

### FLEET News: August 2023

See below a wealth of science stories ranging from liquid metals to nanoscale earthquakes to topological gardening. Plus another FLEET alum profile, and a celebration of FLEET's mighty outreach volunteers.

Michael Fuhrer  
Director, FLEET




---

#### In this edition of FLEET News:

- [Liquid metals feature](#) (UNSW, RMIT, MacDiarmid)
- [Listening to nanoscale earthquakes](#) (UNSW)
- [Topological gardening' yields unexpected spin transport](#) (Monash)
- [Hareem Khan alum profile](#)
- [Condensed matter in the news](#)
- [FLEET events coming up](#)
- [Industry internships for PhDs](#)
- [Outreach efforts in August](#)
- [Jobs board](#)
- [FLEET's ECRs publishing this month](#)
- [More talks online](#)

---

## Liquid metals feature

"There's something compelling, even a little supernatural, about a metal in the liquid state." A nice feature on liquid metal catalysts at *Chemistry World* this month brought together work from Torben Daeneke (RMIT), Kourosh Kalantar-zadeh (Sydney and UNSW) and Nicola Gaston (MacDiarmid Institute).

[Read the article online.](#)



---

## Listening to nanoscale earthquakes

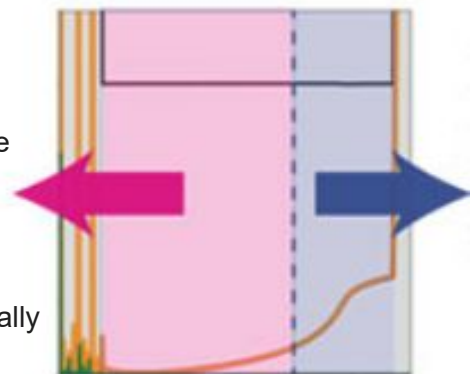
A recent UNSW-led paper in Nature Communications presents an exciting new way to listen to ‘the crackling’ noise of atoms shifting at nanoscale when materials are deformed, providing potential improved methods for discontinuities in novel, new materials, such as those proposed for future domain-wall electronics. For more about the study led by Cam Phu Nguyen, [read the story online](#).



---

## Topological gardening’ to achieve unexpected spin transport

‘Trimming’ the edge-states of a topological insulator yields a new class of material featuring unconventional ‘two way’ edge transport in a new theoretical study led by Yuefeng Yin at Monash. The new material, a topological crystalline insulator, forms a promising addition to the topological materials family, significantly broadening the scope of materials with topologically nontrivial properties. [Read more online](#).



---

## Hareem Khan FLEET alum

Meet FLEET alum Hareem Khan, previously at RMIT and now a postdoc at CSIRO's Solar Technologies group, where she is applying materials skills learned at FLEET/RMIT to improve solar technologies. [Read Hareem's profile online](#).



---

## Capitalising on condensed matter in the news

On the back of high enthusiasm for condensed-matter physics and quantum materials in general media and public spheres, FLEET's Michael Fuhrer has penned an article about LK-99 for *The Conversation*: [Hopes fade for ‘room temperature superconductor’ LK-99, but quantum zero-resistance research continues](#).



---

## FLEET events coming up

**Seminar: New pathways to research commercialisation** (zoom, 5 Sept) Hear from Australian tech investors about two exciting new ways for researchers in deep tech to become

entrepreneurs and commercialise their research. [Sign up online.](#)

**inSTEM 2023** (RMIT, 19-21 Sept) is a career-development conference for underrepresented groups in STEM and their allies, as well as facilitated networking with delegates from 10 other partner COEs. Read more about [inSTEM 2022.](#)



**A FLEET ECR workshop** (UNSW 19-20 Oct) will help develop our peoples' transferable skills in article writing, profile building, job hunting, and looking after mental health.

**Meet FLEET** (UNSW, 20 Oct) will be an event where key industry, venture-capital and government contacts can meet with FLEET researchers. A great opportunity for our researchers to promote their work, and to establish connections with potential investors and end-users.

**FLEET legacy workshop** (Gold Coast, 29 Nov to 1 Dec) Our final Centre-wide event will shape how we communicate FLEET's impact to the research community and beyond, and offer a platform for future collaboration conversations, networking, and idea exchange.

---

## Industry internships opportunity

A new route is now open to valuable 'on the factory floor' industry experience for FLEET PhD and Masters students via three-month industry internship placements. See [FLEET.org.au/internships](https://fleet.org.au/internships) for more information about the program, which will allow FLEET ECRs to apply their HDR training to an industry challenge, increase employability, and fast-track their careers.

---

## Outreach bonanza

August is always a busy month in science outreach, and FLEET volunteers (and coordinator Jason Major) have been kept busy engaging with students and public at **university open days, the Sydney Science Trail, Three Minute Thesis and the National Science Quiz**, reaching over 3000 students and public in the last month. Volunteers are too numerous to list, but thank you to everyone who has helped make FLEET science outreach a success in August!



