



ARC CENTRE OF EXCELLENCE IN
FUTURE LOW-ENERGY
ELECTRONICS TECHNOLOGIES

FLEET News: September 2021

I hope everyone is coping well with the local/global situation.

At FLEET we are currently planning both an online catch-up for December this year and a full 'in person' Annual Workshop for July 2022, thus meeting in person again as soon as possible.



The December meeting will allow us to get together virtually to celebrate having survived a tough year, share research and other highlights, and catch up.

This month's newsletter welcomes Tenille Ibbotson, who joins the FLEET Operations team. Also see articles on star-like materials research at Monash, surface competition at UNSW, superfluids at Swinburne, plus other news from around the Centre.

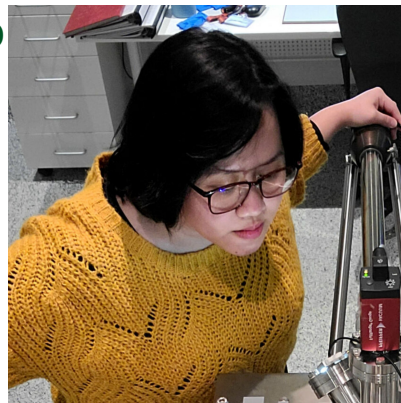
Regards,
Prof Michael Fuhrer
Director, FLEET

In this edition:

- **Large bandgap intrinsic TI** (Monash)
- **Surface elements compete** (UNSW)
- **Switching on a superfluid** (Swinburne)
- **Star-like structure generates magnetism** (Monash)
- **Meet Tenille, new FLEET EO**
- **Multiferroics conference in November**
- **Support Mitko at VYT**
- **ECRs guiding ECR training**
- **Semiconductor industry news**
- **Talks and events coming up**
- **Congratulations to our ECR authors**

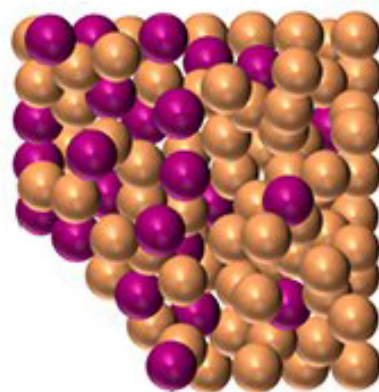
Electrons on the edge: large-bandgap intrinsic magnetic TI

An Intrinsic magnetic topological insulator with large band gap—discovered in a study led by Chi Xuan Trang and Qile Li (Monash) is a promising material platform for fabricating ultra-low-energy electronics and observing exotic quantum phenomena. [Read more online.](#)



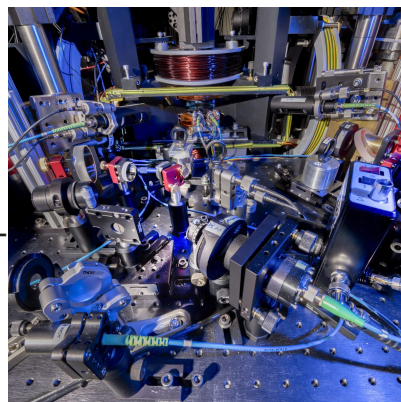
Elements in liquid metals compete to win the surface

A new study led by Mohammad Bagher Ghasemian (UNSW/CASLEO) investigates surface competition between elements as an approach for harvesting mixed-metal oxide sheets for use in electronics and optics, proposing new horizons for the production of large 2D electronic materials from the surface of liquid metals. [Read more online.](#)



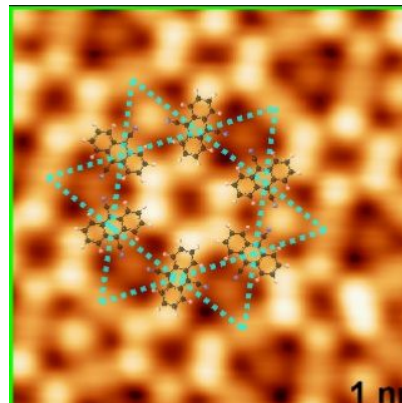
Switching on a superfluid

A new Swinburne study led by Paul Dyke examines systems transitioning from 'normal' fluid to superfluid, revealing properties of the transition associated with different dynamical processes, with a view to switching off and on future, superfluid-based technologies. [Read more online.](#)



