTU), National University of Singapore (NUS), Singapore University of Technology and Design (SUTD), National Environment Agency (NEA) and Technology Centre for Offshore and Marine, Singapore (TCOMS), NSCC catalyses national research and development initiatives, attracts industrial research collaborations and enhances Singapore's research capabilities. For more information, please visit https://www.nscc.sg/.

About Research Organization for Information Science and Technology (RIST)

Research Organization for Information Science and Technology (RIST) is a general incorporated foundation in Japan. Since FY 2012, RIST has been carrying out the usage promotion service of the “Specific High-speed Computer Facilities” (then the K computer, now the supercomputer Fugaku since FY 2020), as the “Registered Institution for Facilities Use Promotion” based on the “Act on the Promotion of the Public Utilization of the Specific Advanced Large Research Facilities”, and has also been in charge of the usage promotion services , which are part of the management of the “innovative High Performance Computing Infrastructure (HPCI)”. The “innovative HPCI” is a publicly-called project commissioned by the Ministry of Education, Culture, Sports, Science and Technology (MEXT). For more information, please visit https://www.rist.or.jp/ehome.html.

About Supercomputer Fugaku

The supercomputer Fugaku is co-developed by RIKEN and Fujitsu as a successor of K computer. Fugaku is created to contribute to the growth of Japan by solving social and scientific problems, and to make world-leading achievements. It has the world's top-class abilities in various ways, such as power performance, computational performance, and user-friendliness, as well as characteristics that can lead users to breakthroughs or can accelerate studies in big data and AI. Fugaku features 158,976 processors and can perform 442,010 trillion calculations per second. It has successfully retained the top spot for four consecutive terms on all four of the major supercomputer rankings since June 2020. It is proven to have the world's top-class performance.