

## FLEET News April 2019

We welcome two new FLEET members this month: read on below to meet Dmitry Efimkin and Dongchen Qi.

Congratulations to FLEET's Sam Bladwell (UNSW) who won the NSW Famelab semifinal.

This month's newsletter also includes a collaborative review of ferromagnetism – plus notes on Australian science policy coming up to the election, recent ERA results, and the major new Australian plan to improve equity in STEM.

Regards



### Michael Fuhrer

Director

ARC Centre of Excellence in Future Low-Energy Electronics Technologies

*Catch up on previous editions of FLEET News*

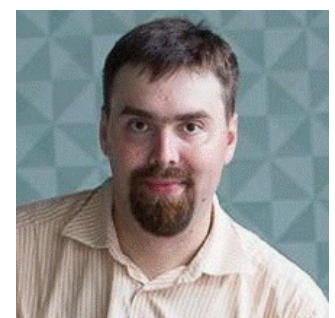
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## New FLEET investigators

Welcome to two new Associate Investigators, officially joining FLEET this month:

**Dr Dmitry Efimkin** (right, Monash University) specialises in novel materials such as Dirac materials, graphene and topological insulators, and optical phenomena in solids. He will work with FLEET CIs Michael Fuhrer, Meera Parish, and Nikhil Medhekar, studying optical and collective phenomena in novel 2D materials, and correlations and transport in bilayer systems, including electron-hole condensation and the Coulomb drag effect.



**Dr Dongchen Qi** is an ARC Future Fellow at Queensland University of Technology, seeking to develop high-performance diamond surface electronics. Within FLEET, he works with CIs Bao and Fuhrer in research theme 2, constructing electron-hole bilayers using diamond–2D oxide heterostructures to explore excitonic transport.

## Famelab success

Congratulations to FLEET's Sam Bladwell (right, UNSW), who won the NSW semi-final of Famelab, talking about study of electron spin, and will now compete in the finals in Perth on 8 May.

Topological physics has done particularly well in this year's Famelab, with FLEET associates Semonti Bhattacharyya and Antonija Grubisic-Cabo also qualifying for the Victorian semi-finals.

Watch their talks online.



## FLEET's 2nd annual report

We've recently completed FLEET's 2nd (2018) Annual Report, telling the story of the Centre's research, equity initiatives and outreach activities over the last year.

Please check it out online, and feel free to share digitally, via [FLEET.org.au/annual-reports](https://fleet.org.au/annual-reports)



## Science policy

With the Australian federal election imminent, FLEET has recently joined with Science and Technology Australia in a call from 70 different STEM organisations, asking political parties for:

- Retention of Science as a Cabinet ministry
- Increased research funding (a minimum of 3% of GDP)
- Action on reviews, inquiries, reports and roadmaps
- Clear details on parties' STEM policy
- More STEM professionals speaking about their science to public and politicians.

Read politicians' pre-election pitch at the recent STA Forum.

## Excellence in Research in Australia: ERA results

FLEET's member universities performed extremely well in recently announced ERA results, looking at the fields of research in which the Centre is active.

The ARC's audit found that:

- In Physics, every Centre node ranked in the highest ranking
- In Engineering, all nodes ranked above (or well above) world standard
- In Materials engineering, five nodes ranked in the highest ranking
- In Technology, five of seven nodes ranked above (or well above) world standard
- Comparing results with 2015, three nodes improved their Physics and/or Technology ranking.

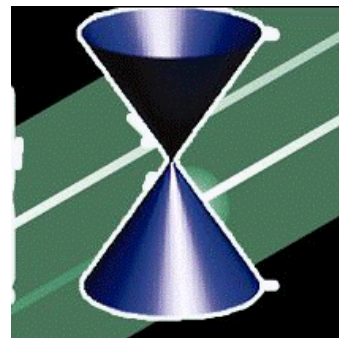


Read the full report online.

## Ferromagnetism reviewed

A large, collaborative FLEET study reviews recent progress in 2D ferromagnetism, and predicts new, possible 2D ferromagnetic materials. The study, led by FLEET's Babar Shabbir (Monash), also introduces possible applications of atomically-thin ferromagnets in novel dissipationless electronics, spintronics, and other conventional magnetic technologies.

[Read more online.](#)



## Excitonic systems conference, Melbourne 2020

- [Confirmed speakers](#)
- [Call for abstracts](#)
- [Arts Centre Melbourne](#)

Abstracts are now being taken for the 10th International Conference on Spontaneous Coherence in Excitonic Systems (ICSCE10) in Melbourne 28-31 Jan 2020.

