

FLEET News September 2018

As Deputy Director, I'm pleased to take the reins for this September edition of the FLEET newsletter while Centre Director Michael Fuhrer takes a well-deserved family holiday.

We are excited to announce two new research partners this month. See below for an introduction to the Beijing Computational Science Research Center and Wroclaw University of Science and Technology (Poland).

We also have research news from around the Centre: quantum anomalies at Swinburne, ferroelectric switching at Monash, electron interactions at NUS, large-scale piezoelectric materials at RMIT, as well as a report on last week's live-streamed seminar on negative mass from UQ. We also profile Eli Estrecho from the ANU.

Finally, warm congratulations to Centre members Hong Liu and Weizhe Liu whose new baby Max is the first official double-FLEET baby!

Regards,

Alex Hamilton

Deputy Director, ARC Centre of Excellence in Future Low-Energy Electronics Technologies
Leader, UNSW node



Professor Alex Hamilton

Catch up on previous editions of FLEET News

In this edition:

<ul style="list-style-type: none"> • Welcome Max (Monash-UNSW collaboration output) • Quantum anomaly in 2D Fermi gas (Swinburne) • Building new partnerships (Beijing, Wroclaw) • Ferroelectric switching (Monash) • Profile Eli Estrecho (ANU) • Electron interaction effects (NUS) 	<ul style="list-style-type: none"> • Large-scale piezoelectric materials (RMIT) • Agent of Change campaign (Monash) • Negative mass: Live-streamed FLEET colloquium (UQ) • Other news from around the Centre • Events in August • Prizes and opportunities
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Welcome Max

Congratulations to FLEET PhD Hong Liu (UNSW) and Research Fellow Weizhe Liu (Monash) whose new baby Max Liu is officially the first double-FLEET baby (patent pending).

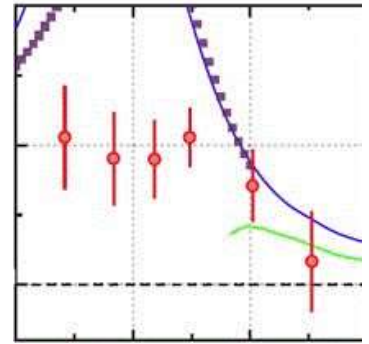
Weizhe studies the transport properties of laser-trapped cold atom clouds, while **Hong** is exploring spin-orbit coupling and interaction effect in topological materials to understand the criteria for protection against dissipation.



Quantum anomaly found in 2D Fermi gas: Cosmos magazine

Scaling symmetry in an ultracold 2D Fermi gas breaks down with strong interactions between particles: a quantum anomaly caused by strongly interacting particles. Chris Vale led this study at Swinburne University of Technology, which features in this month's Cosmos magazine.

(Also on [FLEET website](#)).



Building new partnerships

We are extremely pleased to announce two new FLEET partners: The Beijing Computational Science Research Center (CSRC) and Wroclaw University of Science and Technology have joined the 13 other leading Australian and international science organisations partnering with FLEET.

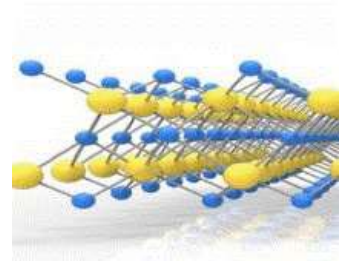
[Read more online](#) and meet our two new Partner Investigators Hai-Qing Lin (CSRC) and Grzegorz Sęk (pictured, Wroclaw).



Ferroelectric switching

Ferroelectric switching in van-der-Waals materials is a potential route for 'beyond CMOS' electronics and ultra-fast optoelectronics. FLEET's Changxi Zheng led this collaboration between Monash University and Chongqing University (China).

[Read more online](#).



Meet FLEET's Eli Estrecho

FLEET's Eli Estrecho recently finished his PhD, and is now a postdoctoral researcher, working with Elena Ostrovskaya at the ANU.

We asked Eli some questions about his research, how he got into physics, and about the thrill of fundamental discoveries that makes him so passionate about his work.

