

[EMBARGOED TILL 1230HRS (+8GMT), 23 OCTOBER 2023]

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23 October 2023

Singapore and France Strengthen Research, Innovation and Enterprise (RIE) Partnerships at 3rd Joint Committee on Science and Innovation Meeting

New agreements and collaborations signed for joint Master and PHD programmes, Women's Health, Circular Economy, Fusion Energy, and Quantum Research

The third meeting of the France-Singapore Joint Committee on Science and Innovation (JCSI) was held at the Campus for Research Excellence and Technological Enterprise (CREATE¹) on 23 October 2023. Singapore's Deputy Prime Minister (DPM), Coordinating Minister for Economic Policies, and Chairman of National Research Foundation (NRF), Mr Heng Swee Keat, and France's Minister of Higher Education and Research, Ms Sylvie Retailleau, were Guests-of-Honour at the meeting.

2 The JCSI aims to deepen bilateral cooperation in science and technology between Singapore and France. At the JCSI meeting in Singapore, both DPM Heng and Minister Retailleau discussed the progress of current research and innovation partnerships in Artificial Intelligence, quantum technology and circular economy with close to 100 senior academics, researchers, and industry leaders. Potential collaboration in space, nuclear (safety and fusion energy), health, and maritime and port initiatives were also on the agenda.

3 Organised by the NRF and the French Ministry of Higher Education and Research (MESR) in coordination with the French Ministry for Europe and Foreign Affairs (MEAE), this is the first time the JCSI meeting has been hosted in Singapore². The session was co-chaired by Mr Beh Kian Teik, Chief Executive Officer of NRF, and Dr Claire Giry, Director-General for Research and Innovation of France's Ministry of Higher Education and Research.

4 France and Singapore, which are priority partners, are countries of scientific excellence with strong links, as reflected in existing collaborations and co-publications between the two countries. The Singapore National Research Foundation (NRF) and the French National Research Agency - *Agence Nationale de la Recherche* (ANR) are collaborating to support joint research projects and look towards working more closely to align these with strategic themes. This step marks a significant evolution in the bilateral collaboration, affirming the willingness of the two countries to step up their scientific cooperation.

5 DPM Heng and Minister Retailleau witnessed the signings of eight agreements and collaborations at the sidelines of the meeting. The new initiatives will enhance the Research and Innovation and Enterprise ecosystems of both countries. With deeper bilateral ties, French and Singaporean scientists, innovators, and entrepreneurs can pool their expertise to undertake ambitious projects that address existential challenges such as climate change, social needs, and technologies of tomorrow.

¹ CREATE (Campus for Research Excellence and Technological Enterprise) hosts the National Research Foundation's interdisciplinary research centres from top universities. For more information refer to create.edu.sg.

² The inaugural JCSI meeting took place in Paris in November 2019, while the second JCSI meeting was held virtually in June 2021.

Strengthening collaborations for a thriving Science and Technology ecosystem

6 The eight research agreements and collaborations signed at the 3rd JCSI were on talent development, quantum technology, healthcare, and sustainable energy solutions and alternatives. These partnerships are in:

- a. Scaling up prototypes that recycle and recover resources from e-waste using environmentally friendly methods to industrial-scale pilot testbeds with industry partners.
- b. The research and development of Science and Technologies in the field of magnetic fusion for clean energy.
- c. Developing Science and Technology (S&T) talents in electrical and electronic engineering, material science and engineering, physics, photonics, quantum technologies and sustainable technologies through joint Master and Ph.D. programmes.
- d. Advancing research, education and outreach activities related to women's health across the lifespan.
- e. Developing quantum logic gates— a key component used in computing – through an intra-create project on Nanophotonics Gates with exciton-Polaritons.
- f. Conducting cutting edge research in quantum information science, quantum-controlled systems, quantum matter, and quantum thermodynamics, energetics, and resources.

Singapore's Deputy Prime Minister, Coordinating Minister for Economic Policies, and Chairman of the National Research Foundation, Heng Swee Keat said, "Singapore and France have extensive collaborations across the science and technology ecosystem, ranging from research to talent exchanges. I am happy to note that there has been excellent progress in the areas of collaboration we had embarked on. These will be expanded with today's MOU signings. Singapore is glad to have a like-minded partner like France, who share our belief that science must be global, so that its benefits can uplift people and communities everywhere. As a Global-Asia node for research, innovation and enterprise, Singapore will always remain open-minded to new perspectives, and seek new partnerships to build a more innovative, sustainable, and resilient future for all."

