

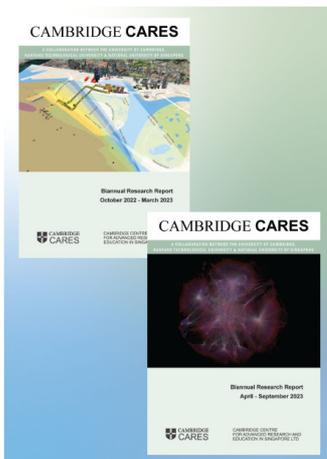


CAMBRIDGE
CARES

CAMBRIDGE CENTRE
FOR ADVANCED RESEARCH AND
EDUCATION IN SINGAPORE LTD.

CARES Biannual Newsletter Issue 3, February 2024

Highlights



Biannual Reports

Our 18th and 19th Biannual Report highlights all research programmes, small projects, and collaborations; including updated publications and



10th anniversary

On Friday 1 December 2023 we celebrated 10 years of CARES in Singapore with a Scientific Showcase and an evening reception at the British High Commissioner's Residence. Recap the



New start-up

3Y Energy, the newest CARES start-up by Dr Yichen Zong, will look to retrofit legacy engines to create compatibility with alternative fuels. The technology is being

forewords from
Cambridge PIs.

[read more >>](#)

stories and videos that
made 2023 spectacular.

[2023 highlights >>](#)

applied first in the
maritime industry.

[read more >>](#)

Acknowledgement



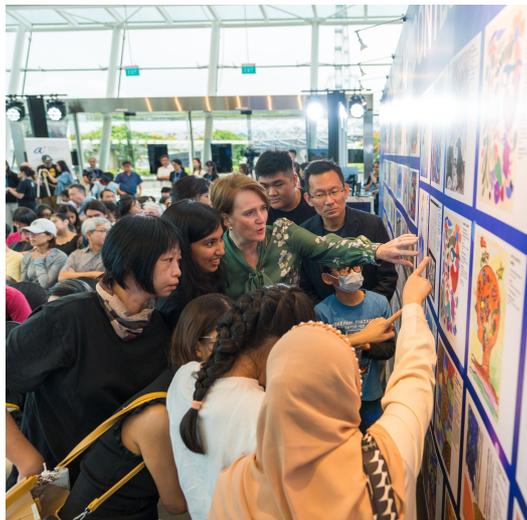
Ms Joy Haughton



Ms Elizabeth MacRae

We would like to acknowledge our CARES Chief of Staff, Joy, for her amazing contribution in the past decade to growing CARES as a research platform. As we bid farewell to Joy, we wish to welcome Liz to the role. [Joy](#) and [Liz](#) are currently in the handover period and will both remain contactable via email until Liz officially takes on the position on 29 February; all further emails should be directed to Liz.

Outreach & Engagement



A tsunami of innovations is ahead of us

Making AI think and speak like a chemist

10 years of science



What is a flame?

Sforzo et al., Comb & Flame 2015
Movie thanks to S. Menon (Georgia Tech)

Lab-scale flames from Hopkinson Lab and others

Epaminondas Mastorakos
CARES Team
Anke Yu
Ramesh Kolluru
Ramesh Kolluru
JAMIE GOH
JAMIE GOH
B Harikrishnan
B Harikrishnan
Yangyang Liu
Yangyang Liu
Chun Siang Sim
Chun Siang Sim

CAMBRIDGE CARES 29/09/2023
E. Mastorakos
10

Top Left: The CLIC programme *hosted a 2-day science festival on lifelong learning* at the Art Science Museum in Singapore.

Top Right: ChemistryViews interviewed *Prof Markus Kraft* and researchers *Dr Aleksandar Kondinski* and *Dr Xiaochi Zhou* on their research in AI.

Middle Left: CARES [compiled a list of 10 impactful research images](#) to celebrate 10 years in Singapore.

Middle Right: [Prof Francois Jerome](#) from CNRS visited in October as part of the CARES C4T Visiting Scientist Scheme to present a chemistry workshop with other speakers from NTU and A*STAR.

Bottom: Prof Epaminondas Mastorakos presented "[How combustion science decarbonises our energy system](#)" at September's session of the CREATE Webinar.

Congratulations

Dr Laura Pascazio

Won the Ricardo Award for significant advancements in combustion physics at a fundamental level.