[Read more online](#).



Teasing out electron interaction effects at NUS

FLEET AI Shaffique Adam and colleagues at the National University of Singapore have answered long-standing questions regarding the Fermi velocity in graphene varying on different substrates. [Read more](#).

Shaffique studies Dirac systems at Yale-NUS, investigating electronic transport and other properties of novel Dirac semimetals.



Large-scale piezoelectric materials on tap at RMIT

New opportunities for ultra-sensitive motion detectors will come from the first large-scale piezoelectric material deposition technique: developed by FLEET crew at RMIT.

[Read more online.](#)



Michael Fuhrer, Agent of Change

In the near future the energy being used in computing is going to become unsustainable..."I realised I could change this"

Michael Fuhrer talks ICT energy and atomically-thin materials in Monash University's Agent of Change campaign.

[Watch online.](#)



Present at international 2D materials conference

Registration is open for the 4th International Conference on Two-Dimensional Materials and Technologies! Visit the website for information on how to register, accommodation options and prices. There are limited number of discounted tickets for ANN members from interstate so be quick to secure them. We are still accepting abstracts for poster presentations.



- FLEET.org.au/ICON2Dmat
- Melbourne, Victoria
- 10-13 December 2018
- Early bird registration closes Friday 5 October
- ICON2DMat young scientist awards - \$1000 cash prize
- Special editorial session with editors from high-impact journals

Negative mass: Live-streamed FLEET colloquium

FLEET's second live-streamed colloquium featured UQ's David Colas discussing negative masses in spin-orbit coupled Bose Einstein Condensates (BECs) and had members and affiliates dialling in from every node.



News from around the Centre



Adding new spin to the hole story>>> FLEET researchers at UNSW demonstrate an entirely new mechanism for electrically controlling holes' spin in a quantum well.

[Read more online.](#)



<<<Twisting condensates: Outstanding problem in exciton-polariton physics resolved using exceptional points at ANU, opening exciting future research directions in the field. [Read more online.](#)



New materials inspired by nature>>> Monash study develops self-assembling carbon-based materials that could be key to new photovoltaic and catalysis technologies.

[Read more online.](#)

[More news](#)

Events coming up in October

4-5 October 26th International Conference on Advanced Nanotechnology, Moscow

5 October FLEET seminar Wen-Xin Tang (Chongqing University), Monash University

8 October Graphene 2018 conference, Melbourne

9 October Women in Science community consultation, online forum

10 October STA members workshop, Brisbane

11 October Science Meets Business, Brisbane

11 October [Physics in the Pub](#), Brisbane

11 October AIP tour and briefing, RMIT University

15 October Women in Science community consultation, Sydney

17 October Got PhD what's next? PhD training at UNSW

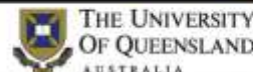
25 October Women in Science community consultation, Brisbane

Coming up in November: RMIT COEs Hub opening, FLEET workshop, ICON2DMat

PHYSICS IN THE PUB: BRISBANE
Superconductors, superheroes and a quantum electronic future
Presenters will each have eight minutes to entertain you with stand up, a poem, a song or just a damn good science talk.

Thursday 7 October 2018
6-8PM
Barbara
105/38 Warner St, Fortitude Valley
<https://www.facebook.com/events/280795412504827/>

Meet up on Science



Prizes and opportunities



The **Melbourne Centre of Nanofabrication** and ANFF Victoria are seeking Masters or PhD interns to be partnered with industry clients to work on 2-6 month internship projects.



Australian Nanotechnology Network (ANN) funding for members to travel to Australian National Fabrication Facility nodes. Open for postgraduate nanotech students and ECRs currently studying/working in Australia who are members of ANN

Science meets Business in Brisbane 11 Oct will provide a chance to mix with science and industry leaders.

Encourage your peers! Most people who nominate for a prize say they did it after encouragement from peers, colleagues and supervisors. Consider whether your own work could be nominated too!

A number of FLEET research fellowships are opening soon.

Participating organisations

FLEET's 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.



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

[Catch up on previous editions of FLEET News](#)

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