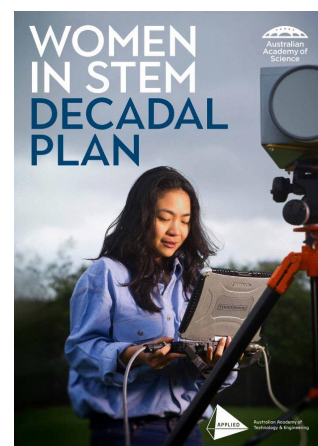


## Equity plan

The new Australian plan to improve equity in science has been revealed, making the case for change, and laying out the framework for necessary changes.

**Not just an equality perspective, but a business imperative** The Women in STEM Decadal Plan makes the economic case for gender equity, including persuasive evidence of the value of a diverse workforce (see page 10).

[Read the plan online.](#)



## Steminist breakfast in Ballarat

FLEET's Dianne Ruka spoke to 60 future scientists in Ballarat (Victoria, Australia) this month, part of the annual VicPhysics Girls in Physics breakfast series.

Dianne addressed the year 10–12 students on future computing and low-energy electronics, as well as discussing science career possibilities for girls from rural communities.

[Read coverage from the Ballarat Times online.](#)





## Peering into the private life of electrons

The quantum studies of FLEET Partner Investigator Ali Yazdani (Princeton) have been profiled at the Gordon and Betty Moore Foundation. This is a good, introductory description of the probing of topological quantum Hall phases by Ali and his team.

[Read the article online.](#)

Ali Yazdani is an Experimental Investigator in Quantum Materials for the Foundation, investigating electronic properties via directly visualisation of electronic wave-functions.



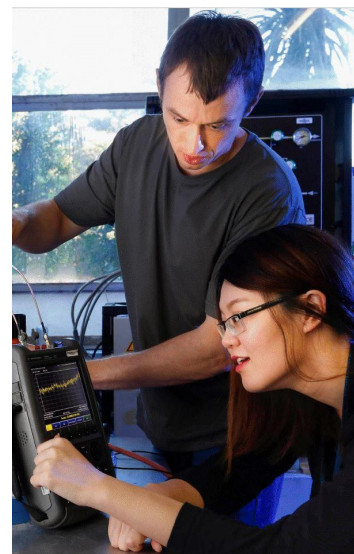
## Previous news

**I can't believe it's not graphene** New atomic-deposition facility for nano-engineering of artificial graphene at UNSW described as like "driving a brand new Maserati" compared with the old equipment. Read more about the new facility and FLEET's artificial graphene research program at UNSW [online](#).



**Outstanding referee recognised** FLEET's Meera Parish (Monash University) named a 2019 Outstanding Referee by the influential American Physical Society (APS), the only one in Australia. [Read more online.](#)

**Media catchup** Torben Daeneke and Kourosh Kalantar-zadeh spoke to media about their recent carbon-capture work. [Listen to the interviews online.](#)



**Briefing RSV members** Carlos Kuhn, Rebecca Orrell-Trigg and Meera Parish spoke to the Royal Society of Victoria last week about ICT energy and FLEET research, with the highly science-engaged audience asking some excellent, probing questions. [Catch the edited version on Youtube.](#)

**Carlos Kuhn: supercool guest editor** FLEET's Carlos Kuhn (Swinburne) will be guest editor of a special ultracold quantum gases issue of the open-access journal Atoms. [See more online.](#)

**Lindau team confirmed** Three FLEET researchers have been confirmed in the ten-member team of early-career Australian scientists representing Australia at the annual Lindau Nobel Laureate Meeting this year in Lindau, Germany (June-July). Congratulations to Eliezier (Eli) Estrecho ANU, Hareem Khan (shown, right) RMIT and Matthew (Matt) Reeves UQ. [Read more online.](#)

**New (and returning) members** We welcomed a number of new Centre members last month, including six New PhD students (in most cases, having decided to continue with us after their FLEET Honours projects) three new Research Fellows and a new Executive Officer. [Meet them online.](#)



## Events coming up

- **3 May** Prof Madhu Bhaskaran Oxide (RMIT) based stretchable devices, UNSW
- **7 May** Dr Julie Karel (Engineering Monash) FLEET seminar at UNSW
- **13-14 May** International Conference on Optics, Lasers & Photonics, Tokyo, Japan
- **20-26 May** FLEET stall at Melbourne Knowledge Week, Melbourne
- **3 June** International Summit on Optics, Photonics and Laser Technologies, San Francisco
- **10 June** International Conference on Materials Research and Nanotechnology, Rome
- **20 June** Physics in the Pub Melbourne
- **25 June** Graphene 2019, Rome

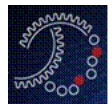
## Prizes & opportunities

**Royal Society of Victoria Physical Sciences** prize is open for final-year, PhDs at Victorian universities, with a first prize of \$1000, and runner up \$500. Deadline 31 May.



**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.



**APR Intern** provides internship opportunities within Australia for PhD students at various points in their candidature. See current opportunities online. A current position in Melbourne (generation of a solid model of a cutting tool) indicates skills FLEET affiliates might have, specifically programming, 3D graphics, etc.

## 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.

