FLEET

ARC CENTRE OF EXCELLENCE IN FUTURE LOW-ENERGY ELECTRONICS TECHNOLOGIES

STRATEGIC PLAN 2023-2024

OUR STRATEGIC PRIORITIES

1 — Enable discoveries at the scientific frontier

2 — Develop next generation of science leaders

3 — Establish synergistic partnerships with industry, academia & government

**4** — Foster equity & diversity in Science Technology Engineering & Mathematics (STEM)

5 — Promote public science literacy

6 — Facilitate internal and external communica-tion to support FLEET's strategic goals

MISSION VISION

FLEET will develop the scientific foundation and intellectual property for a fundamentally new electronics technology, which will super-cede silicon. The Centre will build capacity in Australia for advanced electronics research, and train the workforce for the electronics industry of the future. FLEET will place Australia at the forefront of the international electronics industry through the development of innovative electronics technologies.
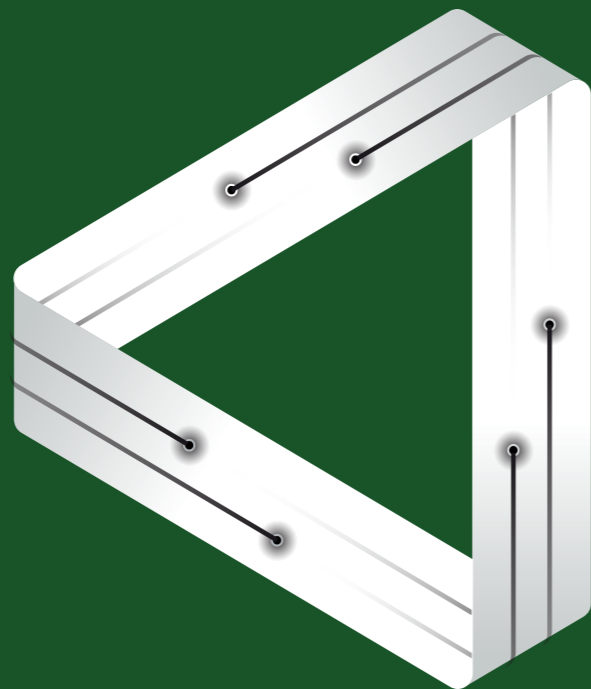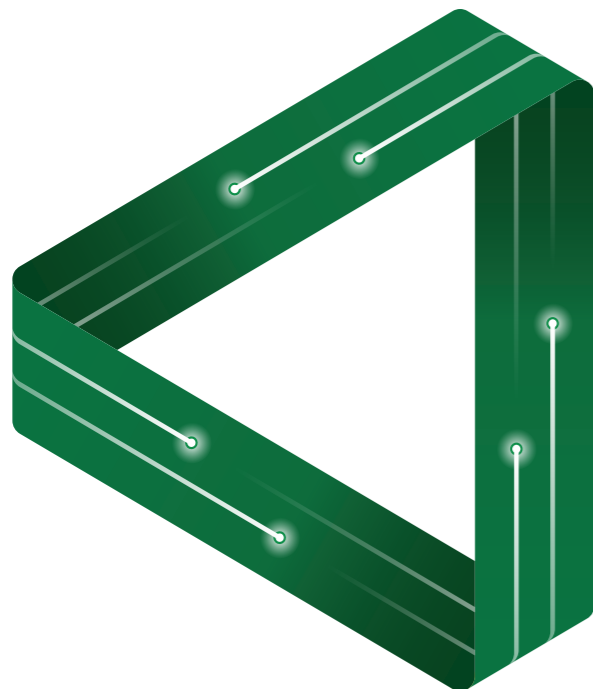
FLEET envisions extending the information technology revolution sustainably into the future through a new, more energy-efficient computing technology developed in Australia.

OUR VALUES

INNOVATE

FLEET nurtures a culture of scientific curiosity to advance knowledge

COLLABORATE

FLEET seeks to build synergistic partnerships across disciplines with international research, industry and educational networks

ENGAGE

FLEET encourages team cohesion and cultivates a growth mindset

STRATEGIC PRIORITY 1: ENABLE FRONTIER SCIENTIFIC DISCOVERIES

KEY INITIATIVES	CENTRE PLANS	ACCOUNTABILITY	METRICS
1.1 Realise topologically-protected dissipationless transport of electrical current at room temperature, and novel devices based on the ability to switch on and off this dissipationless current	Research Plan Pages 12-15	Research theme 1 researchers Enabling technologies A and B researchers	Project milestones and research outputs
1.2 Demonstrate excitonic dissipationless transport at elevated temperatures	Research Plan Pages 16-18	Research theme 2 researchers Enabling technology A researchers	Project milestones and research outputs
1.3 Investigate and realise systems that exhibit dissipationless transport by dynamically driving the systems out of equilibrium to explore new paradigms in electronics	Research Plan Pages 19-21	Research theme 3 researchers	Project milestones and research outputs

Research theme 1 - Topological dissipationless systems

Research theme 2 - Excitonic dissipationless systems

Research theme 3 - Dynamically-controlled dissipationless systems

Enabling technology theme A - Atomically-thin materials

Enabling technology theme B - Nano-device fabrication

STRATEGIC PRIORITY 2: DEVELOP NEXT GENERATION OF SCIENCE LEADERS

KEY INITIATIVES	CENTRE PLANS	ACCOUNTABILITY	METRICS
2.1 Develop world-class training & mentoring programs	Education & Training Plan Pages 30-32 Communications Plan Pages 35 - 36	Education & Training committee	Number of: • participating members • external mentors • research/ professional development courses • members and non-members participating in Centre training workshops • mentoring programs • organisational links in mentoring and training programs
2.2 Establish Centre succession planning for the centre	Succession Plan Page 25-26	Executive committee	Established plan
2.3 Facilitate opportunities for research collaboration 2.4 Establish a collaborative culture within the Centre	Sustainability Plan Page 23 Education & Training Plan Pages 30-32 Communications Plan Pages 35 - 36	Research leaders	Number of: • travel grants to facilitate collaboration • FLEET-wide colloquia, and research seminars and workshops • collaborative visits by FLEET partners • intra-Centre expertise exchange • new organisations collaborating with FLEET
2.5 Facilitate opportunities for career development in industry	Education & Training Plan Pages 30-32	Executive committee	Number of internship placements
2.6 Identify opportunities for members to be recognised	Education & Training Plan Pages 30-32	Executive committee	Number of awards and grants received by members for their scientific / leadership achievements

STRATEGIC PRIORITY 3: FACILITATE PARTNERSHIP DEVELOPMENT

KEY INITIATIVES	CENTRE PLANS	ACCOUNTABILITY	METRICS
3.1 Establish international partnerships	Research Plan Pages 12-21 Sustainability Plan Page 23 Industry Engagement Plan Page 29 Communications Plan Pages 35 - 36	Research leaders Education & Training and Outreach committees	Number of: • new research organisations collaborating with FLEET • collaborative visits between members and collaborating organisations • organisational links in training and mentoring programs • organisational links in education and outreach programs
3.2 Establish links to industry and end users	Sustainability Plan Page 23 Translation Plan Page 24 Industry Engagement Plan Page 29 Communications Plan Pages 35-36	Industry relations and Communications committees	Number of: • briefings to end-users / industry • internship placements with industry collaborators
3.3 Create a network to commercialise FLEET discoveries	Translation Plan Page 24 Industry Engagement Plan Page 29	Industry relations committee	Number of: • relationships with end-users • industry engagement workshops