France's Minister of Higher Education and Research, Ms Sylvie Retailleau said, "Singapore is a strategic partner for France and our two countries have a strong and long scientific relationship. I am convinced our researchers have a lot to win working more closely together. The dialogue we are having today is essential and it will be remembered as a milestone in the strengthening of French-Singaporean cooperation in higher education, research, and innovation. We are willing to make the French-Singaporean joint committee evolve to become not only a tool of dialogue and visibility, but also a tool for structuration and perspective of our cooperation, with a deeper strategic dimension."

Refer to ANNEX A and B for a brief on current collaborations and priority areas discussed at the 3rd JCSI meeting. ANNEX C provides details of the partnerships signed at the 3rd JCSI meeting.

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Media Contacts

NRF Singapore

Mr Nur Amin
Deputy Head, Corporate Communications
National Research Foundation
DID: +65 81891029
Email: nur_amin@nrf.gov.sg

Ms Suzanne Walker
Deputy Director, Corporate Communications
National Research Foundation
Mobile: +65 98738181
Email: suzanne_walker@nrf.gov.sg

Embassy of France in Singapore

Ms Rim Meliani
Press Attachée
Embassy of France in Singapore
T: (+65) 6880 7836
M : (+65) 9114 5337
Email : rim.meliani@diplomatie.gouv.fr

About The National Research Foundation

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.

Learn more about the NRF at www.nrf.gov.sg

About The French Ministry of Higher Education and Research

The Ministry of Higher Education and Research (MESR) is in charge of preparing and implementing the Government's policy on the development of higher education, research and technology.

Learn more about the MESR at <https://www.enseignementsup-recherche.gouv.fr/fr>

About The French Ministry for Europe and Foreign Affairs

The Ministry for Europe and Foreign Affairs represents, defends and promotes the interests of France and French nationals in all areas in foreign countries and international organizations. Its main objectives are : (i) to achieve peace, security and respect for human rights, (ii) to promote French businesses abroad in foreign markets and France's appeal abroad, (iii) to help organize globalization which ensures balanced and sustainable development in the world, (iv) to ensure the presence of France's ideas, language and culture while advocating cultural diversity, (v) to manage security and administrative services for French nationals abroad.

Learn more about the MEAE at <https://www.diplomatie.gouv.fr/fr>

ANNEX A

1. Both DPM Heng and Minister Retailleau were briefed on on-going collaborations between Singapore and France at the 3rd JCSI meeting. Main joint programmes in artificial intelligence, quantum technology and circular economy are:
 - a. ***DEciSion Making in Critical uRban Systems Programme (DesCartes)***
The DesCartes programme aims to develop a disruptive, multi-purpose cross-disciplinary tool, that is based on a hybrid of AI-Physics-Engineering-Human centric approaches, to support and empower decision-making in urban critical systems. It is hosted by CNRS@CREATE, as part of NRF's CREATE³ initiative.
 - b. ***CNRS's International Research Lab (IRL) for quantum science and technologies, MajuLab***
The centre plays a significant role in structuring Singapore-France cooperation in quantum science and technologies. Collaboration between Singapore and France in this area was renewed at the 3rd JCSI.
 - c. ***NTU-Singapore-CEA Alliance for Research in Circular Economy (SCARCE)***
The partnership between Singapore's Nanyang Technological University (NTU) and the French Alternative Energies and Atomic Energy Commission (CEA) has successfully developed pioneering methods for the green recycling of e-waste, such as used batteries, silicon solar panels and printed circuit boards. The collaboration was extended for Phase 2 at the 3rd JCSI meeting.

³ The DesCartes programme comprises researchers from CNRS, National University of Singapore (NUS), Nanyang Technological University (NTU), Singapore University of Social Sciences (SUSS), A*STAR, 15 institutions in France and abroad* and 7 industrial partners**.

* ENSAM, U. Toulouse Paul Sabatier, UGA, UCA, ENAC, U. Strasbourg, PSL, Grenoble INP, U. Jean Moulin, ENSEEIHT, U. Paris Saclay, U. Bordeaux, U. Laval, U. Zaragoza, and TU Eindhoven.

