

FLEET News: March 2021

FLEET's 2020 annual report is now out, with this edition being fully online. Check it out at the link below, and let us know what you think.

Also see a new video version of the FLEET story, explaining the Centre's core challenge and quickly exploring a couple of FLEET's research streams.



This edition of the newsletter also features 'Terminator-like' machine identification of imperfections in 2D materials from Swinburne, a magazine article by FLEET members at UQ, thermoelectric funding at UOW, students at UNSW, and other members on the radio, and presenting to the APS March meeting.

Regards,
Prof Michael Fuhrer
Director, FLEET

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The report is in...

We're super excited to let you know that FLEET's 2020 annual report is now **online**:

AR2020.FLEET.org.au

The report details an extraordinary level of scientific output last year, as well as FLEET's response to COVID-19. We hope you'll enjoy the new online format, which is much easier to navigate and share with others (just share the relevant page's URL), as well as being a bit gentler on the planet.



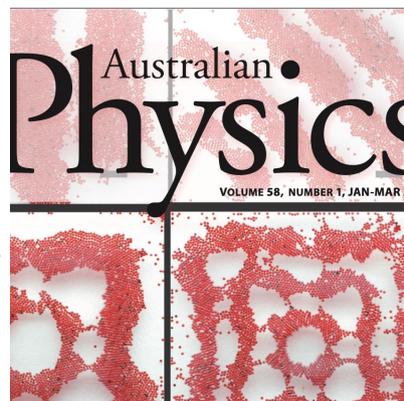
Target acquired!

Pavel Kolesnichenko led a Swinburne study teaching machines to identify imperfections in 2D materials just as Arnie could discriminate between “clothes, boots, a motorcycle”. The simple, automated optical identification of fundamentally different physical areas on these materials (eg, areas displaying doping, strain, and electronic disorder) via machine learning could significantly accelerate the science of atomically-thin materials. [Read more online](#)



Australian Physics article features vortex ordering at UQ

Grab the latest copy of the AIP's *Australian Physics* magazine to read an article written by FLEET-UQ's Oliver Stockdale, Matt Reeves and Matt Davis about vortex ordering in 2D superfluids. AIP members can access the edition [online](#).



FLEET PhD students hit the airwaves

Three FLEET PhD students this month featured on popular radio science show Einstein a go-go's regular "20 PhDs in 20 minutes" segment. In this format, student and host each get a minute, covering the student's entire project in just two minutes combined. The three FLEET presenters were Alex Nguyen (Monash), Matt Gebert (Monash) and Abigail Goff (RMIT). [Listen online](#)



APS presentations

FLEET was extremely active in the online APS March Meeting this month. [Check the list online](#) for FLEET members and affiliates who presented, and if you registered for the conference, you can click-through for catch-up videos via each presenter's page.



Thermoelectric funding at UOW

FLEET CI Xiaolin Wang's breakthrough thermoelectric materials work with Zengji Yu, David Cortie (UOW) and Kirrily Rule (ANSTO) has been profiled in a University of Wollongong article about new ARC funding for energy projects. [Read the article online](#).



UNSW summer students

Alex Hamilton's QED-UNSW group recently hosted four summer students, working alongside FLEET and Sydney Quantum researchers on their own, 6-week 'hands-on' nanofabrication & characterisation projects.

[Meet the students online](#)



Monthly FLEET seminar: Aydin Keser nonlinear quantum EM

Tomorrow (Thursday 1 April) at 11AM Aydin Keser (UNSW) will explain strong nonlinearity in Dirac materials at much lower fields than in neutron stars or heavy ion colliders, allowing exploration of non-perturbative, very high field limit of quantum electrodynamics in solids, proposing experiments and discussing applications in novel materials.

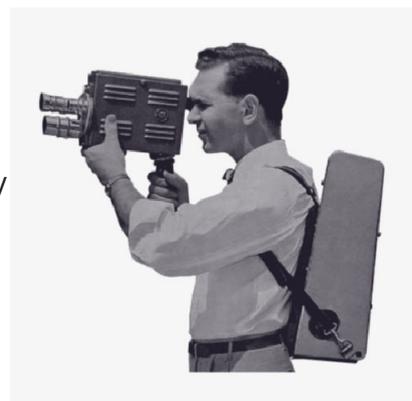


[See details online](#)

Watch the new FLEET video

A new FLEET video spells out the Centre's central challenge—seeking a sustainable future for computing—as well as spotlighting a couple of research threads within FLEET (we only had time to give a taster, sorry!), and the Centre's wider efforts in equity and outreach.

Feedback is very welcome! [Please watch the video online](#), and feel free to share with your networks (eg, via [LinkedIn](#)). Thanks to FLEET alum Dianne Ruka for expert narration.



Equity and diversity at FLEET in 2021

Help FLEET celebrate diversity by marking specific national and/or international days. **Please suggest** cultural days or events the Centre could celebrate.

We'll continue to provide access to equity and diversity issues training through the Diversity Council of Australia, as well as topics identified in our annual survey of members.

