



CAMBRIDGE CARES CAMBRIDGE CENTRE
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JOINT NEWS RELEASE

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CREATE CARES and NTU Singapore's NTUitive launch the Accelerated, Manufacturing Platform for Engineered Nanomaterials (AMPLE)

- *Supported by Singapore's National Research Foundation (NRF) Central Gap Fund*

The **Cambridge Centre for Advanced Research and Education in Singapore (CARES)** and **NTUitive**, the innovation and enterprise company of **Nanyang Technological University, Singapore (NTU Singapore)**, are collaborating to advance the development of nanomaterials.

Supported by the National Research Foundation, Singapore (NRF) with funding of S\$6.5 million, the project, **Accelerated, Manufacturing Platform for Engineered Nanomaterials (AMPLE)**, will develop both software and hardware infrastructure that supports higher efficiencies and productivity of nanomaterials, commonly used in antimicrobial coatings, energy storage devices and composite materials. The technologies will be scaled up in an automated factory adopting Industry 4.0 practices.

CARES is part of the **NRF Campus for Research Excellence and Technological Enterprise (CREATE)** programme and was established in 2013 between the University of Cambridge, NTU Singapore and the National University of Singapore.

NTUitive will support AMPLE in its Intellectual Property management, working closely with CARES on the technology development and commercialisation front, and will manage the project funding in partnership with NRF.

The funding will come from NRF's Central Gap Fund, which encourages cross-collaboration between academia and industry and aims to support the translation of research outcomes into scalable solutions that generate economic and societal benefits for Singapore.

The two-year AMPLE project will be led by **CARES Research Fellows Nicholas Jose** and **Mikhail Kovalev**; and **Professor Alexei Lapkin Principal Investigator from University of Cambridge**.

CARES Director and University of Cambridge Professor in Chemical Engineering, Prof Markus Kraft adds, "I am proud to see that the research done at CARES over the past decade continues to have a ripple effect for scalable industry applications. Emerging from work done in our flagship Carbon Reduction in Chemical Technologies programme, AMPLE bridges the gap between academic laboratory-scale research and an exciting more industry-focused solution for nanomaterial technology. CARES is delighted to have the opportunity to develop this new technology in Singapore in partnership with NTUitive and NRF."

CEO of NTUitive, Mr David Toh, said: "After 20 months of hard work, NTUitive is proud to pilot this model of academia-government partnership, where we aim to bridge the gap between research and product-to-market through the funding and scale up of promising projects with a specific outcome. The success of this multidisciplinary project between CARES and NTUitive will put Singapore in the lead position to produce novel nanomaterials, a field where the nation is already at the forefront."

During his earlier work in Cambridge and CARES, Project Lead Nicholas Jose identified that the "central gap" hindering the commercialisation of nanomaterials is the lack of a value chain to take laboratory developments to market. Whilst innovation of new technologies is moving at unprecedented rates, the long timeline to commercialisation makes investors and industries reluctant to invest, creating a "chicken or egg" dilemma.

AMPLE will fill this gap by creating a market-ready technology platform for the rapid, scalable and cost-effective manufacture of nanomaterial technologies. Compared to conventional technologies, the AMPLE approach is expected to be over 100 times more efficient, significantly reducing experimental workload and scale-up complexities and improving nanomaterial quality. The resulting reduction in the budget and time required for development will enable businesses to rapidly innovate nanomaterial-based products with fewer polluting manufacturing processes.

The idea for AMPLE came from the positive results garnered from "RINGS" (Rapid Industrialization of Next Generation Materials), a proof-of-concept project supported by the Singapore-MIT Alliance for Research and Technology (SMART) Innovation Centre Innovate Grant, which was completed in 2021.

The RINGS team (including Dr Jose, Dr Kovalev, Prof Lapkin and CARES Research Engineer Kencha Satya) successfully showed that by combining next-generation reactor technologies with machine learning, they could rapidly scale-up and improve the process efficiency of the synthesis of highly antimicrobial zinc oxides.

Working with industrial partners in the pharmaceutical, energy, and functional coatings sectors, the AMPLE project will demonstrate the ability to rapidly scale new material technologies with high quality and low cost.

Project Lead Nicholas Jose opened a spin-off company in the UK, Accelerated Materials, in 2021 to work with UK-based industry. Accelerated Materials has already attracted significant attention, including winning investment from the University of Cambridge technology transfer arm, Cambridge Enterprise.

During the course of the AMPLE project, a Singapore-based spin-off will be created to exploit the emerging technology for the benefit of Singapore and the wider world. It is anticipated that the Singapore spin-off will bring a number of benefits and establish Singapore as a leader in this exciting and novel area of innovation.