** CETIM MATCOR, ARIA Technologies, Thales, ESI, EDF, Naval Group, and SKF.

ANNEX B

1. At the 3rd JCSI, DPM Heng and Minister Retailleau were briefed on four priority areas (space, nuclear safety & fusion energy, health, maritime) which were discussed earlier by the JCSI. The meeting heard updates on:
 - a. Singapore's Office for Space Technology & Industry (OSTIn) and Centre National D'Études Spatiales (CNES) collaborations, including in the framework of the Space Climate Observatory, an international initiative initiated in the framework of the One Planet Summit (Paris, 2017) which aims to gather public and private entities involved in the Earth Observation (EO) sector.
 - b. The creation of a joint laboratory between the French Institute for Radiological Protection and Nuclear Safety (IRSN) and the Singapore Nuclear Research and Safety Initiative (SNRSI) from NUS for collaborative research projects in radiobiology, radiochemistry, and nuclear safety simulations, staff exchanges and training.
 - c. Research collaborations between NTU and the French Alternative Energies and Atomic Energy Commission (CEA) in the fields of fusion energy and circular economy. NTU-Singapore-CEA Alliance for Research in Circular Economy (SCARCE) presented an update on its ongoing and future activities for Phase 2, which will run from 2023 to 2028. SCARCE is supported by NRF and Singapore's National Environment Agency (NEA) under its Closing the Resource Loop Funding Initiative.
 - d. Perspectives of collaboration between the Agency for Science, Technology and Research's (A*STAR) Infectious Diseases Labs (ID Labs) and the Institut Pasteur de Paris and its international network, as well as opportunities to further develop exchanges between French National Institute of Health and Medical Research (INSERM) and Singapore stakeholders in the field of health, particularly in the areas of infectious diseases, ageing and metabolic diseases.
 - e. Mutual interests from the French National Centre for Scientific Research (CNRS) and Singapore partners such as the Maritime and Port Authority of Singapore (MPA) and A*STAR research institutes to pursue a collaborative approach empowering DesCartes digital twins to advance maritime and port innovations, and the areas of potential synergy.

1. The new agreements and renewed collaborations at the 3rd JCSI meeting were:
 - a. To scale up prototypes that recycle and recover resources from e-waste using environmentally friendly methods, to industrial-scale pilot testbeds with industry partners, the Nanyang Technological University of Singapore (NTU) and the French Alternative Energies and Atomic Energy Commission (CEA) extended their collaboration for Phase 2 of the NTU-Singapore-CEA Alliance for Research in Circular Economy (SCARCE).
 - b. NTU and CEA signed a research collaboration agreement to conduct research on hot plasmas confined by intense magnetic fields with Artificial Intelligence and Machine Learning through the Singapore Alliance with France for Fusion Energy, or "SAFE".
 - c. NTU and Université Paris Sciences et Lettres (PSL) signed an agreement for a joint PhD programme in electrical and electronic engineering, material science and engineering, physics, photonics, quantum technologies and sustainable technologies, and a letter of intent for a joint Masters' programme.
 - d. The Global Centre for Asian Women's Health, Yong Loo Lin School of Medicine, National University of Singapore (GloWNUS) and Faculty of Health, Université Paris Cité signed a memorandum of understanding (MOU) to conduct research, education and outreach activities that considers a global health approach to address women's health concerns across the lifespan. NUS and Université Paris Cité also renewed their partnership to facilitate international cooperation and promote research collaborations in academic fields of mutual interest.
 - e. A research collaboration agreement with Singapore's NUS, NTU, Agency for Science, Technology and Research - Institute of Materials Research and Engineering (A*STAR-IMRE), CNRS@CREATE and France's Centre National de la Recherche Scientifique (CNRS), Sorbonne Université (SU) and PSL was signed for an intra-CREATE project on Nanophotonics GATes with exciton-Polaritons (N-GAP).
 - f. The renewal agreement of MajuLab joint laboratory was signed between France's CNRS, SU, Université Côte d'Azur (UCA), and Singapore's NUS and NTU to conduct cutting edge research in quantum information science, quantum-controlled systems, quantum matter, and quantum thermodynamics, energetics, and resources.

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