

**FLEET News: June 2022**

Greetings from Sydney where I'm attending my first international conference in more than two years (see ICPS below), and looking forward to seeing all the FLEETers in person next week at our annual workshop in Wollongong.

It is energizing to see fellow scientists in person, and the flow of new ideas is palpable! Though it can also be a bit daunting after two years of social distance.

Michael Fuhrer  
 Director, FLEET




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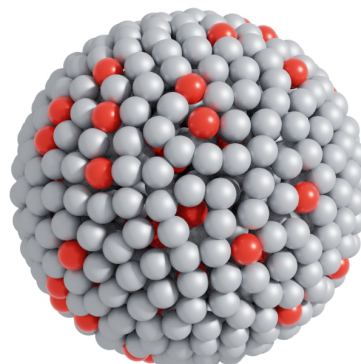
**In this edition of FLEET News:**

- **Liquid platinum at room temperature** (UNSW, RMIT)
- **Majorana fermion in topological superconductors** (UOW, UNSW, RMIT)
- **FLEET2022 Annual Workshop** (UOW)
- **FLEET ICPS satellite meeting**
- **FLEET seminar, in-person** (Monash)
- **Semiconductor industry briefings**
- **Equity & diversity / funding for iSTEM**
- **Sumeet Walia/ATSE boosting women in STEM** (RMIT)
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- **FLEET rural outreach continues**
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**Liquid platinum at room temperature**

Liquid platinum study provides cheaper, more-efficient, reliable chemical reactions – a pathway to dramatic emissions reductions. The cool new study combines researchers from the ARC Centre of Excellence in Exciton Science and FLEET at UNSW and RMIT. [Read more online.](#)



## Seeking the Majorana fermion in topological superconductors

Past Issues

PhD candidate Lina Sang at UOW led a new FLEET collaboration with RMIT, UNSW and Tsinghua tracking the hunt for the elusive Majorana fermion (or 'angel particle'), which is both matter and antimatter, in iron-based superconductors. Majorana fermions hold promise for zero-resistance paths in ultra-low energy electronics, while Majorana zero-energy modes in topological superconductors make those materials the main candidate materials for realising topological quantum computing.



[Read more online.](#)

## FLEET2022 Annual Workshop

FLEET2022 at the University of Wollongong (next week, 4-8 July) will be our first in-person workshop in 2½ years, and we're hugely excited to be seeing members and families, and many visiting partners again.



## FLEET ICPS satellite meeting

In conjunction with ICPS in Sydney, and prior to the Wollongong workshop, FLEET is hosting a satellite symposium on **Friday, 1 July** in Austinmer south of Sydney, and will include talks by international experts including Allan MacDonald and Elaine Li from the University of Texas, Austin.



## FLEET seminar: Nanophotonics in TMDCs at Monash

Around 30 FLEET members and affiliates gathered at Monash this month to hear Luca Sortino (visiting from Ludwig-Maximilians-Universität München) present our first in-person FLEET seminar in a long while. We took the opportunity to share lunch and catch up for some long-overdue chats over coffee and sandwiches.



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## Semiconductor industry briefings

Recordings are available from this month's Semiconductor Industry Association (SIA) briefings on work towards the semiconductor industry 'Decadal Plan' from DARPA/SRC JUMP programs.

- **Episode 1** covered compute/memory devices, edge computing, and tracking data growth towards energy consumption and carbon footprint.
- **Episode 2** included semiconductor hardware, THz communications & sensing, heterogeneous integration, THz/mm transistors in wireless systems (thermal bottlenecks), new materials and approaches in memory/storage, and cross-layer design.

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## Equity & diversity resources/networking

**inSTEM** (20-21 July) is a networking and career-development conference for people from marginalised or underrepresented groups in STEM, and their allies. Connect with other scientists from marginalised or underrepresented groups. Develop your professional networks, build networking skills and strategies supporting personal career development. Discuss strategies to improve Australia's scientific diversity, increasing access, retention and success for diverse groups. inSTEM is an initiative of ten ARC Centres of Excellence, with FLEET a co-sponsor of the event. Online attendance is also possible.

Grants totalling \$5000 have been approved to support members attending FLEET's **annual workshop**. FLEET funding for **writeup scholarships**, introduced as a response to feedback regarding pandemic challenges in 2020, are ongoing.

