



ARC CENTRE OF EXCELLENCE IN
FUTURE LOW-ENERGY
ELECTRONICS TECHNOLOGIES

FLEET News: April 2022

FLEET stands in solidarity with its participating universities, the Australian government, and learned societies around the world, in condemning the Russian attack on the people of Ukraine. Please read the **full statement from FLEET**, including ways you can help.

Michael Fuhrer
Director, FLEET



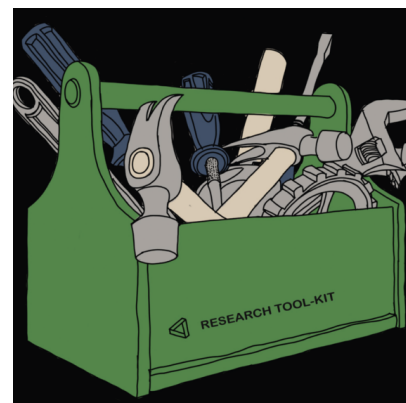
In this edition of FLEET News:

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- **Making a sandwich for lossless electronics** (Monash)
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FLEET video hack competition

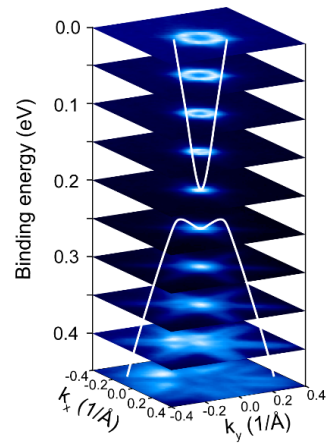
To help build members' video skills the Centre is running a competition encouraging submission of life hacks, submitted via video. We'll be sharing the results publicly afterwards.

These could be something that assists with gathering data, presentation tips, grant writing. In-person events being are being hosted by RMIT and UNSW with online participation also available.



Making a sandwich for lossless electronics

A Monash-led FLEET team sandwiching a topological insulator between two ferromagnetic insulators have provided a quantum avenue towards ultra-low energy future electronics, with the designer heterostructure becoming a large-bandgap quantum anomalous Hall insulator. Qile Li and Mark Edmonds at Monash Science led the study, working with Nikhil Medhekar (Monash Engineering) and David Cortie (UOW, ANSTO). [Read more online.](#)



Reaching academic heights in Europe: alumni profile

We talk to FLEET alumni Pavel Kolesnichenko (ex Swinburne) who is now a senior postdoctoral scientist at Heidelberg University in Germany, applying expertise gained at FLEET on 2D materials and spectroscopy, and also putting other 'soft' FLEET skills to use, such as communication. [Read more online.](#)



Congratulations to our ECR authors this month

Congratulations to the following FLEET students and ECRs who are authors in our **most recent publications**: Fei Hou, Jackson Wong, Jiong Yang, Olivia Kong, Adam O'Neill, Qile Li, Chi Xuan Tran and Matthew Rendell.

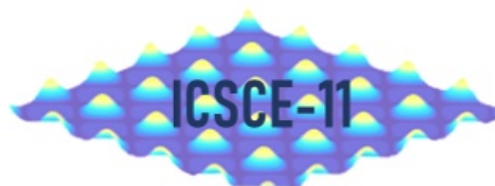


Save the date...

The **10th International Conference on Advanced Materials & Nanotechnology** will proceed as an in-person conference in Roturua, 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.



The **11th International Conference on Spontaneous Coherence of Excitons** (ICSCE-11) will be held in Burlington, Vermont, USA, 7-11 August 2022. Abstract submission is now open. See the **website** for further information.