---

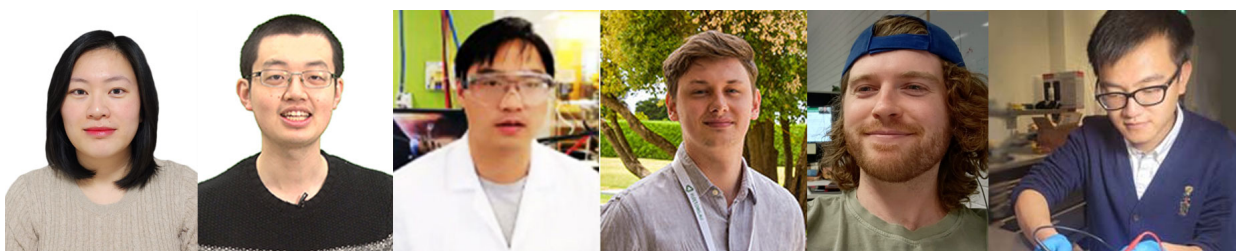
## Jobs board

The FLEET “jobs board” at [FLEET.org.au/jobs-board](https://fleet.org.au/jobs-board) is a useful resource for people looking for future positions. If you know of any positions of interest, let us know and we'll add them. Group leaders, we're happy to list your new positions here too.

---

## FLEET ECRs publishing in August

Congratulations to our early-career researchers who were authors on papers published this month: Cam Phu Nguyen, Chutian Wang, Guangsai Yang, Jack Muir, Lina Sang, Mitch Conway and Qile Li. See more in [FLEET publications](#).



---

## Other events

**Nanomagnet physics tour** FLEET AI Karen Livesey's AIP Women in Physics tour reaches Our Nation's Capital on 11 September (5.30pm at the Kambri Cultural Centre); tickets are free, [book via Facebook](#).

**The 2023 AIP Physics in Industry Day: The Future of Semiconductors** will be held in Sydney Thursday, 2 November 2023.



**The 1st International Conference in Quantum Energy** in Melbourne 4-6 December 2023 will examine the role of quantum technologies in future energy challenges and opportunities. [ICQE.com.au](https://icqe.com.au) / presenter registration 31 August / early bird 4 September.

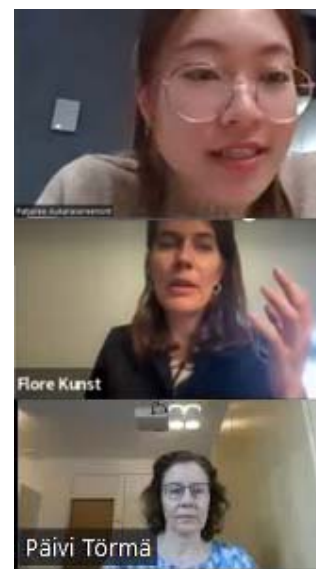
---

---

## Catch up on past talks

FLEET seminars and talks are available to catch up on YouTube:

- Flore Kunst (Max Planck) **Exceptional non-Hermitian topology**
- Patjaree Aukarasereenont (RMIT) **Liquid metal platforms for synthesis of 2D materials**
- Karen Livesey (Newcastle) **Analytic theories for magnetic skyrmions**
- Päivi Törmä (Aalto Uni) **Quantum Geometry in flat-band superconductivity, BEC, light-matter interactions & nanophotonics**



---

## Grants and opportunities

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+). Closes 1 Sept.

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

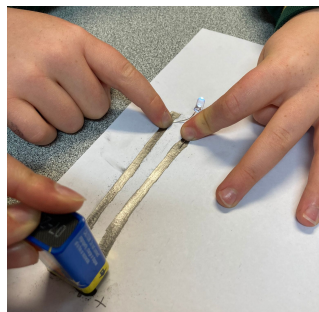
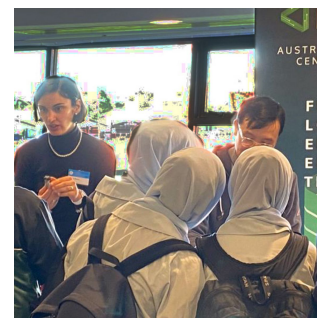
---

## Previous news

**Neuromorphic chip** A new neuromorphic chip developed by Sumeet Walia, Torben Daeneke and the team at RMIT uses brain-like analogue processing to process quickly and efficiently using minimal energy, with potential applications in bionic vision, autonomous operations in dangerous environments, shelf-life assessment of food, advanced forensics, and with the ability to make rapid, complex decisions such as in self-driving cars. **Read more online.**



**Careers expo for future scientists** "With STEM you can..." Tiziana Musso, Zhi Li and Kath Tajer (FLEET/UNSW) joined outreach coordinator Jason Major at the CSIRO careers expo in Sydney last month engaging future scientists by demonstrating hands-on magnetic and graphene demonstrations, van-der-Graff generator, jumping rings and graphite circuits.



### **Quantum and electricity at Ashburton**

**Primary** FLEET volunteers Kenneth Choo/Enamul Haque (Monash) and Caiden Parker (RMIT) were teaching quantum/electricity at Ashburton Primary last month – coaching the kids through the thought processes from Bohr model atoms (electron in a precise position) to electron clouds and 'wavy' electrons. FLEET has significantly expanded our Forces and Energy teacher resource examining energy from the physics of Newton to Einstein, to the wavy behaviour of sub-atomic particles such as electrons. [Read more online.](#)

**Universities report** A recent Australian universities report identifies the challenge of increasingly many jobs requiring an degree, and the lack of equity in uni access for outer-suburbs and regional populations. Recommendations include establishing regional uni hubs, scrapping the 50% pass rule that has had a disproportionately negative impact on students from poor backgrounds and from the regions, and First Nations students funding. [Read the report 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.