STRATEGIC PRIORITY 4: FOSTER EQUITY / DIVERSITY IN STEM

KEY INITIATIVES	CENTRE PLANS	ACCOUNTABILITY	METRICS
4.1 Foster a culture of equity and inclusiveness	Equity & Diversity Plan Pages 27-28 Communications Plan Pages 35 - 36	Equity & Diversity and Communications committees	Number of positive responses to annual surveys Level of compliance of all events organised / supported by FLEET with Centre's Equity and Diversity guidelines Increased participation of required training on equity, diversity and inclusion topics Awareness to recognise unacceptable behaviour and pathways to report
4.2 Increase diversity among all cohorts of researchers	Equity & Diversity Plan Pages 27-28	Equity & Diversity committee	Increased number of researchers and HDR students from marginalised groups across FLEET Level of compliance of FLEET HR policy in all Centre recruitments
4.3 Establish career support initiatives for women in FLEET and members with caring responsibilities	Equity & Diversity Plan Pages 27-28	Equity & Diversity committee	Gender ratio of ECRs staying in FLEET and science careers beyond FLEET Increased participation of FLEET researchers with family / carer responsibilities in FLEET / external events
4.4 Establish a women-specific mentoring network	Equity & Diversity Plan Pages 27-28 Education & Training Plan Pages 30-32	Equity & Diversity committee Education & Training committee	Increased uptake of mentoring opportunities by women in FLEET

KEY INITIATIVES	CENTRE PLANS	ACCOUNTABILITY	METRICS
5.1 Conbribute to the scientific literacy and understanding of STEM and FLEET science among primary and secodary students and teachers	Outreach Plan Pages 33-34 Communications Plan Pages 35 - 36	Outreach and Communications committees	Evaluation of the understanding and literacy at school-based engagement events
5.2 To raise awareness of FLEET research among the general public	Outreach Plan Pages 33-34 Communications Plan Pages 35 - 36	Outreach committee	Evalution of awareness at public engagement events Relevant social media metrics to assess engagement

STRATEGIC PRIORITY 6: FACILITATE EFFECTIVE COMMUNICATION

KEY INITIATIVES	CENTRE PLANS	ACCOUNTABILITY	METRICS
6.1 Support Centre strategic goals through internal communication using tools such as monthly newsletters	Communications Plan Page 35 - 36	Communications committee	Improvement in internal newsletter readership
6.2 Engage with scientific research community through research stories published on key online science platforms and stakeholders' newsletters	Communications Plan Page 35 - 36	Communications committee	Number of: • research stories • newsletter audience
6.3 Promote FLEET research and scientific literacy to public through web content and social media	Communications Plan Page 35 - 36	Communications and Outreach committees	Number of: • social media audience reached on priority channels (Twitter, Facebook) • mainstream media articles • mentions of FLEET research in all media channels
6.4 Engage with key partners	Sustainability Plan Page 23 Communications Plan Page 35 - 36	Communications and Outreach committees	Number of: • briefings to government agencies and NGOs • public presentations annually

STRATEGIC PRIORITY 6: FACILITATE COMMUNICATION

KEY INITIATIVES	CENTRE PLANS	ACCOUNTABILITY	METRICS
6.5 Empower FLEET members to communicate their own scientific work	Communications, Outreach, Education & Training Plans Pages 30-36	Communications and Outreach committees	Number of: • non-peer reviewed articles • members discussing their science on social media • members presenting their research in a public forum • ECR and student members participating in Three-Minute Thesis, FameLab, Science in the Pub, and similar
6.6 Push the boundaries of what we're doing in communications, seeking and championing communications "best practice"	Communications Plan Page 35 - 36	Communications committee	Number of new initiatives each year

Strategic Statement: Research theme 1 aims to realise topologically-protected dissipationless transport of electrical current at room temperature, and to develop novel devices based on the ability to switch on and off this dissipationless current.

The key overall challenges are:
(i) to demonstrate external control of this topologically protected current, which would enable new forms of low power switches, and
(ii) to extend topological protection from low-temperature demonstrations to high temperature operation. Three approaches are being pursued to achieve these objectives:

Approach 1: Electric-field tuned quantum phase transition. The electric-field tuned quantum phase transition (QPT) from conventional to topological insulator provides the basis for a topological transistor in which the topological insulator represents the "on" state with conduction through dissipationless edge modes, and the conventional insulator represents the "off" state. The goal is to develop topological insulators with wide band gaps and robust dissipationless or extremely low energy surface states. The milestones associated with this approach are M1.1 - M1.5.

Approach 2: Topological Dirac Semimetals and other topological systems. The aim is to engineer dissipationless or low energy states by combining different materials that can be used to store or process information. Several approaches have been identified, based on the following questions:

1. Is it possible to realise Quantum Anomalous Hall Effect (QAHE) in van-der Waals heterostructure systems that combine 2D topological insulators with ferromagnetic insulators? The challenge is that most (ferro) magnetic systems are metallic, and ferromagnetic insulators are rare.
2. Can the properties of ferro(ferri)magnetic oxide insulators be exploited and used as substrates to engineer topological states in atomically-thin 2D materials?
3. Can topological electronic or magnetic systems be engineered in oxide heterostructures?

The milestones associated with this approach are M1.6 - M1.8 and M1.17.

Approach 3: Engineering artificial topological systems The aim of this approach is to use advanced nanopatterning techniques to create artificial graphene and artificial topological insulators from different heterostructure material systems.

The milestones associated with this approach are M1.9 - M1.12.

Approach 4: To develop novel wide-gap topological insulators with robust dissipationless surface state and 2D magnetic topological insulators for QAHE. Single crystal growth and thin film deposition will be used to synthesise high-quality topological insulator materials.

The milestones associated with this approach are M1.3 - M1.16.

RESEARCH THEME 1: TOPOLOGICAL DISSIPATIONLESS SYSTEMS

	MILESTONES & DELIVERABLES	YEAR	RESEARCHERS RESPONSIBLE
M1.1a	Develop techniques for electrical probing of ultra-high vacuum (UHV)-prepared topological materials (Fuhrer/Schiffrin labs), such as capping, mesoscopic electrode fabrication, gate structures	2017-2021 completed	Fuhrer, Schiffrin, Edmonds
M1.1b	Debelop techniques for fabricating and probing van der Waals in UHV with STM and electrical transport	2021-Jun 2024	Fuhrer, Kumar, Schiffrin, di Bernado, Edmonds
M1.2	Electric field tuning of bandgap in van der Waals and Xene topological materials (with Enabling technology themes A and B)	2017-Jun 2024	Fuhrer, Hamilton, Medhekar, Kalantar-Zadeh, L. Wang
M1.3a	Understand phase of 2D Xenes on various substrates - a possible 2D quantum spin Hall system with large bandgap on oxide FM layers (with Enabling technology theme A)	2017-Jun 2024	Fuhrer, Medhekar, Edmonds
M1.3b	Understand electronic, magnetic and topological phases, multiferroicity of 2D vdW materials and heterstructures on various substrates (theory and experiment)	2021-Jun 2024	Kumar, Medhekar, Tang
M1.4	Understand prospects of electric-field switching of QPT for low-voltage switching	2017-Jun 2024	Cole, Culcer, Fuhrer, Medhekar, Zhang
M1.5	DFT-validated effective tight binding models, preliminary transport models for a prototype material (few layer polytypes of Bismuth)	2019-2021 completed	Cole, Medhekar
M1.6	Understand magnetic proximity effects at the interfaces of vdW heterostructures	2020-Jun 2024	Cole, Fuhrer, Medhekar, Edmonds, L. Wang
M1.7	Investigate proximity effects for strong and tuneable magnetic coupling and other topological devices (with Enabling technology theme B)	2017-Jun 2024	Fuhrer, Karel, X. Wang, Cortie, Edmonds, L. Wang
M1.8	Develop theoretical models that include effects of disorder (effective Hamiltonian, DFT, Density matrix)	2017-Jun 2024	Cole, Culcer, Medhekar, Smith, Asgari