Catch up on past talks

See the Presentations folder on the FLEET intranet for slides and videos from FLEET2021 in December. Also catch up on:

- Ehud Altman (Berkeley) **Phase transitions and critical states of monitored quantum systems**
- Michael Fuhrer (FLEET Monash) **Negative capacitance in topological transistors**
- David Snoko (Pittsburgh) **Superfluids of light**
- Michael Fuhrer (FLEET Monash) **Topological transistors**
- Ceri Brenner (ANSTO) **ANSTO-FLEET seminar on accelerator science**
- Susan Coppersmith (FLEET UNSW) **Quantum stochastic resonance**

Grants and opportunities

Quad Fellowships were announced as part of the signing of the Quad agreement between the USA, Australia, Japan and India. The Fellowships provide \$50,000 plus further support to complete post-graduate studies. Applications close 1 June 2022.

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+). Pint of Science are currently seeking volunteers or presenters to help with this year's festival.

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

Monash University is currently advertising two research positions: Research Fellow position in the Electronic Properties of Twisted 2D Semiconductors and Research Fellow - Experimental Physics. Please see the position descriptions for further information.

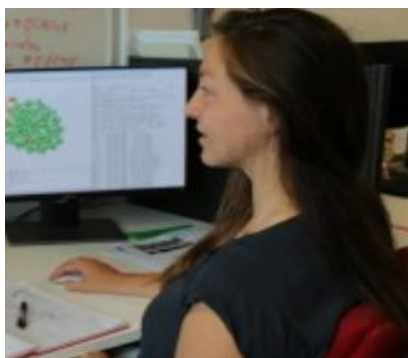
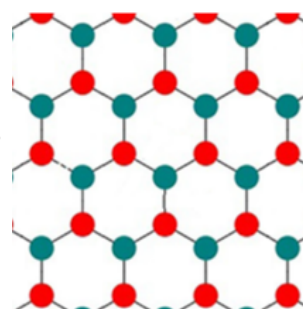
Previous news

FLEET Annual Report 2021 The latest report has been submitted to the ARC. Despite a second year of pandemic conditions and restricted research capabilities, the Centre has again reported a great year, meeting or exceeding the majority of key performance indicators. As would be expected, the ones not met were those linked with travel or outreach and out of our control. [You can read the full report online.](#)



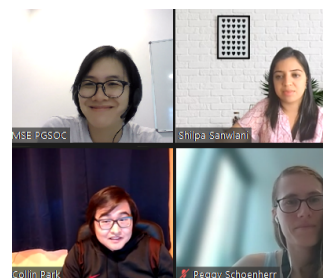
Exciting Swinburne research A rare spectroscopy technique directly quantifies the energy required to bind two excitons together, harnessing interactions between real and virtual states to switch the electronic state of an atomically-thin (2D) material. As well as improving fundamental understanding of biexciton dynamics and exotic new quantum materials, the study aids work towards biexciton-based devices and future low-energy topological electronics. [Read more online.](#)

Zigzag Xenes could be topological switching key A multi-node study led by Muhammad Nadeem at UOW confirms potential of zigzag-Xene-nanoribbons to switch future topological electronics, with a low threshold voltage required for switching between gapless and gapped edge states reducing as the width of the material decreases, without any fundamental lower limit. [Read more online.](#)



McDiarmid-FLEET collaboration A year of disrupted travel plans hasn't stopped Auckland/MacDiarmid PhD student Stephanie Lambie from successfully kick-starting a trans-Tasman collaboration with FLEET, and says a highlight has been working with inspiring women in science. [Read about Stephanie's work](#) with UNSW and other FLEET collaborators at MacDiarmid.

Career Advice An expert panel ran through issues of importance to PhD and Masters graduates at UNSW, answering the questions for ECRs towards the end of study, as they prepare to start looking for graduate positions for the first time. Organised by UNSW Materials Science and Engineering and FLEET PhD candidate Hien Nguyen, the panel included experts, including drawing on FLEET expertise and alumni, to share their employment and job-hunting experiences. [Read more online.](#)



Alumni Profile "I've gone from designing experimental techniques and establishing optical systems, to designing and delivering anti-money laundering detection solutions!" Catch up with FLEET alum Shilpa Sanwani, who is now applying skills learned running 2D system spectroscopy experiments at Swinburne University as her new role as a Senior Data Analyst in ANZ's Financial Crime Threat Management team. [Read more online.](#)

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.

