FLEET ARC CENTRE OF EXCELLENCE IN FUTURE LOW-ENERGY ELECTRONICS TECHNOLOGIES

FLEET News

There are two excellent studies out this month in *Nature* journals by FLEET researchers:

Jan Seidel (UNSW) was invited to review current and future research around ferroic and multiferroic domain walls, for *Nature Materials*.

And Torben Daeneke and colleagues at RMIT have published their study on using liquid-metal techniques to remove CO_2 from the atmosphere, which could have very far-reaching consequences for climate-change amelioration.

Meanwhile, congratulations are also due to FLEET students Karina Hudson, Matt Rendell and Bernard Field. Read on for their achievements, later in this newsletter.

Regards,
Michael Fuhrer
Director, ARC Centre of Excellence in Future Low-Energy Electronics Technologies

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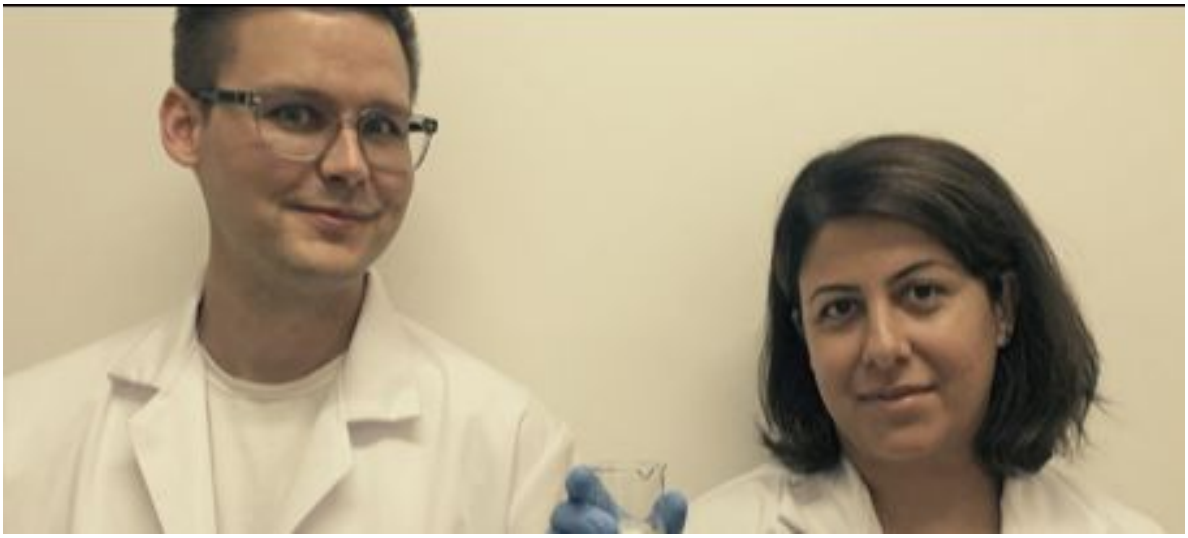
In this edition:

Liquid metals harnessed to convert CO_2 back into carbon

FLEET's Torben Daeneke and colleagues at RMIT have published a major study demonstrating use of liquid metals to turn carbon dioxide back into solid carbon, in a world-first breakthrough

Torben, Kourosh Kalantar-zadeh and Ali Zavabeti worked with RMIT's Dorna Esrafilzadeh on the project, which was published this week in *Nature Communications*.

Read more about the study online.



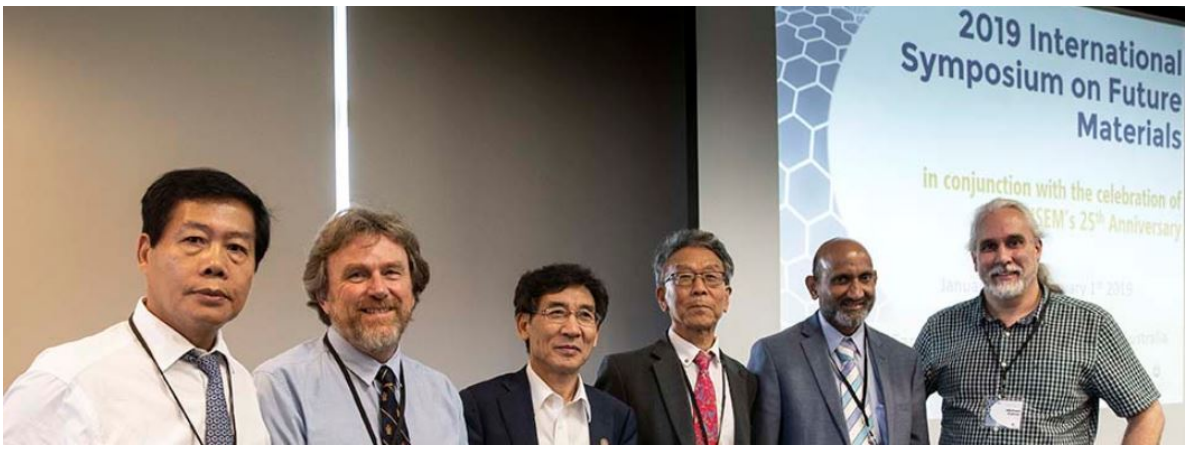
Topological defects reviewed: Jan Seidel's invited article in Nature

FLEET's Jan Seidel (UNSW) has been invited to review current and future work on topological strucutres and domain walls for *Nature Materials*. The article reviews different types of 'defective' order (ie, topological structures) in materials, and their potential highly interesting applications in nanotechnology and nanoelectronics. Read more online.