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About CARES

The Cambridge Centre for Advanced Research and Education (CARES) was established in 2013 as the University of Cambridge's first research centre outside the UK. It brings together researchers from the University of Cambridge, Nanyang Technological University, and the National University of Singapore to work on problems relevant to Singapore and the world at large.

CARES' largest programme is the Cambridge Centre for Carbon Reduction in Chemical Technology (C4T), which commenced in 2013 when CARES opened. This is a collaborative effort involving researchers from the University of Cambridge, Nanyang Technological University, and the National University of Singapore.

A further large programme began in October 2020 - the Centre for Lifelong Learning and Individualised Cognition (CLIC). CLIC brings together researchers from the University of Cambridge and NTU to focus on the neuroscience of learning.

CARES is also hosting an Intra-CREATE project called Cities Knowledge Graph, a collaborative project between the University of Cambridge and the Singapore-ETH Centre. The project aims to harness rapidly growing and diversifying data streams to improve the planning and design of cities.

CARES is a research partner in the Pharmaceutical Innovation Programme Singapore (PIPS), a public-private consortium that aims to develop full process automation in a laboratory to support R&D and manufacturing.

The latest CARES-hosted project is AMPLE which has emerged from research in the C4T programme that aims to rapidly scale-up new material technologies with high quality and low cost. AMPLE is a recipient of the Central Gap Fund supported by the National Research Foundation.

For more information, please visit <https://www.cares.cam.ac.uk/>

About NTUitive

NTUitive Pte Ltd (“NTUitive” in short) is the innovation and enterprise company – and a wholly-owned subsidiary – of Nanyang Technological University, Singapore (NTU Singapore). NTUitive manages the University’s intellectual property, promotes innovation, supports entrepreneurship, and facilitates the commercialisation of research.

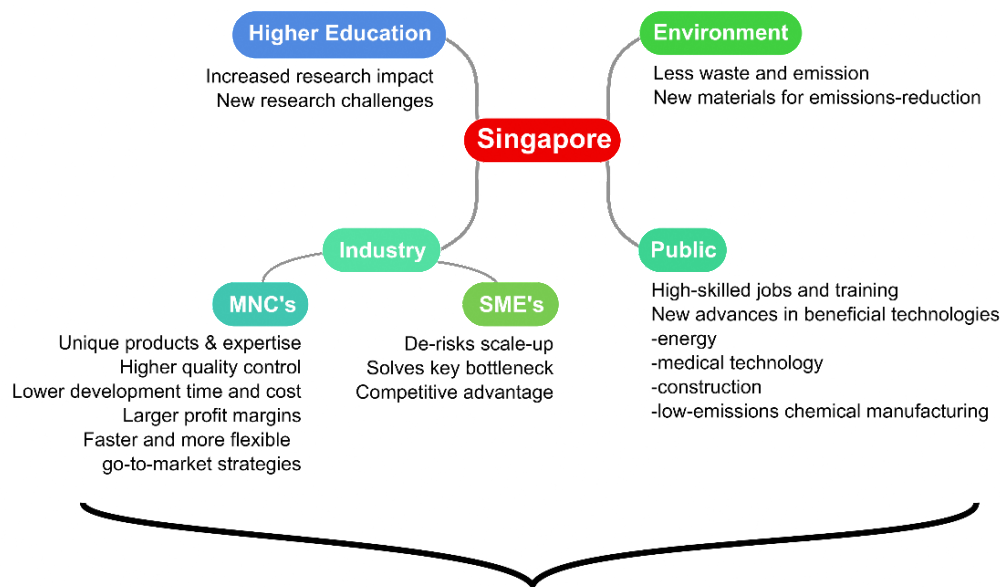
For more information, please visit <https://www.ntuitive.sg/b>

About The National Research Foundation (NRF)

The National Research Foundation (NRF) 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. The NRF aims to transform Singapore into a vibrant R&D hub that contributes towards a knowledge-intensive, innovative and entrepreneurial economy; and make Singapore a magnet for excellence in science and innovation.

For more information, please visit <http://www.nrf.gov.sg>

Annex 1



Benefits

- Nanomaterial ecosystem acceleration
- New jobs and training for high skilled labour
- Competitive advantage in materials industries
- More sustainable chemical and materials manufacturing practices
- Heightened impact from research institutes and higher education
- Reduced need on foreign sources for new materials
- Puts SG at forefront of industry 4.0 principles in materials manufacturing

The project is open to further collaborations with interested industry colleagues. For an initial informational discussion, please contact Project Lead Dr. Nicholas Jose (nicholas.jose@cares.cam.ac.uk)

This project is supported by the National Research Foundation, Singapore, under its Central Gap Fund.