Catch up on March talks

Research commercialisation – Scientist, educator and entrepreneur Dr Erol Harvey—founder of the world-leading microfluidic engineering company MiniFAB—presented a special FLEET seminar, sharing his significant experience in research commercialisation and entrepreneurship. **Catch up online.**



FLEET live-streamed seminar: reservoir computing UWA's Mikhail Kostylev described reservoir computing, a specific type of a neural network suitable for modelling complex dynamical systems. **Catch up online.**



Topological physics at light-matter interface
FLEET Partner Investigator Gil Refael (Caltech)

explained the applications of topological phases in new quantum devices, and demonstrated how topological insulators take a new life when combined with photonics, giving rise to topological-polaritons, new paradigms for infra-red detectors and energy harvesting, and new methods for conversion and amplification of low frequency EM radiation.

Catch up online.



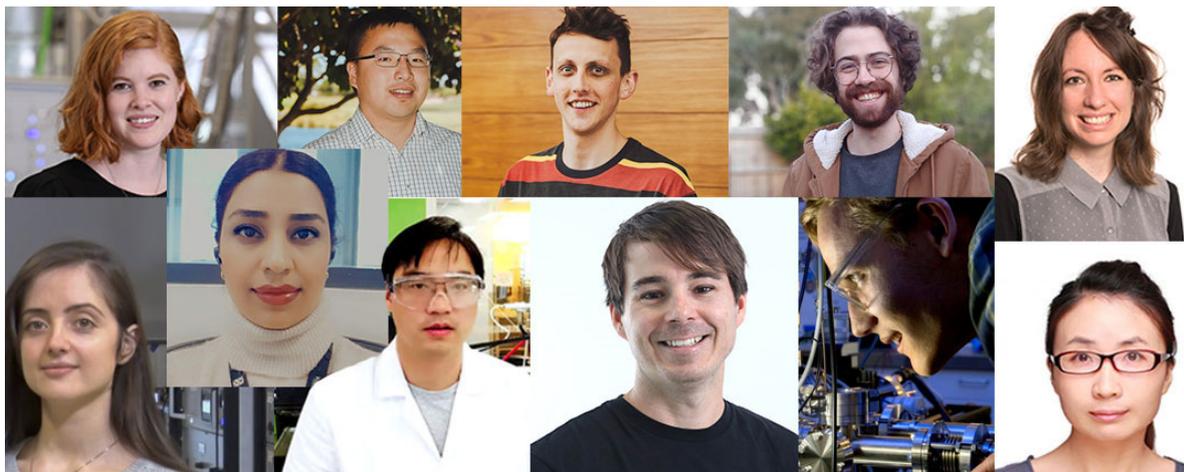
ht-matter
FLEET JOINT QUANTUM INSTITUTE

Gil's talk was part of the ongoing US-Australian colloquium series (**see upcoming talks**).

Congratulations to our ECR authors this month

Congratulations to Yuefeng Yin, Haydn Adlong, Jackson Smith, Guangsai Yang, Lina Sang, Dan Sando, Iolanda Di Bernado, Jack Hellerstedt, Karina Hudson, Emma Laird and Maedehsadat

Mousavi... who are first or second authors in **our most-recent publications**.



Development opportunities

FameLab is a global science-communication competition for early-career researchers in STEM. Applications close end April.

Apply online .



Pint of Science Australia is looking for both volunteers and speakers for Pint of Science in May, which will be online again in 2021. **Details online**.

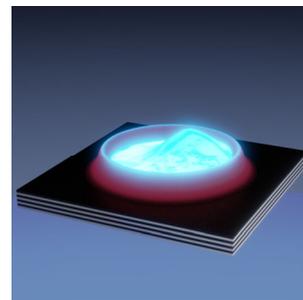
Physics in the Pub is back in an actual physical pub, in Canberra, and seeking presenters also for May. **See details online**.

For other outreach skills opportunities see **L'Oreal Women in Science** mentoring, **Techgirls**

- **Women in FLEET Scholarships** are open to students who identify as female and are accepted into an Honours or PhD program to work with any one of FLEET's investigators. Considered twice a year in June and November. Submit applications anytime.

Previous news

'Sloshing' superfluids at ANU A study led by ANU's Eliezer Estrecho reveals superfluid properties in light-matter fluid in a 'bucket' formed by containment lasers. The team serendipitously observed the wavy motion of the quantum fluid in an optically-controlled bucket, gaining new insights of the intriguing superfluid properties of this peculiar, hybrid light-matter system. [Read more online](#)



Harnessing socially-distant molecular interactions Could long-distance interactions between individual molecules forge a new way to compute? Based on a study led by FLEET alum Marina Castelli, future computers could use the changing shape of electronic states induced by these interactions as individually addressable units. [Read more online](#)

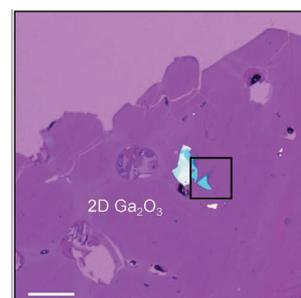
Why do you love working in science? To mark Women in Science Day last month, FLEET's Iolanda Di Bernardo (Monash) asked other women in FLEET what it is that they love about being a scientist, and investigated the question 'why do we need a special day to celebrate women in science?' [Read the answers online](#)



UNSW team update: Oliver Bromhead-Bloise Congratulations to UNSW's Cecilia and Andrew Bromhead-Bloise, who welcomed Oliver to the family at the end of December.

Creating armour for fragile quantum technology A FLEET ANU-led collaboration

extremely fragile quantum systems, making



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.

