

**FLEET News: August 2022**

This month we introduce one of the first projects to get funded by the **FLEET Translation Program**, with a Swinburne/RMIT team aiming to deliver 'what you see is what you get' materials and heterostructures for the advanced materials manufacturing sector.

And on a related note, we welcome **Sumeet Walia** as FLEET's new Industrial Relations Committee Chair. Good luck for Eureka Prizes tonight Sumeet!



Also this month, stories below on manipulating magnetic coupling at RMIT, in-person outreach, congratulations to Nikhil Medhekar at Monash, and the atomic heart of glass at ANSTO/UOW.

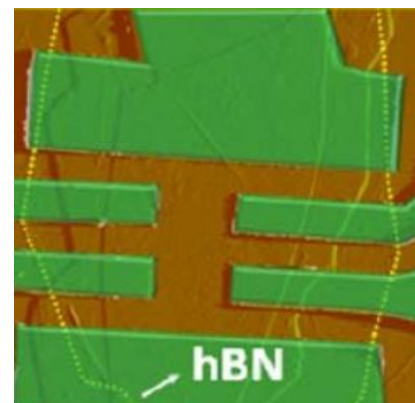
Michael Fuhrer
Director, FLEET

In this edition of FLEET News:

- **Manipulating magnetic coupling** (RMIT, UOW)
- **FLEET Translation Program: funding approved** (Swinburne, RMIT)
- **National Science Quiz**
- **Congratulations Nikhil Medhekar** (Monash)
- **The atomic heart of glass** (ANSTO, Monash, UOW)
- **New FLEET industry-relations Chair**
- **FLEET seminar: Quantum nanophotonics**
- **Equity & diversity**
- **Congratulations to our ECR authors this month**
- **Conferences, past talks and other opportunities**

Manipulating interlayer magnetic coupling for future spintronics

The first electric control of exchange-bias effect, led by FLEET Research Fellow Sultan Albarakati (RMIT), provides a promising platform for future energy-efficient, beyond-CMOS spintronics. Scalable, energy-efficient spin-orbit logic is enabled at structure interface between antiferromagnetic and ferromagnetic materials. **Read more online.**



Translation funding

Swinburne/RMIT PhD candidates Mitch Conway, Abby Goff, and Jack Muir will use \$31,000 funding from the FLEET Translation Program to present a 'catalogue' of prefabricated, high-quality 2D TMDs and heterostructures for purchase on a novel online sales platform, with a series of optical characterisations, providing customers with confidence that what you see is what you get.



“The aim of this service is to minimise time needed for in-house synthesis, freeing up researchers' time to actually work on the projects that really matter to them”.

[Read more online.](#)

National Science Quiz

Over 200 in-person audience members and more than 400 online contestants competed in this month's National Science Quiz, co-presented by FLEET with a collaboration of nine research organisations. [Read more online.](#)



Congratulations Nikhil

Congratulations to FLEET CI Nikhil Medhekar at Monash University, who has been promoted to full Professor of Materials Science and Engineering. [Read more online.](#)



Atomic! The heart of glass

So what makes glass behave differently from a crystal? A nice explainer article at ANSTO looks at the strange atomic structure of glassy materials, and studies led by FLEET's Julie Karel (Monash) and David Cortie (ANSTO/UOW) using an array of spectroscopic and diffraction techniques to investigate useful properties in future electronics such as superconducting circuits. [Read more at ANSTO.](#)



New FLEET Industry Relations Chair

New industry-relations Chair Sumeet Walia

We're pleased to report that FLEET AI, Sumeet Walia at RMIT has been nominated by the FLEET Executive Committee to chair the Industry Relations Committee from Aug 2022.

The Centre Exec and Ops Team would like to thank Torben Daeneke for his leadership in the past two years as Chair of the IR committee.

Sumeet is a finalist in the Australia Museum Eureka Prizes – short-listed for the Eureka Prize for an Emerging Leader in Science. **Watch Sumeet's explanation:** unlocking new phenomena in materials. **And watch the announcements tonight online, from 7.30pm.**



FLEET seminar: Quantum nanophotonics

FLEET seminar next week will look at hBN's potential to become the leading platform for integrated quantum photonics. If you'd like to join us online, please **register now**.

FLEET SEMINAR

Quantum nanophotonics with Hexagonal Boron Nitride

Prof. Igor Aharonovich, University of Technology, Sydney

Wednesday 13 September 2022
11:00 AM AEST

FLEET

Equity & diversity resources/networking

New 'Quantum Women' network helps connect women in Australia's quantum industry. A new article with founders Biliانا Rajevic (Quintessence Labs) and Irene Fernández de Fuentes (PhD student UNSW) discusses why the network was founded, and its impact so far. **Read online.**

ECR authors in August

Congratulations to our early-career researchers who were first, second or third authors on papers published this month: Cheng Tan, Daniel Sando, Jinling Zhou, Lawrence Farrar, Meri Algarni, Michael Lord, Qingdong Ou, Sultan Albarakati and Tommy Bartolo. See more in **FLEET publications**.



Conferences

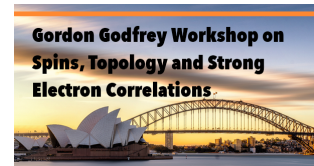
The Frontiers of Matter Wave Optics (FOMO) conference and summer school in Trieste, Italy **12-23 September** will cover matter-wave physics theory, technology, gravimetry; quantum sensing; modelling of ultra-cold quantum devices.