RESEARCH THEME 1: TOPOLOGICAL DISSIPATIONLESS SYSTEMS

	MILESTONES & DELIVERABLES	YEAR	RESEARCHERS RESPONSIBLE
M1.9	Fabricate artificial lateral superlattices in heterostructure materials such as GaAs, BFO/LAO/STO (with Enabling technology theme B)	2017-2019 completed	Hamilton, Karel, Klochan, Seidel, Valanoor
M1.10	Demonstrate artificial bandstructure effects controlled by engineered lateral superlattices in conventional materials	2017-Jun 2024	Hamilton, Karel, Klochan, Seidel, Sushkov, Valanoor, Smith
M1.11a	Realise artificial topological systems by adding spin-orbit interactions to artificial graphene	2017-Jun 2024	Hamilton, Karel, Klochan, Seidel, Sushkov, Valanoor, Hudson
M1.11b	Examine strong correlations in artificially engineered lattices	2021-Jun 2024	Hamilton, Klochan, Sushkov, Hudson
M1.11c	Combine artificial lattices with strong 2D materials (BLG, etc…)	2021-Jun 2024	Hamilton, Klochan, Sushkov
M1.12	Investigate correlations and topology in 2D metal-organic nanomaterials	2017-Jun 2024	Fuhrer, Medhekar, Schiffrin, Tadich, Edmonds
M1.13	Synthesise and optimise a wide-band gap topological insulator (with Enabling technology theme A)	2017-2019 Completed	X. Wang
M1.14	Synthesise and optimise a 2D Ferromagnetic Material with a high Curie temperature (with Enabling technology themes A and B)	2017-2021 Completed	Cortie, L. Wang
M1.15	Achieve Anomalous Hall Effect, ideally Quantum Anomalous Hall Effect in a new magnetic system (with Enabling technology themes A and B)	2017-Jun 2024	Karel, X. Wang, Granville, Cortie, Li, L. Wang, Yue

RESEARCH THEME 1: TOPOLOGICAL DISSIPATIONLESS SYSTEMS

	MILESTONES & DELIVERABLES	YEAR	RESEARCHERS RESPONSIBLE
M1.16	Create materials for Research themes 1 -3	2017-Jun 2024	Kumar, X. Wang, Li, Tang, Kalantar-zadeh, L. Wang, Yue
M1.17	Understanding topological protection in interacting topological insulators	2017-Jun 2024	Fuhrer, Sushkov, Paglione

Strategic Statement: Research theme 2 aims to demonstrate dissipationless behaviour of excitons and exciton-polaritons at room temperature.

Approach 1: Indirect exciton condensates in atomically-thin bilayer semiconductor heterostructures. Atomically-thin semiconductor layers separated by atomically-thin dielectrics will be fabricated to realise spatially indirect excitons with large binding energy (much greater than room temperature). We will study the optical and electrical injection of excitons in these structures. The ultimate goal is to demonstrate exciton superfluidity at elevated temperatures (up to room temperature) with electrical signatures in interlayer tunneling and electron-hole counterflow.

The milestones associated with this approach are M2.1.1 - M2.1.4.

Approach 2: Exciton-polariton condensates and dissipationless transport in atomically-thin semiconductors at room temperature. Atomically-thin transition metal dichalcogenides (TMDs) will be integrated into high-Q microcavities enabling strong light-matter coupling and formation of polaritons. The ultimate goal is to demonstrate condensation and superfluidity (dissipationless transport) of polaritons in the monolayers at room temperature, as well as a useful device (ultrafast switch).

The milestones associated with this approach are M2.2.1 - M2.2.11.

Approach 3: Topologically protected states of exciton-polaritons in atomically-thin monolayers. The spin-valley degree of freedom in TMDs holds hope for enabling topologically protected transport in microfabricated artificial lattice potentials (hexagonal, kagome, etc) for exciton-polaritons without the need for a magnetic field. Fabrication of microstructured samples for this research would rely on reliable production of high-Q microcavities with embedded large-area (several tens of micrometres) monolayers. Alternative approaches of inducing artificial lattices optically will be explored.

The milestone associated with this approach is M2.3.1.

RESEARCH THEME 2: EXCITONIC DISSIPATIONLESS SYSTEMS

	MILESTONES & DELIVERABLES	YEAR	RESEARCHERS RESPONSIBLE
M2.1.1	Establish vdW fabrication facilities and produce bilayer structures	2017-2020 completed	Fuhrer
M2.1.2	Observe indirect excitons and tunnel-coupling in optical experiments	2017-Jun 2024	J. Davis, Fuhrer
M2.1.3	Fabricate samples and perform low-temperature measurements of interlayer tunnelling in 2D-2D structures	2017-Jun 2024	Fuhrer
M2.1.4	Fabricate samples and observe indirect/bilayer exciton transport at low/room temperature	2017-Jun 2024	Fuhrer
M2.2.1	Fabricate microcavities with TMDs, observe strong light-matter coupling	2017-2019 completed	Ostrovskaya, Lu
M2.2.2	Characterise dynamics and interactions of TMDC excitons at cryogenic and room temperature	2017-Jun 2024	J. Davis, Schiffrin
M2.2.3	Characterise low-energy interactions in exciton systems	2017-2019 completed	Parish, Ostrovskaya, Levinsen
M2.2.4	Characterise dynamics and interactions of excitons & exciton-polaritons (GaAs, TMDC)	2017-Jun 2024	J. Davis, Parish, Ostrovskaya, Schiffrin, Levinsen
M2.2.5	Develop the theory of low-energy interactions in excitonic systems and apply to experimentally relevant scenarios	2017-Jun 2024	Parish, Ostrovskaya, Levinsen
M2.2.6	Observe condensation and superfluidity of exciton-polaritons in a monolayer at cryogenic/room temperature	2017-Jun 2024	Ostrovskaya
M2.2.7	Explore (experimentally) the effects of interparticle interactions in exciton-polaritons in a monolayer at low and room temperature	2017-Jun 2024	Ostrovskaya

RESEARCH THEME 2: EXCITONIC DISSIPATIONLESS SYSTEMS

	MILESTONES & DELIVERABLES	YEAR	RESEARCHERS RESPONSIBLE
M2.2.8	Investigate the transition to Bardeen-Cooper-Schrieffer (BCS) regime, prospect for BCS sueprfluidity of exciton-polartions	2017-Jun 2024	Parish, Ostrovskaya, Levinsen
M2.2.9	Develop new theoretical formalisms for condensation in non-equilibrium superfluids	2017-Jun 2024	M. Davis, Parish, Levinsen, Reeves
M2.2.10	Demonstrate (theoretically) emergent flow states of superfluids between reservoirs	2017-Jun 2024	M. Davis, Reeves
M2.2.11	Develop strategies for the design of channels and manipulation of vortices in 2D superflows to enhance critical currents	2017-Jun 2024	M. Davis, Reeves
M2.3.1	Demonstrate, theoretically and experimentally, topologically-protected states in an exciton-polariton system	2017-Jun 2024	Ostrovskaya

Strategic Statement: The goal of Research theme 3 is to investigate and realise systems that exhibit dissipationless transport when driven out of equilibrium, using periodic driving (Floquet) and/or single/few-cycle strong fields.