Star attraction: magnetism generated by star-like arrangement

A new study led by Dhaneesh Kumar (Monash) demonstrated the emergence of localised magnetism due to a 2D nanomaterial's unique, star-like atomic-scale structure has potential for applications in next-generation beyond-CMOS electronics based on organic nanomaterials, where tuning of electronic interactions can lead to a vast range of new electronic and magnetic phases. [Read more online](#).



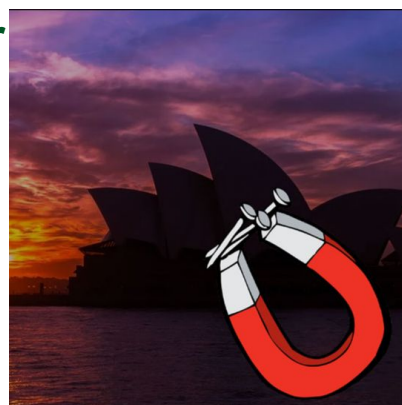
Meet Tenille, new FLEET EO

Tenille Ibbotson is FLEET's new Executive Officer, based at Monash with the Centre Operations team. Tenille will be providing expert support to FLEET projects, staff and governance functions across all seven nodes, using her experience with the Brain Function COE and management roles at Uni Melbourne and ANU.



Multiferroics conference in November

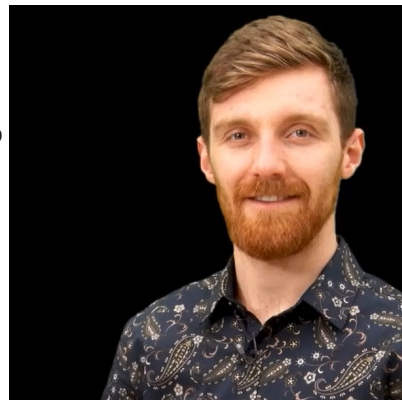
The 12th APTC Workshop on Multiferroic will host discussions of materials exhibiting more than one type of built-in order (eg, magnetism and ferroelectricity), including multiferroic domain engineering, electromagnon excitation and manipulation, artificial multiferroic heterostructures, vdW materials and topological defects such as domain walls and skyrmions in multiferroics.



FLEET's Jan Seidel (UNSW) is Chair of this conference, which will involve talks by leaders in the field. Read more and register at FLEET.org.au/multiferroics

Support Mitko at VYT

FLEET PhD student, Mitko Oldfield won the Monash University Visualise Your Thesis 2021 Competition (VYT) and will go on to represent Monash (officially) and FLEET (unofficially) at the International VYT Final on 4 October. There's a prize for 'most views' so you'd be doing Mitko a favour by **watching** and/or **sharing** his video.



ECRs guiding ECR development

FLEET student and ECR working group: Vivasha Govinden (UNSW) and Abigail Goff (RMIT) are leading a project to gauge what skills ECRs, fellows, and students would like to focus on in terms of upskilling and personal development. They hope to use this survey to assist the team in planning an ECR conference that is “for the ECRs and by the ECRs”, including sessions that are most needed to assist in career development.

Semiconductor industry news

The 2021 annual report from the **Semiconductor Industry Association** (SIA) looks at the strengths and challenges of the US semiconductor industry, following this month's **White House meeting with industry leaders**, and Intel's announcement of **two new \$20bn US-based foundries**.