CARES laboratory,

Improving sustainability efforts and using digital automation solutions derived from the centre's research.



CARES drone

Monitored for gas leaks during the Maritime & Port Authority's (MPA) methanol bunkering operation in Singapore.

Dr Tan Yong Ren

Recognised as a recipient of the Lee Kuan Yew scholarship fund at an event attended by the Singapore PM.

SUCCESSFUL METHANOL BUNKERING OPERATION IN SINGAPORE

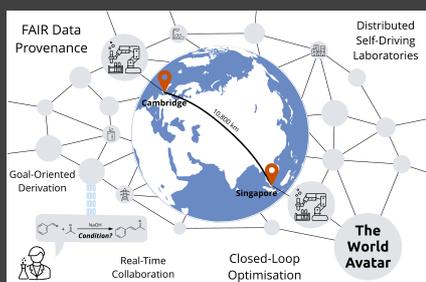


FITZWILLIAM COLLEGE LEE KUAN YEW CELEBRATION



Photo credits: Fitzwilliam College

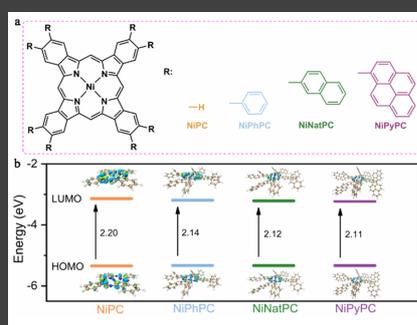
Publications



A dynamic knowledge graph approach to distributed self-driving laboratories

Jiaru Bai, Sebastian Mosbach, Connor Taylor, Dogancan Karan, Kok Foong Lee, et al.

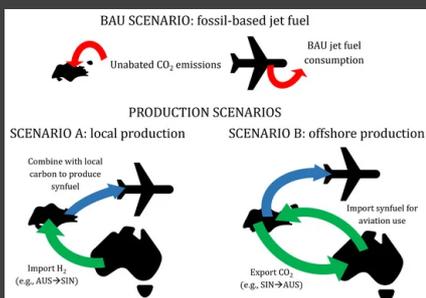
This paper presents a framework for distributed self-driving laboratories, using ontologies and autonomous agents to expedite scientific discovery. [Read the paper.](#)



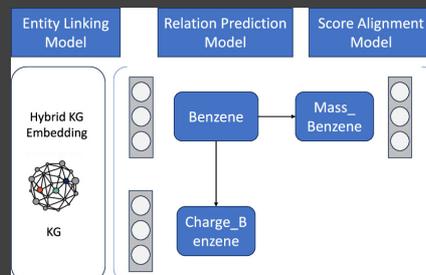
Conjugated Nickel Phthalocyanine Derivatives for Heterogeneous Electrocatalytic H₂O₂ Synthesis

Libo Sun, Xindie Jin, Su Tan, Adrian Fisher, and Wang Xin

This paper explains new derivatives used for more efficient H₂O₂ production. [Read the paper.](#)



Feasibility of Green Hydrogen-



Marie and BERT—A Knowledge Graph Embedding Based Question Answering System for Chemistry

Xiaochi Zhou, Shaocong Zhang, Mehal Agarwal, Jethro Akroyd,

Based Synthetic Fuel as a Carbon Utilization Option: An Economic Analysis

J. Lemuel Martin and S Viswanathan

This paper assesses the economic viability of green hydrogen-based synthetic fuel production, revealing overseas production as more cost-effective. [Read the paper.](#)

Sebastian Mosbach, and Markus Kraft

This paper introduces a hybrid KGQA system employing operations such as multiple embedding spaces, score alignment, implicit multihop relations, and BERT-based entity-linking for accurate information retrieval. [Read the paper.](#)

CARES is open to collaborating with new partners and projects. Please see our [Careers page](#) for a list of opportunities or email enquiries@cares.cam.ac.uk

Thank you for reading this #CambridgeCARES newsletter, follow our social channels for any updates!

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 Twitter

 YouTube

 Website

CARES was established in 2013 in Singapore and is the University of Cambridge's first research centre outside the UK.

Flagship C4T programme on decarbonisation
CLIC studies cognitive flexibility throughout the life course
AMPLE scales up nanomaterial production
PIPS is an industry-funded project for pharmaceutical manufacturing
Knowledge Graph Driven P2P Energy Trading focuses on the energy market

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