Approach 1: Dynamically engineered topological states. Utilising 2D semiconductors and cold atoms driven in different ways, complementary approaches are being pursued to realise, understand and control Floquet topological insulators. The research will focus on the realisation of topological states in TMDs subject to periodic optical driving.

The milestones associated with this approach are M3.1.1 - M3.1.8

Approach 2: Dynamically engineered dissipationless transport. Investigating strategies beyond the generation of Floquet states for dynamically engineering nonequilibrium conditions that lead to dissipationless transport. The strategies include nonequilibrium superfluidity (dissipationless transport) through modification of quasiparticle spectra using time-dependent potentials and topological superfluidity.

The milestones associated with this approach are M3.2.1 - M3.2.6

RESEARCH THEME 3: DYNAMICALLY CONTROLLED DISSIPATIONLESS SYSTEMS

	MILESTONES & DELIVERABLES	YEAR	RESEARCHERS RESPONSIBLE
M3.1.1	Demonstrate control of Floquet Bloch bands	2017-2023	J. Davis, Fuhrer, Schiffrin, Kalantar-Zadeh
M3.1.2	Develop approaches to identify topological states	2017-Jun 2024	J. Davis, Fuhrer, Schiffrin
M3.1.3	Identify dynamic topological phase transition	2017-Jun 2024	J. Davis, Fuhrer, Schiffrin
M3.1.4	Image current distribution in Floquet 2D material	2017-Jun 2024	J. Davis, Helmerson
M3.1.5	Investigate topological states in the delta-kicked (Floquet) system with spin-orbit coupling	2017-Jun 2024	M. Davis, Helmerson, Parish, Galitski, Levinsen, Reeves
M3.1.6	Investigate topological states in multi-dimensional Floquet system	2017-Jun 2024	M. Davis, Helmerson, Parish, Galitski, Levinsen, Reeves
M3.1.7	Develop theory of driven (Floquet) dissipative superfluid to improve understanding of nonequilibrium transport	2017-Jun 2024	M. Davis, Parish, Reeves
M3.1.8	Demonstrate field-enhancement for optical control of band structure	2021-Jun 2024	J. Davis, Schiffrin

RESEARCH THEME 3: DYNAMICALLY CONTROLLED DISSIPATIONLESS SYSTEMS

	MILESTONES & DELIVERABLES	YEAR	RESEARCHERS RESPONSIBLE
M3.2.1	Measure sound/transport in 2D Fermi gas	2017-2020 completed	Vale
M3.2.2	Investigate lifetimes, impurities physics, pairing in 2D Fermi gases near s-wave and p-wave Feshbach resonances	2017-Jun 2024	M. Davis, Vale, Levinsen
M3.2.3	Construct quantum gas microscope facility to study dipolar atoms in optical lattices	2017-Jun 2024	M. Davis, Helmerson, Parish, Vale
M3.2.4	Develop new theoretical approaches and numerical methods to treat dynamics of quantum impurities and quasiparticles	2017-2020 completed	M. Davis, Parish, Sushkov, Levinsen
M3.2.5	Control material's topology via single cycle electromagnetic waveforms	2017-Jun 2024	J. Davis, Parish, Schiffrin, Krausz, Levinsen
M3.2.6	Develop new theoretical approaches to model interactions between quantum impurities and quasiparticles	2021-Jun 2024	Parish, Levinsen

CENTRE LEGACIES

FLEET's legacy can be measured against its six strategic priorities as follows:

LEGACIES	LINKS TO STRATEGIC PRIORITIES
Increased understanding of quantum materials & electronic devices	Enable discoveries at the scientific frontier (1) Promote public science literacy (5)
New concepts for low-energy electronics	Enable discoveries at the scientific frontier (1)
Researchers trained in electronics of tomorrow	Develop next generation of science leaders (2)
Capacity for quantum materials/electronic devices research in Australia	Establish synergistic partnerships with industry, academia & government (3)
Strong links to international excellence	Establish synergistic partnerships with industry, academia & government (3)
Translation of FLEET science to industry	Establish synergistic partnerships with industry, academia & government (3)
Increased diversity in STEM and models for inclusive research collaboration	Foster equity & diversity in Science Technology Engineering & Mathematics (4)
Recognition of the grand challenge of sustainable computing by government and society	Facilitate internal and external communication to support FLEET's strategic goals (6)

SUSTAINABILITY PLAN

Objectives:

- Ensure FLEET research mission continues beyond the CE17 funding cycle
- Maximize the benefit to Australia from the established FLEET networks and linkages

Sustainability Strategy:

In 2023-2024 FLEET will consult widely with:

- FLEET's advisory committees,
- semiconductor manufacturer research & development arms,
- industry groups such as SRC and IRDS committee,
- federal and state governments for example Offices as Chief Scientist, and
- overseas funding agencies such as ONR, AFOSR.

In order to:

- understand the role of academic research in the semiconductor industry in the next 10 years,
- identify new research areas where FLEET networks can lead,
- identify new funding streams, and
- shape the industry and government roadmaps for research & development.

These inputs will form a strategy (due mid-2023) for FLEET sustainability, including strategies for:

- engaging new partners to achieve sustainability goals,
- engaging FLEET network with a diversity of funding sources,
- shaping government and industry policy.

Performance will be measured via the following outcomes:

- External support for FLEET research beyond CE23 period
- Ongoing collaboration among FLEET investigators/partners beyond CE23 period
- Continued leadership by Australia in science/technology of electronic materials
- Support from Federal/State governments for research infrastructure, R&D in electronic materials

TRANSLATION PLAN

Objectives:

- Identify FLEET members with the desire and capability to translate their research
- Identify projects within FLEET that are ready for translation
- Train FLEET membership in translation skills

Strategy:

- Provide $500k in strategic funds in 2022/2023 to boost translation projects and provide targeted training
- Engage a consultant to identify promising FLEET projects for translation and provide expertise to shepherd them through the process of establishing linkages. The Executive Committee has identified a candidate, Michael Harvey, with extensive experience in the EQuS CoE.

The consultant will:

- survey the FLEET membership to identify members and projects ready for translation, as well as understanding training needs,
- engage new industrial partners,
- establish a rolling call for proposals for translation projects, and
- work with FLEET Industry Relations and Education and Training Committees and the Centre's Student/ECR Working Group to establish new training programs in areas of need, particularly in IP management.

Performance will be measured via the following outcomes:

- New links with industry - total number of end-user relationships established and technical briefings presented to targeted industry groups
- FLEET knowledge and research translated into applications with industry partners - at least five (5) translation projects developed and supported in 2023
- Students/ECRs trained in translation - number of research and professional development courses and number of Centre attendees at all research/development workshops

SUCCESSION PLAN

Planning for continuity in leadership roles is an important element in ensuring success of FLEET's mission. FLEET's succession plan has the following goals:

- to ensure continuity of leadership: a plan is in place for Centre Director, Chief Operating Officer, Theme Leaders, Governance Committee Chairs, Communications Coordinator, and Education and Training Coordinator
- to mentor future leaders in FLEET through Centre facilitated programs and involvement in Centre leadership postions: Associate Investigators (AIs) and Chief Investigators (CIs) in governance Chair and Deputy Chair roles
- to bring new talent into FLEET through the addition of new investigators, and
- to promote equity in leadership roles: additional female investigators, consider diversity when FLEET leadership opportunities arise.