Meanwhile in Australia a couple of NSW innovators have achieved record solar-panel efficiency using new materials in a start-up that's just recently expanded from their Wollongong garage. **Read ABC coverage.**

Talks and events coming up

Don't miss today's TMOS/FLEET talk by Francesca Iacopi explaining new, consistent, reliable wafer-scale graphene synthesis at UTS. Starts 11AM. **Join here.**

RESEARCH SEMINAR

Augmenting silicon technologies –
Epitaxial graphene on silicon wafer

Francesca Iacopi, UTS

Thursday 30 September 2021
11:00 AM AEST



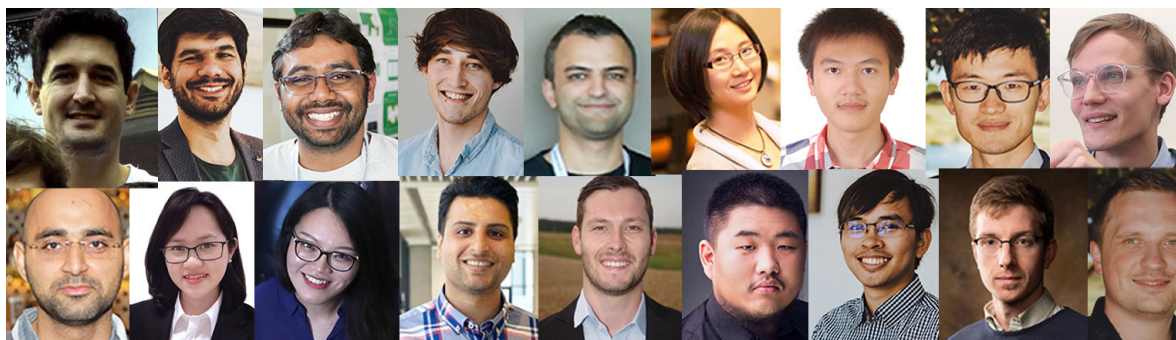
And coming up in the next month:

- **5 Oct Active bystander workshop**
- **7 Oct FLEET-Exciton Science seminar M. Klymenko, Optical response of 2D semiconductors**


More men in STEM taking on childcare/family support would reduce the inequitable impact on the careers of women in STEM. Tune in to hear best-practice, equitable parental-leave policies with DCA next Wednesday. [Register online](#).

Congratulations to our ECR authors this month

Congratulations to the following FLEET students and ECRs who are the first, second or third author in our **most recent publications**: Andrew Hogan, Aydin Keser, Dhaneesh Kumar, Oliver Paull, Ali Zavabeti, Peggy Zhang, Qile Li, Weiyao Zhao, Jack Hellerstedt, Pankaj Bhalla, Chi Xuan Trang, Daisy Wang, Mohammad Ghasemian, Matthias Wurdack, Zhanning Wang, Eliezer Estrecho, Sergei Prokhorenko, Maciej Pieczarka.



EMCR forum

What do early-and mid-career researchers need for their careers to be sustainable? Check out Science Pathways 2021: Sustainable Careers', promising thought-provoking discussions around the future of work (whether in academia, industry, or govt), 

managing work-life responsibilities, looking after our mental health, and building a more inclusive STEM sector, and more.

In person and/or online, including panel discussions, professional development, and networking. Launches 25-26 November at the University of Melbourne (and online), followed by three online-only events in early-December. [Register online](#).

IEEE: Rebooting computing and GreenCom

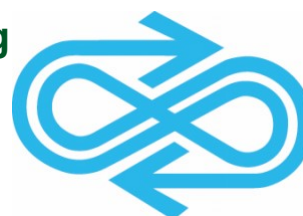
The 6th IEEE International Conference on Rebooting Computing will be held online in Nov/Dec 2021, soliciting original papers on future computing technologies of all types. More info at [ICRC.ieee.org](https://icrc.ieee.org) or see rebootingcomputing.ieee.org.



The 17th IEEE **International Conference on Green Computing and Communications** will follow soon after, in Melbourne, 6-8 December.

Bring your physics to the AIP summer meeting

Abstract submissions are now open for the Australian Institute of Physics Summer Meeting (6–9 December) at QUT in Brisbane. FLEET's Iolanda Di Bernardo (Monash) and Dongchen Qi (QUT) are encouraging all Australian physicists to consider attending to present their research. [Details online](#).



