

FLEET News: September 2019

We're very pleased this month to announce a new partnership with NZ's MacDiarmid Institute.

See later in this newsletter for news about the new partnership, as well as new funding for working with MacDiarmid, or for other new strategic research directions.

There's also 'impossibly cool' research from Monash, science outreach and an award for PhD student Stuart Burns at UNSW, and other news from around the Centre.

Regards,

Dr Tich-Lam Nguyen
 Chief Operating Officer, FLEET



Catch up on previous editions of FLEET News

In this edition:

New partnership, funding opportunities
 Impossibly cool temperatures explained
 UNSW science-outreach
 Congratulations Stuart Burns
 Monash Energy conference
 Gutsy research at UNSW

Help us fill positions
 Spontaneous coherence: summer school & ICSCE10
 Gordon Godfrey workshop, AIP
 Australian physics profiled
 Previous news
 Events coming up

New trans-Tasman partnership, and new funding

A new trans-Tasman FLEET-MacDiarmid partnership will advance shared research aims towards low-energy electronics via novel materials and devices. [Read about the agreement, and meet new FLEET PIs Nicola Gaston and Justin Hodgkiss online.](#)

The partnership will also extend to education, outreach and public engagement, as well as sharing best practice on equity and diversity in STEM.

A new fund is available to FLEET members to support outgoing travel to collaborate with MacDiarmid investigators, particularly intended to support PhD/postdocs in the region of 1-3 months. This funding has been matched by MacDiarmid for their investigators.

New, strategic seed funding is also available for new research initiatives contributing to FLEET's mission to develop low-energy electronics.



- Bring new research ideas into FLEET, enhancing existing Themes or seeding new Themes
- Bring new investigators into FLEET, or involve existing AIs/PIs more closely with FLEET
- Improve diversity of FLEET's network.

Impossibly cool temperatures explained

Negative absolute temperatures? Isn't that *impossibly cool*?

Shaun Johnstone (Monash) explains the counter-intuitive world of negative temperatures, following on from the recent vortex research at Monash and UQ (see FLEET News in July). Watch the explanation [online](#), and feel free to share with other physics enthusiasts.



Cecilia captures science-outreach efforts

There's been a lot of science outreach happening at FLEET-UNSW over the last month, as captured in an entertaining account by node coordinator Cecilia Bloise. [Read online about a mammoth outreach effort](#) that has included Sydney Science Week, UNSW Open Day, and work on a new card game celebrating the international year of the periodic table.



Congratulations Stuart Burns

Congratulations to FLEET PhD student Stuart Burns, from Nagy's group at UNSW, who submitted his PhD thesis this month, and whose hard work was rewarded by a rare UNSW scholarship to continue research while his thesis is being reviewed. [Read more about Stuart's PhD research into ferroelectrics online](#).



Tich-Lam provides endless energy at Monash Conference

The inaugural Monash Energy Conference (co-sponsored by FLEET) hosted two days of talks on energy topics from solar generation and novel materials to better batteries and grid innovation. For FLEET COO Tich-Lam Nguyen it was an opportunity to introduce an energy-engaged audience to the energy demands of computing, and the need for a low-energy alternative, beyond CMOS.



Gutsy effort: study of intestinal gases at UNSW

Ingestible capsule study at UNSW, led by FLEET's own Kourosh Kalantar-Zadeh, lifts the lid on gut gases and shows their importance for human health. [Read more about the study online](#).

Kourosh's group at UNSW hosted Australia's Chief Scientist this month, seen here discussing 'liquid metal electronics' with Kourosh.



Help us fill positions at FLEET

Are there talented people in your network looking for postdoc positions in physics? How about prospective Honours or PhD students?

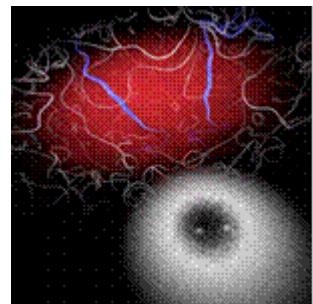
FLEET has current postdoc opportunities in both experimental and theoretical physics, and we are almost continuously looking for high-quality PhD students to advance Centre research.

If you'd like to help with this search, you can refer people to [FLEET.org.au/jobs](#), or [share FLEET's search via LinkedIn](#) (this is really easy - one click and it's done). Your LinkedIn network might be our ideal target audience.