To accomplish the succession plan, FLEET has adopted the following strategies:

Milestone 2.2.1 Ensure continuity of leadership
A plan is in place for Centre Director, Chief Operating Officer, Theme Leaders, Governance Committee Chairs, Communications Coordinator, and Education and Training Coordinator.

Director. In the event that the Director resigns or leaves FLEET, the Deputy Director of FLEET will be appointed as interim Director. Monash University will undertake an international search for a new Director with appropriate research credentials and leadership ability.

Chief Operating Officer (COO). In the event that the COO resigns from FLEET, Monash University will search for a new COO. In the interim, the Centre Executive Officer, Communications Coordinator and Education & Training Coordinator will work together to carry out the COO's tasks.

Communications Coordinator and Education and Training Coordinator. In the event that a Coordinator resigns from FLEET, Monash University will search for a replacement. The business team will work with relevant Special Governance Committees to carry out the Coordinator's tasks in the interim.

Theme Leaders and Committee Chairs. To ensure a broad base of potential future leaders in FLEET, the Centre will provide leadership opportunities to its members, for example Deputy Theme Leader or Deputy Committee Chair roles. Additionally, FLEET will encourage members to engage in its career development program for mid-career researchers, as outlined below in milestone 2.2.2.

SUCCESSION PLAN

Milestone 2.2.2 Mentor future leaders in FLEET through Centre facilitated programs and involvement in Centre leadership positions

This includes Associate Investigators (AIs) and Chief Investigators (CIs) in governance Chair and Deputy Chair roles.

FLEET will offer multiple roles which provide responsibility and an opportunity to build leadership skills. These include Chairs of the Special Governance Committees (Education & Training, Equity & Diversity, Outreach, Communications, and Industry Relations) and Node Coordinator positions where appropriate.

FLEET will facilitate four different mentoring programs for members at various stages of their careers:

1. Academic mentoring program: for established researchers pursuing leadership positions in academia
2. Early Career Researcher (ECR) mentoring program: for young researchers seeking mentorship from established researchers
3. Women in FLEET mentoring program: for members seeking mentorship in overcoming challenges that are unique for women in the STEM sector
4. Industry mentoring program: for members seeking insight from industry experts.

Milestone 2.2.3 Bring new talents into FLEET through the addition of new investigators

We anticipate that some CIs may depart FLEET or move to another eligible organisation within or outside of FLEET during the funding period of the Centre. The Executive Committee will review the research program and evaluate a strategy. This can include one or more of the following:

- Working with a node to recruit a new CI at the node;
- Adding a new CI or CIs to FLEET;
- Adding new nodes to FLEET;
- Rebudgeting to accommodate change in CIs; and/or
- Changing the strategic plan to remove or add research directions.

To ensure that there are potential future FLEET participants, FLEET should encourage those with synergistic activities to become Associate Investigators in FLEET and to participate in FLEET activities. FLEET will establish a competitive Seed Fund for Associate Investigators with the following goals:

- Support emerging research ideas and new collaborations with the promise to advance FLEET's goals;
- Support Associate Investigators and approaches that have promise for incorporation into FLEET or into a future Centre of Excellence funding bid; and

- Increase diversity in FLEET.

Milestone 2.2.4 Promote equity in leadership roles in FLEET: additional female investigators, consider diversity when FLEET leadership opportunities arise

The FLEET equity and diversity policy should be considered when carrying out the above strategies. In particular, the current FLEET makeup falls short of the goals for gender equity, i.e. 3 of 20 CIs are female, 1 of 5 Theme Leaders is female, and 1 of 5 Special Governance Committee Chairs is female.

In particular, FLEET will:

- Seek female Partner and Associate Investigators as a way to bring more women into the FLEET research environment;
- Encourage Associate Investigators to apply to the Seed Fund when available;
- Consider diversity when leadership opportunities arise within FLEET; and
- Identify and recruit new female CIs to FLEET.

EQUITY AND DIVERSITY PLAN

FLEET aims to ensure fair policies and workplace practices that comply with the equal opportunities policies at all participating organisations, eliminate all forms of discrimination, and increase diversity among all cohorts of FLEET researchers. The FLEET Equity and Diversity Committee, which has representatives at each node, oversees the implementation of this plan as per the following strategic goals:

4.1 Foster a culture of equity and inclusiveness
The FLEET Equity and Diversity (E&D) Committee will monitor and implement the best practices in equity and diversity across the STEM sector, and will actively work to increase awareness of the gender equity issues (e.g., through encouraging the uptake of the implicit bias test), as well as of broader access and inclusion issues (e.g., promoting and encouraging uptake of the LGBTQIA Allyship training). All new personnel are referred to an online induction package that includes information on FLEET E&D policy and practices. The FLEET website should show a broad range of diversity that closely matches that of its members but also seeks to include representation of minority groups. These include E&D guidelines for all events organised or supported by FLEET.

The Equity and Diversity Committee will monitor levels of satisfaction with equity and diversity culture in FLEET through annual surveys.

Targets:
- More than 30% response rate to annual surveys
- High levels of satisfaction with FLEET workplace culture: >90% agree or strongly agree in annual survey
- 100% compliance of all events organised or supported by FLEET within the E&D guidelines
- All members to complete one hour of education/training in equity, diversity and inclusion annually
- Increased awareness of the Centre's pathways to report unacceptable behaviour, with members of the governance committees receiving appropriate training.

4.2 Increase diversity among all cohorts of researchers
FLEET will work in increase diversity in the Centre by increasing the represenation of members from marginalised groups, including but not limited to gender, race, ethnicity, nationality, sexual orientation, disability status, or other factors.
The folowing Recruitment Strategy is reflected in the FLEET HR Recruitment Policy within the Centre Multi-Institutional Agreement:
- Encourage participation in STEM subjects through

outreach activities overseen by the FLEET Outreach Committee (see Outreach Plan)
- Implement recruitment strategies to attract scientists from under-represented groups at all career stages to FLEET (see Recruitment Policy, Appendix A)
- Offer "Diversity in FLEET" and "Women in FLEET" scholarships and fellowships for outstanding higher-degree research (HDR) students and early-career researchers (ECRs), strategic grants (new AIs)
- Have 50/50 gender-balanced representation on selection panels, where practical, ensure presence of FLEET E&D Committee member on each selection panel;
- Ensure that all members of the selection panel are aware of the implicit bias issues and gender-coded language
- Implement the "50/50 if not then why not" policy for shortlisting (see Recruitment Policy)
- Actively encourage family-friendly work arrangements across FLEET, such as part-time appointments, flexible hours and project sharing.

EQUITY AND DIVERSITY PLAN

Targets:

- 30% women researchers and HDR students across FLEET
- At least two "Diversity in FLEET" scholarships or fellow-ships are offered annually from 2022
- 100% compliance of FLEET HR Recruitment Policy (Appendix A) in all Centre recruitments.

4.3 Establish career support initiatives for women in FLEET and members with caring responsibilities

FLEET aims to create and maintain a working environment that eliminates the conflict between research and family commitments. Career support initiatives for women scientists within FLEET aim to create gender equity in the workplace and retain female scientists. While addressing the gender equity problem, these measures are designed to improve the working environment for researchers of all genders:

- Aim to retain women from marginalised groups after a PhD, e.g., through the Diversity in FLEET and Women in FLEET Fellowships
- Offer strategic support to a project if a leader is on maternity or paternity leave
- Assist with family travel and childcare expenses associ-

ated with a FLEET member attending a conference

- Promote and encourage positive family-friendly working practices across FLEET, such as:
- Flexible working hours
- Focus on the outcomes rather than physical attendance.