The Recent Progress of Graphene and Two-Dimensional Materials Research conference (RPGR2022), to be held in Taipei, Taiwan **13-17 November 2022** will cover the latest developments in graphene and other 2D crystals, and enhance 2D physics, material science and devices.



The 2022 Gordon Godfrey workshop on spins, topology and strong electron correlations will be held **21-25 November** at UNSW. An informal poster session for students and ECRs allows for very easy submission: all that's needed is a poster title, which is simply entered into the online registration form.



The 10th International Conference on Advanced Materials & Nanotechnology (AMN10) will be held in Rotorua, New Zealand, **6-10 February 2023**. This meeting is sponsored by FLEET partner organisation the MacDiarmid Institute and covers a broad variety of topics in nanotechnology and materials science. To receive updates and advise your intent to attend, please **register your interest** online.



Catch up on past talks

If you missed any recent FLEET seminars or other talks you can catch up on YouTube:

- Sergei Frolov (Pittsburgh) **Superconductors and semiconductors, nanowires and majorana modes**
- Eli Estrecho,(ANU) **Non-Hermitian topology in exciton polariton systems**
- ECR working group: **Academia and beyond Q&A videos**
- Lu Li (Michigan) **Quantum Oscillations of Electrical Resistivity in an Insulator**

Grants and opportunities

Kenneth Myer Innovation Fellowships support breakthrough solutions to social and environmental challenges, offering 12 months away from the Fellow's current role to pursue big ideas with \$120,000 plus \$30,000 expenses. EOI deadline 4 September.

The Victorian government will provide \$100 million in pre-seed investment funding to the five state universities over five years to support research commercialisation, with university startups and spinouts to receive up to \$1 million each.

Main Sequence Ventures (CSIRO's investment arm) deep-tech newsletter features over 40 companies with 300+ jobs on offer. **Sign up for the newsletter** to stay informed.

Nano Letters and ACS's new Seed Grants competition will provide US\$2500 for high-risk, high-reward nano' research proposal ideas from later-stage graduate students (third year+).

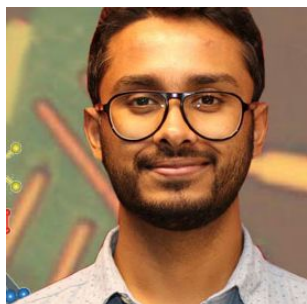
For ongoing outreach/development opportunities see **In2science** mentoring, and **CSIRO STEM Professionals in Schools**.

Interested in an **industry internship**? See active positions at **APR Interns**.

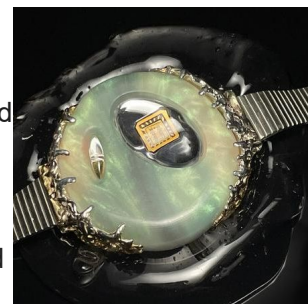
Previous news

ECR working group delivering for ECRs at FLEET 2022 FLEET's ECR training working group delivered a range of research development training sessions at the ECR workshop following the annual workshop in Wollongong. Following a career-focussed veski program, the workshop focussed on career skills development and prompted critical thought and action towards future careers. **Read more online.**

Brilliant alternative uses for diamonds FLEET AI Dongchen Qi at QUT applied RMIT liquid-metal techniques towards making diamond conductive and switchable, with possible use in beyond-CMOS diamond transistors in future electronics **Read more at QUT.**



The hetero-interface is the key New computational methods have been developed in papers led by Abin Varghese at Monash towards next-generation multifunctional optoelectronics such as flexible photosensors or LEDs. Emergent phenomena at the interface between selected materials in heterostructures offer better platforms than the intrinsic materials for new, specific device applications. **Read more online.**



inSTEM conference: towards a more diverse science community

The inSTEM conference (Brisbane last month) was a networking and career-development conference for people from marginalised or underrepresented groups in STEM, and their allies.

Over two days scientists connected with others from marginalised or under-represented groups, developed professional networks, built networking skills and strategies supporting personal career development, and discussed strategies to improve Australia's scientific diversity.

FLEET participation included nine delegates attending in-person and five more attending virtually. **Read more online.**

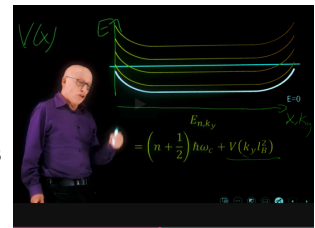


Outstanding author nomination: Congratulations to Qile Li, Monash University PhD candidate in the School of Physics and Astronomy, who was nominated for the Science Faculty's 'Outstanding Author Contribution' award for his paper on large magnetic gaps in ferromagnet-topological insulator heterostructures. [Read about the paper here.](#)



Liquid-metal podcast ep A nice podcast episode looks into manipulation of liquid gallium, with Michael Dickey (North Carolina State University) collaborating with FLEET's Xiaolin Wang and Yahua He (UOW), and Kourosh Kalantar-Zadeh and Jianbo Tang (UNSW). [Listen online.](#)

Topological quantum-matter course An impressive online Weizmann Institute course brings together the Quantum Hall effects, topological superconductors, topological insulators, and semi-metals, graphene, including twisted bi-layers, topological classification, material properties predictive techniques, experimental tools and states of topological order. [Watch the course introduction / read more.](#)



Participating organisations

FLEET is The Australian Research Council Centre of Excellence in Future Low-Energy Electronics Technologies. Read more about our [participating nodes](#) and [partners](#) online.