Spontaneous coherence & collective quantum phenomena

How do quantum systems reach equilibrium, and what happens if they don't?

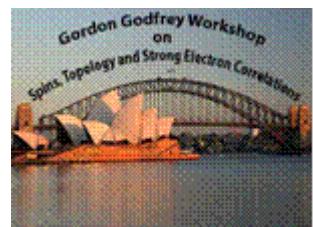
Summer School 13-24 January 2020 This year's Canberra Physics Summer School will explore Bose-Einstein condensates, superfluids, excitons, and other spontaneous collective quantum phenomena at the ANU, targeting Australian-NZ postgrads, senior undergrads and ECRs.



ICSCS10 Conference 28-31 January in Melbourne Poster submissions are still open for the 10th International Conference on Spontaneous Coherence in Excitonic Systems in Melbourne at the end of January. [meet the speakers](#) | [register!](#)

Workshop season: Gordon Godfrey, AIP summer meeting

Join us at the **Gordon Godfrey workshop (UNSW 25-29 November)** to discuss spin/pseudospin and correlations in low dimensional systems and nanostructures, topological physics and materials, phase transitions, superconductivity and Bose condensation, and correlations in metal oxides. [See more information online](#).



Abstract submissions extended to 2 October for 2019 API Summer meeting (RMIT Melbourne). Get your work out in front of 800 physicists from around Australia, including professional scientists, academics, post-doctoral researchers and PhD students. FLEET is co-sponsoring this event. [See more information online](#).

Australian physics profiled at Asia-Pacific society

Physics research at two FLEET nodes has been profiled in this month's Asia-Pacific Physics bulletin, including superconductivity and novel materials at the Institute for Superconducting and Electronic Materials (ISEM) at the [University of Wollongong](#), and FLEET and other ARC Centres at [RMIT](#).



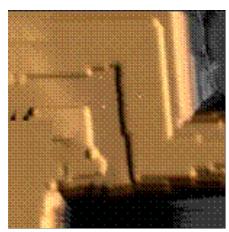
Previous news

Lindau 2019 recap Three FLEET ECRs were fortunate to attend the 69th Nobel laureate meeting in Lindau, Germany, forming an impressive 30% of Australia's ten-person delegation. [Read their report online](#).



FLEET Al Yuerui (Larry) Lu (ANU) has been named a Heart Foundation Future Leader Fellow, recognising the innovation and value of his studies of high-throughput 3D microscopy for cardiovascular imaging. [Read more online](#).

FLEET's outreach officer Dr Dianne Ruka won an Award for Exceptional Service to the Faculty of Science at Monash University. Dianne leads education, training and science-outreach for FLEET across all seven collaborating universities. [Read more online](#).



A UOW/Monash collaboration found first evidence of a new phase of matter, predicted in the 1960s: the excitonic insulator. The study provides a novel strategy to search for more excitonic insulators, potentially capable of carrying exciton superfluids. [Read more online](#). Or [read the paper](#).

FLEET is introducing Year 10s to future electronics and quantum science, covering semiconductors and binary computing, Moore's Law, quantum science, superfluids, cold-atom physics and topological materials, with FLEET members pitching in to write and deliver lessons. [Read more online](#).



A Monash study led by FLEET affiliate Jimmy Kotsakidis with Michael Fuhrer demonstrates that widely-studied monolayer TMDs must be kept out of light to maintain electronic, and optical properties. [Read more about the study online](#). Or [read the paper](#).

Events coming up

- **Integrated quantum photonics seminar (Milos Toth) 8 Oct, UNSW**
- **Future electronics seminar (Sumeet Walia) 18 Oct, UNSW**
- **Gordon Godfrey Workshop 25-29 Nov, UNSW**
- **Cavity QED seminar (Allan MacDonald) 2 Dec, Monash**
- **ANSTO User Meeting 2-3 Dec, Macquarie University NSW**
- **AIP Summer Meeting 3-6 Dec, RMIT**
- **FLEET Annual Workshop 8-11 Dec, Lorne**
- **Canberra Summer school 13-24 Jan, ANU**
- **ICSC10 28-31 Jan, Melbourne**

Participating organisations

FLEET is: the Australian Research Council Centre of Excellence in Future Low-Energy Electronics Technologies.

Participating nodes are: the Australian National University, Monash University, RMIT University, Swinburne University of Technology, the University of New South Wales, the University of Queensland and the University of Wollongong.