Targets:

- Increased retention rates of ECR women in FLEET and science careers beyond FLEET, with retention rates for women to be at least equal to retention rates for men
- Increased participation of FLEET researchers with family/carer's responsibilities in FLEET and/or external events as monitored by attendance and the workshop survey

4.4 Establish a women-specific mentoring network

FLEET offers individual mentoring opportunities for women through matching of mentors and mentees within the mentoring program run by the Education & Training committee (see Education & Training Plan).

To ensure inclusion of women researchers in broader professional networks, FLEET will seek and involve external mentors. In particular, the continued involvement of FLEET researchers in the national Mentoring and Guidance in Careers Workshop (MAGIC) for women ECRs

and the multi-Centre collaboration conference Inclusion in STEM (inSTEM).

Target:

- More than 80% uptake of mentoring opportunities by women in FLEET through individual mentoring arrangements and mentoring workshops.

INDUSTRY ENGAGEMENT PLAN

FLEET aims to deliver tangible outcomes in the development of low energy electronic components, for commercial applications. As such, engagement with industry partners, end-users and entrepreneurs are essential for FLEET members to achieve research translation outcomes.

FLEET's ambitions in industry engagement and achieving IP/commercial outcomes are expressed in the following strategic statements:

- Help FLEET members understand the commercial value of their products and identify the commercial opportunities of their developments
- Work with the Education & Training Committee to offer industry-focused training to FLEET members such as workshops on research impact, entrepreneurship, commercialisation, business acumen, intellectual property (IP) management etc... (see Education and Training Plan)
- Train and nurture PhD students and early career researchers so that they are industry-ready by:
- building ECR's network to help them engage with end-users, offering opportunities for them to attend related industry workshops and meetings
- promoting entrepreneurship: encouraging participation in business plan workshops and competitions, working with ECRs through IP commercialisation process

- Promote engagement with end-users and commercial entities
- Develop strategic industry relationships with a focus on commercial outcomes (see Translation Plan)
- Promote patent publications and close engagement with research and industry divisions at node universities and follow a pro-active approach
- On an annual basis, survey FLEET members' current engagement with industry and their input to who else FLEET should engage with
- Align some specific development activities across FLEET with industrial partners
- Facilitate engagement with industry for supporting future ARC Linkage, NHMRC Development, Acceleration Commercialisation type grants - for many of such grants, universities have to include 25 - 50% of the money and this should be lobbied for. FLEET will also strategically fund seed activities when needed
- Maintain and expand relationships with current industry liaisons
- Access industry liaisons' expertise through FLEET organised workshops, mentoring program and governance committee meetings.

Performance Target	2023
Patents applied	2
Technical briefings presented to targeted industry groups	2
Number of industry engagement workshops held	1
Total number of end-user relationships established	10

EDUCATION AND TRAINING PLAN

FLEET members will be provided with high quality training opportunities so that they become well-rounded researchers so they can be successful in whichever field they choose. These training opportunities are targeted at Early Career Researchers (ECRs), including Higher Degree Research (HDR) students and postdoctorate fellows, but may also be offered to senior members if required.

FLEET defines a well-rounded researcher as one that has a high level of the following knowledge and skills:

- Ability to communicate and engage with varied audiences about their research, its meaning and value. Audiences include specialists in their field, industry, government and the community
- Demonstrated high level knolwedge if their area of specialisation
- Understanding the value of their research to their field of expertise, the goals of the organisation they work with, and its broader societal implications, for example, for the community, education, equity/diversity, funding, Intellectual Property and policy
- Well-developed professional network to help solve problems and build collaborative research efforts
- Training in a broad range of experimental and theoretical techniques and have a high level of awareness of their skill strengths and weaknesses

- Experience in mentoring and teaching

The following strategic goals have been developed to assist FLEET ECR's to become well-rounded researchers:

2.1 Develop the next generation of science leaders through world-class training & mentoring programs

FLEET will provide training above and beyond what is offered at individual universities, by identifying different types of training available or needed, and circulating these around the nodes. Where possible, these training sessions will be aligned with university requirements and counted as professional development hours. In addition to training at individual nodes, high quality training prior to the Annual Workshop will be provided, taking advantage of all ECRs and students being together in the same place at the same time. Courses offered will include research development (such as grant writing skills), and professional development (such as media training). Training in equity and diversity will also be provided. Training that provides skills for members that will increase their employability will be provided, targeting skills desirable within industry.

All Centre members will be invited to participate as a mentee, mentor or both at their induction into FLEET. Mentorloop is used as a platform to facilitate the FLEET programs as it provides:

- tools for matching mentor to mentee
- training resources for both mentor and mentee to embrace engagement
- evaluation tools to measure the effectiveness of the mentoring program

FLEET will offer four mentoring programs to provide our members with the opportunity to increase their understanding of academia, the industry, learn the skills they need to develop to be successful within the STEM sector and extend their professional network. The programs are:

1. FLEET ECR Mentoring
2. FLEET Industry Mentoring
3. FLEET Academic Mentoring
4. Women in FLEET Mentoring

Targets:

- FLEET will offer a minumum of eight development courses in research or professional development, and one workshop in equity and diversity per year. Training programs will be evaluated where possible to determine their relative value to FLEET goals.

- FLEET will partner with EQUS to offer the Ideas Factory, an annual event bringing ECRs together to learn communication skills in pitching and presenting research outcomes, establishing and maintaining collaborations, applying for research funding and grants
- FLEET will leverage the established Summer School program at ANU and the Gordon Godfrey Conference at UNSW, aligning the topic to FLEET research approximately every two years. This will introduce a wider community to FLEET topics, and give ECRs an opportunity to build their knowledge base
- FLEET will continue supporting activities of the Student and ECR working group by:
- Encouraging participation through regular communication
- Allocating an annual budget of $10,000 for the Working Group for activities that aim at:
  - Exchanging research ideas
  - Enhancing scientific skills
  - Exanding professional skills
  - Extending professional and research networks
- All ECRs and HDRs will participate in at least one mentoring program by 2023
- Increased participation of partners, alums and industry representatives as mentors

Addtional initatives to assist staff immediately but also fit within the FLEET Legacy framework, to encourage and prepare Early Career Researchers towards careers outside of academia:

1. Hold "Got PhD, What Next?" panel discussions to explore diverse post-PhD career options in the industry, business, policy and academia, where ECRs and students are exposed to personal stories and experiences to help widen their appreciation of future career options
2. Enable exposure to industry and government events such as the Science meets Parliaments, Science meets Policy Meets Policy Makers and Science meets Business programs organised by Science and Technology Australia and other similar initiatives such as the Australian Science Policy Fellowship Program
3. Enable exposure to role models from FLEET alumni through the "Where are they now?" communication series to explore a diverse range of roles that FLEET graduates and ECRs are currently undertaking in industry, government and other sectors
4. Maintain the FLEET alumni database to follow and understand how FLEET training has helped their career choices and journey.

2.2 Establish Centre Succession planning

Please see Centre Succession Plan

2.3 Facilitate opportunities for research collaboration

Internships of 1-6 months will be offered to PhD students to complete at partner organisations. The Education & Training Committee, together with CIs, will identify potential projects from partners, and determine appropriate HDR students to complete these projects. These can be completed at different stages of the students' candidature, based on university requirements.

Target:

- PhD students should have the opportunity to complete a 1-6 month internship at partner organisations, either nationally or internationally, prior to the completion of their candidature.