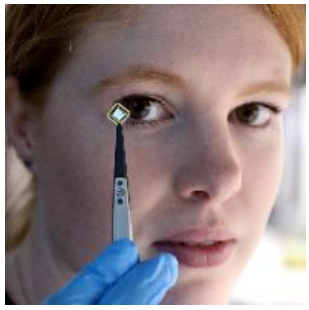
Future materials in Wollongong

An international symposium on future materials held at UOW this month saw presentations from over 110 speakers, covering functional and energy materials, electronic and optical materials, spintronics, superconductivity, emergent materials physics and chemistry, biomaterials, nanomaterials, interface science and magnetism.

Xue (Tsinghua), Research Fellow Feixiang Xiang (UNSW) and CIs Lan Wang (RMIT) and Qiaoliang Bao (Monash) were among invited presenters.



Achievements and congratulations



Congratulations to FLEET's **Karina Hudson (UNSW)**, whose PhD thesis describing research into hole spins in semiconductor quantum wires has been accepted.

Matthew Rendell (UNSW) was recipient of the prestigious 2019 CSIRO Alumni Physics Scholarship, and will use the scholarship award to visit the QUTech group at TU Delft (Netherlands). Read more about the Award online.

Honours student Bernard Field (Monash) has won the Monash University Rodney Turner Prize for Best Honours Thesis in Physics and Astronomy and JJ McNeill Prize for Top Honours Student in Physics.

Congratulations to Karina, Matt and Bernard.

FLEET in the news

FLEET's Michael Fuhrer was interviewed on Radio New Zealand earlier this month about topological materials and their part in future, ultra-low energy electronics. Listen online.

Monash AI Mark Edmonds has also been on the airwaves, speaking to community radio science show *Lost in Science*, discussing the recent topological switching discovery. Listen online (Mark's segment starts at 10 minutes.)

Women in science in the media

Recognising the need to improve the diversity of expert talent and spokespeople across news programming, the ABC is seeking women in science as new subject matter experts. Register via online form.

"If you have never participated in a media interview or written an op-ed before and feel nervous or unsure, please don't be discouraged from nominating.

"The ABC says it is deliberately looking for fresh, diverse voices and perspectives from women of all backgrounds and ages to add to our talent pool, so be bold and put up your hand!

—Rhiannon Hobbins
50:50 Lead, ABC News

Future of electronics talk, Melbourne

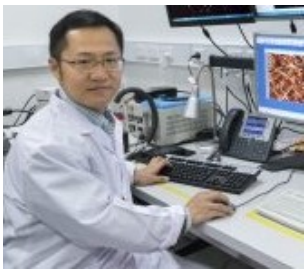
Three FLEET researchers will describe FLEET research and the background of ICT energy use in a presentation to the Royal Society of Victoria, in March. If you're in Melbourne, please come along, and help spread the message to family, friends and colleagues. Details and bookings online.

Excitonic systems conference, Melbourne 2020

Hot on the heels of ICON-2DMat success, FLEET theme 2 members are now planning a major exciton conference in early 2020, which FLEET will host.

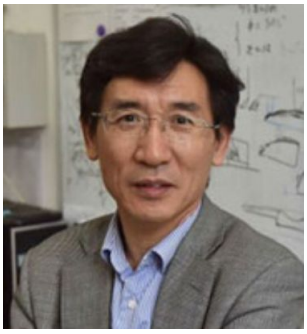
FLEET will be hosting the 10th International Conference on Spontaneous Coherence in

Previous news



2D materials key to earlier cancer detection Monash Engineering CI Qiaoliang Bao led a collaboration unlocking possible earlier detection of cancer using sensitive 2D materials. Read more online. The story received significant coverage online, including an interview on SBS Mandarin.

FLEET's fruitful relationship with Tsinghua University (Beijing) has been expanded, with the Centre welcoming two new Partner Investigators to lead research collaborations. Read more online, including profiles of FLEET's two new PIs: Prof Shuyun Zhou and Prof Pu Yu.



Qi-Kun Xue at Tsinghua University (Beijing) has been recognised for discovery of the quantum Hall effect, with potential for ultra-low energy electronics, reducing energy cost and heat emission, with 1st prize in China's Science and Technology Awards. Read more about the award online.

Events coming up

- **28 February** Lukas Eng seminar on topological and polaritonic material study UNSW
- **4-8 March** APS March meeting, Boston US
- **14 March** FLEET Future of electronics talk at RSV, Melbourne
- **31 Mar-4 Apr** ACS National Meeting & Expo, Orlando US
- **15-16 Apr** International Conference on Laser, Optics and Photonics, Frankfurt, Germany
- **22-26 Apr** MRS Spring Meeting & Exhibit, Phoenix, USA
- **13-14 May** International Conference on Optics, Lasers & Photonics, Tokyo, Japan
- **20-26 May** FLEET stall at Melbourne Knowledge Week, Melbourne
- **13-14 May** International conference on optics, lasers & photonics, Tokyo, Japan

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