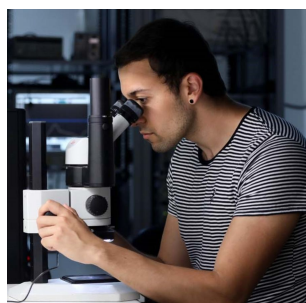
Other grants and opportunities

For outreach/development opportunities see [In2science](#) mentoring, and [CSIRO STEM Professionals in Schools](#).

Know anybody interested in an **industry internship**? [APR Interns](#) are again advertising positions.

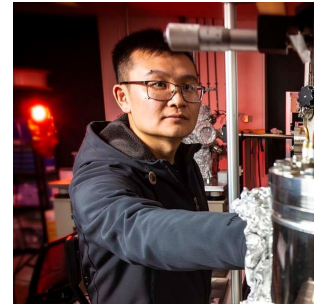
Previous news

Mixing a cocktail of topology and magnetism A review led by Semonti Bhattacharyya at Monash spotlighted heterostructures where the interplay of magnetism and topology allows exotic quantum phenomena for future low-energy electronics. [Read more online](#).



Home-grown semiconductors for faster, smaller electronics Yoni Ashlea Alava and crew at UNSW have demonstrated that growing electronic components directly onto a semiconductor block avoids messy, noisy oxidation scattering, with resulting high-mobility components ideal candidates for high-frequency, ultra-small electronic devices, quantum dots, and qubit applications. [Read more online](#).

Zhi Li: a superconducting future fellow Congratulations to FLEET Al Dr Zhi Li (UOW) who received an ARC Future Fellowship in last month's announcement. The new ARC Fellowship will support Zhi's study of iron-based high-temperature topological superconductors, based at the Institute of Superconducting and Electronic Materials (ISEM) at the University of Wollongong. [Read more online.](#)



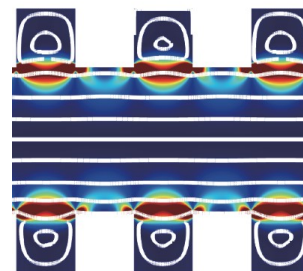
¡Felicidades! to Iolanda Di Bernardo Congratulations to FLEET Research Fellow Dr Iolanda Di Bernardo (Monash), receiving the highly prized Juan de la Cierva fellowship to fund research with Prof Amadeo Vázquez de Parga at Madrid's IMDEA Nanociencia Institute. [Read more online.](#)

Three new DECRA's at FLEET Three FLEET members received ARC DECRA Fellowships last month, funding research into superfluid turbulence, EM-controlled polaritons and twisted 2D materials. Congratulations to: Dr Matt Reeves (UQ), Dr Eli Estrecho (ANU) and Dr Qingdong Ou (Monash). [Read about the work being funded online.](#)



Where are they now? FLEET alum Paul Atkins Talk to as many people as possible about your future career, and stay open to new career directions. FLEET alum Dr Paul Atkins (ex 2D material science at RMIT) has found a thoroughly rewarding post-career outside of academia, facilitating others scientific discoveries via providing specialised equipment. [Read more online.](#)

Electrons 'flowing like honey' Electrons can flow like a fluid thicker than honey, with potential for future electronics—contrary to textbook model of a solid as a 'pinball machine', with electrons bouncing around between atoms in the crystal lattice. APS Physics has published a nice article about the new paper from Aydin Keser, Daisy Wang and the team at UNSW, with Shaffique Adam at Yale-NUS College. [Read the article.](#)



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.



Australian Government
Australian Research Council



Copyright © 2021 FLEET Centre, All rights reserved.

You have been sent this email because we believe FLEET's news will be of interest. If we were wrong, our apologies! Please make use of the unsubscribe button below.

Our mailing address is:

FLEET Centre
c/-School of Physics & Astronomy, Monash University
Clayton, Vic 3800
Australia

[Add us to your address book](#)

Want to change how you receive these emails?

You can [update your preferences](#) or [unsubscribe from this list](#).