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EDUCATION AND TRAINING PLAN

The FLEET Education & Training Committee will offer a grant scheme whereby members, particularly ECRs, will apply for funding to complete training at other institutions. For example, a researcher desiring training on a specific piece of equipment could identify another group working with that equipment. This will be a competitive process that would also provide the ECR an opportunity to practice their grant writing skills and receive feedback.

Target:

- Two grant rounds per year, offering up to a total of $20,000 in total, up to $5,000 per person; whereby members, particularly ECRs, will apply for funding to complete training at other institutions.

2.4 Establish a collaborative culture within the Centre

FLEET will run an annual collaboration survey to identify current collaboration efforts with FLEET partners and external collaborators to help the Centre identify:

- Existing collaborative links within the Centre extended international network
- Future collaborative potentials
- Gaps in the current research capabilities
- Alignment of research interests with collabortors within the FLEET extended network

A regular series of colloquia will be established where ECRs present their research, live-streamed to all nodes and open to participation from the wider FLEET newtork. This FLEET-wide colloquia series will give all members an opportunity to interact with FLEET members from other nodes while learning more about the work going on in other laboratories. Outcomes from the annual survey will assist with planning to ensure identified gaps and opportunities are considered.

Target:

- Up to 10 seminars per year will be facilitated

The Education & Training Committee will offer the opportunity for researchers, particularly HDR students, to visit labs at other nodes for 2 - 5 days for the purpose of determining how these labs run and the work being completed. They will participate in the day to day activities in these labs for this purpose. There may be opportunities for ongoing collaboration.

Target:

All completing PhD students should have completed a 2 - 5 day visit to another lab before their thesis submission.

2.5 Facilitate opportunities for career development in the industry

In addition to facilitating opportunities for research collaboration with partner organisations (2.3), FLEET will also support career development in the industry by:

- Capitalising on established programs such asthe Australian Postgraduate Research Intern (APR Intern) for internship opportunities with local industry and encouraging industry partners and stakeholders to offer internships thorugh such programs. FLEET students and ECR's are regularly informed of opportunities available via the FLEET opportunities webpage and monthly newsletters
- Engaging with local industry to explore internship arrangements for our students and ECRs, starting with Silanna Semiconductor and industry collaborators we're working with through Linkage projects. FLEET will work to expand its network of local industry partners to develop new opportunities.

FLEET is committed to science outreach to further public awareness of science and its growing role in society, and to contribute to building a STEM-proficient workforce, achieved by increasing the number of students (particularly members from marginalised groups) undertaking STEM at senior secondary and tertiary levels. FLEET will connect with school students, teachers and the public, seeking out opportunities to inspire a passion for science and awareness of FLEET research to students and the wider community.

Audience: FLEET outreach is aimed at school students, teachers and the broader public. This may also include more specialised groups such as industry, government, NGOs, etc.

FLEET Members: FLEET members are required to complete a minimum of 20 hours per year. This will take a number of forms, including presenting to the public, organising events, designing and developing educational resources, etc. FLEET members will be supported in this and will be provided with training in ways to deliver outreach. FLEET prizes for outstanding efforts in outreach will be awarded as an incentive to members.

The following strategic goals have been developed for FLEET outreach activities:

5.1 Contribute to the scientific literacy and understanding of FLEET science amongst primary and secondary students, and teachers.

FLEET will achieve the following goals:
- Aid primary and secondary school teachers to teach physics by developing a set ofcurriculum-linked teacher resources linked to FLEET research.
- Via the Future Electronics unit delivered at John Monash Science School (JMSS), affect how students value physics and the physical sciences and their participation in STEM subjects in senior high school and through to university
- Reach students from regional and/or disadvantaged schools and have an impact on students' scientific literacy and critical thinking about FLEET research.

Targets:
- Develop at least three resources that includes demonstrations, teaching aids, teacher professional development workshops, classroom lessons and hands-on activities for Australian schools. Ensure such resources are also targeted at engaging marginalised students in STEM
- Develop and conduct at least three physics- and chemistry-based workshops for primary and secondary students

- Deliver 20 online and in-person workshops in 2023 for primary and secondary students with a focus on the years 3-9
- Further develop the pilot Year 10 science elective unit at JMSS and implement it, in whole or in part, at a minimum of one other school by 2023
- Target indigenous, regional and/or disadvantaged schools. Pilot an adapted version of the JMSS unit in at least one indigenous or disadvantaged school
- Develop relationships with schools through STEM Professionals in Schools to enable FLEET staff to gain experience in communication and engagement. Enlist at least 15 FLEET participants in the STEM Professionals in schools program
- Develop relationships with at least one Specialist Science Centre such as Quantum Victoria and Monash Tech School to collaborate on the development and delivery of physics-based units for primary and secondary students.

Measuring Impact:

1. Conduct pre- and post-evaluation of each FLEET interaction through workshops and the JMSS Future Electronics unit to assess the effect of FLEET interactions on literacy, perception and understanding of science, its process and value, especially in physics

2. Continue to conduct the longitudinal studies with JMSS to understand the effect of the unit on literacy and participation in STEM.

5.2 To raise awareness of FLEET research among the general public

Awareness of FLEET research has the following measurable objectives:

- An appreciation/understanding of the purpose and value of FLEET research and physics generally
- An awareness and understanding of the scientific process (or method of enquiry)
- Ability to think critically about the implications of FLEET's research and science on society and where meaning is constructed through dialogue with FLEET researchers and staff.

Targets:

FLEET will conduct the following engagement activities to meet and measure these objectives:

- Continue to use and develop interactive activities to engage the public in FLEET science at public events such as Melbourne Knowledge Week, National Science Quiz and Science in the City. FLEET will participate in at least two public events in 2023.
- Conduct in-person and online public tours of FLEET labs during events such as Open Days and similar opportunities for incursion. FLEET will conduct at least seven public tours in 2023
- Develop online and in-person talks targeted at interested community groups such as Rotary Clubs. FLEET will participate in four presentations to the community in 2023
- Support/train FLEET researchers in communication and public engagement skills to broaden their transferable skills and enable more effective engagement with FLEET audiences. FLEET will conduct at least two training events for FLEET members to help improve their communication skills
- Create greater depth to the content of the online activities to broaden the audience reach and also target specific audiences such as teachers and students. Promote the activities and associated content through student and teacher networks.

Measuring Impact:

1. FLEET will develop methods to evaluate each public outreach activity to measure awareness of FLEET research. These can be integrated into the interactive activities or operate as distinct entities, e.g. short surveys

2. FLEET will monitor the metrics to the relevant web pages and social media used as platforms to reach wider audiences and engage them in FLEET research and with researchers. Such metrics should indicate an increase in visits to the new pages and posts, and where there are opportunities for engagement, FLEET will evaluate such engagement to assess awareness, critical thinking and dialogue around value and appreciation of FLEET research.

COMMUNICATIONS PLAN

FLEET's communications plan aims to facilitate internal and external communication to support the Centre's strategic goals:

6.1 Support Centre strategic priorities through internal communication

FLEET will use internal communication tools such as an internal monthly e-newsletter to reinforce Centre cohesiveness and collaboration between nodes and disciplines. This will support the following priorities:

2.1 Develop world-class training & mentoring programs

2.4 Establish a collaborative culture within the Centre

4.1 Foster a culture of equity and inclusiveness.

Target:

* Maintain high member engagement in monthly e-newsletters - measured by number of opens at minimum 50%.

6.2 Communication to science/research community

Using stakeholders' newsletter, social media, briefings, research articles on key online science platforms and science media to raise awareness of FLEET research and discoveries, increasing opportunities for collaboration and raising profile of FLEET researchers. This will also include engagement with thought leaders in semiconductors, "beyond CMOS", ICT energy technologies.