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## Sumeet Walia/ATSE group boosting women in STEM

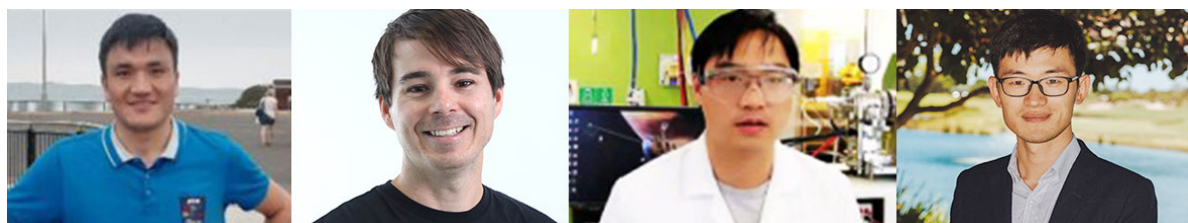
FLEET AI Sumeet Walia at RMIT joins a group of 16 Australian Academy of Technology and Engineering (ATSE) STEM champions from across industry and academia to guide 500 undergraduate and postgraduate scholarships over 7 years to women in science. [Read more about the new group online.](#)



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## ECR authors in June

Congratulations to our early-career researchers who were first, second or third authors on papers published this month: Abdulhakim Bake, Daniel Sando, Guangsai Yang and Weiyao



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## FLEET rural outreach

FLEET dispatched another outreach expedition to Victoria's west last week, with outreach coordinator Jason Major and COO Tich-Lam Nguyen visiting Horsham College year-7 students as they pilot-tested FLEET's Forces and Energy Workshop. The budding scientists built catapults and balloon rockets to explore Newton's 2nd and 3rd laws and learned a bit about FLEET's research to develop low-energy electronics.



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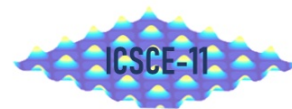
## Semiconductor conference

**The International Conference on the Physics of Semiconductors** (ICPS) this week in Sydney has covered electronic, structural, optical, magnetic and transport properties of materials. FLEET is a sponsor of the ICPS, with Director Michael Fuhrer, AI Sue Coppersmith, PI Allan MacDonald and Centre advisor Francois Peeters all involved on committees or as plenary/invited speakers, along with other Centre speakers.



## Conferences on the calendar

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.



**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

The **10th International Conference on Advanced Materials & Nanotechnology** (AMN10) 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.



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## Catch up on past talks

Catch up on past talks on YouTube:

- Lu Li (Michigan) [Quantum Oscillations of Electrical Resistivity in an Insulator](#)
- Harley Scammell (UNSW) [Exciton condensation in bilayer graphene](#)
- Ana Maria Rey (JILA, U. Colorado) [Optical lattice clocks](#)
- Mitko Oldfield (Monash) [Pint of Science talk](#)

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## Grants and opportunities

**Veski Victoria** Leadership Prize and Fellowships are open for nominations, deadline 18 July. Fellowships provide up to \$18,000 to undertake a short-term overseas study mission to develop a commercial idea, or pursue training or career development opportunities.

**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.

For example, a new quantum researcher role in Canberra would pursue development of room-temperature quantum computing using synthetic diamonds at [Quantum Brilliance](#).

**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+).

**EMBL Australia short-term travel grant** applications are due 30 June (tomorrow).

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

Know anyone interested in an **industry internship**? See active positions at [APR Interns](#).

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## Previous news

**FLEET's 2021 Annual Report has been approved** by the ARC, with particular praise for FLEET's new translation program, the expansion of Women in FLEET Fellowships to other, diverse groups under-represented in STEM (Diversity in FLEET), the planned ECR workshop running in conjunction with FLEET2022, and the new, online mentorship-tracking system.



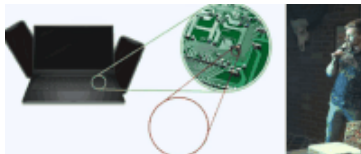


**Alumni report** Elizabeth Marcellina, previously at UNSW, tells us how her multidisciplinary studies at FLEET, and always thinking about 'the big picture', have helped set her up for further studies at Nanyang Technological University (NTU) in Singapore.

[Read more online.](#)

**Melbourne Knowledge Week** Around 300 visitors coming thru the FLEET stall at Melbourne Knowledge Week last month talked to FLEET volunteers about role of physics and material science in addressing computing-energy issues + other challenges.

[Check out great pics online.](#)



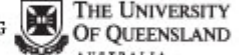
**Mitko Pint of Science** FLEET PhD

student Mitko Oldfield (Monash) gave a very entertaining and clear explanation of the role of exciton-polaritons in future superfluid-based electronics, for the national Pint of Science event last month. [Check out the video on youtube.](#)

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## 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**