The following priorities will be supported:

3.1 Establish international partnerships

3.2 Establish links to industry and end users

Targets:

* Number of research stories, to be maintained at 15 for future years

* Grow total newsletter audience to 410 by the end of 2022 and increasing 5% annually.

6.3 Promote FLEET research and scientific literacy to the public

Using social media and mainstream media to raise awareness of the background to FLEET research (namely, ICT energy use), societal value, and the research undertaken at FLEET. More widely, reinforcing the value of fundamental and applied science, and increasing science literacy. Supported by accessible content on website, research and other news stories. The following priorities will be supported:

5.1 Promote a sustained understanding of FLEET's work

5.2 Develop the scientific literacy of Australia

Targets:

* Increase social media audience on each priority channel: 1440 on Twitter by end of 2022 and increasing 15% annually. 770 on Facebook by end of 2022 and

increasing 10% annually.

* Increase vision of FLEET research in all media channels: at least 300 mentions per year

* Feature FLEET work in mainstream ("old media") channels: at least 10 opportunities per year.

6.4 Engage with key partners

FLEET will continually engage with key partners including the ARC, the Government, participating nodes and collaborators through research stories, stakeholders' newsletters and social media. This will include communicataion of cutting-edge research and scientific/societal discoveres. All communications will demonstrate FLEET's collaborative way of working, and the Centre's commitment to science leadership, including development, equity and STEM literacy to support the following goals:

3.2 Establish links to industry and end users

5.2 To raise awareness of FLEET research among the general public

Targets:

* Opportunities for members to give NGO and government briefings: at least 4 annually

* Opportunities for members to present their work at public forums: at least 30 public presentations annually.

6.5 Empower FLEET members to communicate their scientific work

Provide skills training, incentives, resources in order for FLEET members to communicate their own research, developing future science leaders and improving authenticity of communications to support the goal:

2. Developing next generation of scientific leaders

Targets:

- Publish at least 10 non-peer reviewed articles annually
- Encourage members and affiliates to engage on social media platforms: at least 55 members sharing their science on social media by end of 2022 and increasing by 5% annually
- Encourage participation of ECR and student members in Three-Minute Thesis, FameLab, Science in the Pub and similar: at least 2 annually.

6.6 Push the boundaries of what we're doing in communications, seeking and championing communications "best practice"

FLEET will build centre cohesion to seek and champion "best practice" communications including online communication, webinars, training, community building and collaboration. This will be achieved through researching and investing in new digital tools and techniques, and engaging with the public, science community and businesses to share communication insights

Target:

- At least 2 new initiatives each year.

All recruitments must follow FLEET's Equity and Diversity Guidelines. If chief investigators intend to recruit or appoint a FLEET postdoctoral fellow, they must first notify FLEET Chief Operating Officer with the following information: Supervisor(s) of postdoctoral fellow, node where fellow will be appointed, FLEET project the fellow will be responsible for, and FLEET fund supporting the fellow.

When recruiting and employing personnel, the recruiting organisation will ensure the following conditions are met:

a. Selection panels will include representation from the FLEET Equity committee.
b. All members of the selection panel should be aware of implicit bias issues. The FLEET Equity committee will develop an appropriate training module on implicit bias suitable for selection panel members in cases where such training is not already available through the participating organisation.
c. Selection panels should endeavour to produce shortlists with equal representation of women and men. In cases where this is not possible, a justification must be provided to the Equity committee.
d. Induction for new personnel will include online induction modules that will promote awareness of gender equity issues (e.g., the Implicit Bias test), as well as broader access and inclusion issues (e.g., LGBTIQA allyship training).
e. FLEET actively encourages the family-friendly work arrangements such as part-time appointments or project sharing

Direct And Partial Appointments

- Direct appointment of FLEET postdoctoral fellows without a competitive search is strongly discouraged. If CIs wish to appoint a postdoctoral fellow by direct appointment, they must first seek approval of the FLEET Executive Committee.
- Partial appointment of postdoctoral fellows (to work part-time for FLEET and part-time for another project) is discouraged. If CIs wish to appoint a postdoctoral fellow to partially to FLEET, they must seek approval of the FLEET Executive Committee.

Failure to comply with FLEET's rules for recruitment as established by the Executive Committee is a breach of FLEET's multi-institutional agreement, and FLEET will take appropriate action up to and including withholding of funding.

Centre Acknowledgement in Position Descriptions

When recruiting personnel funded by the Centre including, but not limited to, administrative staff, research staff and students, the recruiting organisation must ensure that the following acknowledgement is included in the Position Description.

"The ARC CoE in Future Low-Energy Electronics Technologies (FLEET) is an international innovator in novel electronics technologies. Enabled by the new science of atomically thin materials, FLEET brings together over 40 world-leading experts to develop a new generation of ultra-low power devices. Headquartered at Monash University, the FLEET network comprises of 20 chief investigators at seven Australian institutions, >20 partner investigators at 18 institutions worldwide, and over 120 HDR students and postdoctoral fellows. The team is highly interdisci-plinary with high-profile researchers from atomic physics, condensed matter physics, materials science, electronics, nanofabrication and atomically thin materials.

With over $40M investment from the ARC and contrib-uting organisations, FLEET is poised to make significant global impact in the electronics and energy sectors. By building strategic and strong partnerships with Australian and international industry, research institutions and government, FLEET aims to build capacity for advanced electronics research in Australia and train the workforce for the next generation of electronic materials researchers and future semiconductor industry. To learn more about FLEET, please visit our website: fleet.org.au.

At FLEET, we are committed to gender equity. Our goal is to achieve at least 30% women researchers and higher degree by research (HDR) students across FLEET. Please visit fleet.org.au/equity to learn more.

We are also passionate about building future leaders in the field. All of our early career researchers and HDR students will take part in a comprehensive training program incorporating excellent supervision and professional development. To learn more about benefits of working with us, please visit fleet.org.au/collaborate.

APPENDIX B: FLEET EVENT GUIDELINES

An event supported and/or organised by FLEET has to ensure that it is sufficiently diverse, inclusive, and complies with the FLEET gender equity policy and targets. These guidelines aim to assist the organising committees for such events in designing their event's Equity and Diversity policy.

The guidelines are non-rigid: a committee does not have to do 100% but has to demonstrate a genuine effort in order to obtain FLEET support and/or funding. In the event that the guidelines are not taken into consideration, the FLEET support and/or funding will not be provided.

Members of FLEET invited to speak at or serve on committees for externally organised events are strongly encouraged to promote the use of these guidelines.

The following resources (and references therein) were used in preparing these guidelines:
ncbi.nlm.nih.gov/pmc/articles/PMC4238945
cubistcrystal.wordpress.com/2016/12/09/show-me-the-policy-part-2

EQUITY AND DIVERSITY (E & D) GUIDELINES FOR FLEET-SUPPORTED* EVENTS

1. The composition of the organising committee should comply with the "50/50 and if not then why not" rule.
2. The organising committee should have at least one member of FLEET E&D committee in the "E&D Champion" role.
3. As part of application for FLEET support/funding, the organising committee should formulate an E&D strategy and policy for the event and submit it to the FLEET E&D committee. The policy should be made public on the event's website.
4. The organising committee should identify the baseline representation of female researchers in the particular field of research and aim to have at least the base rate representation on the list of invited speakers.
5. The committee should consider 50/50 gender balanced list of plenary speakers (as opposed to invited speakers), which is more easily achieved.
6. The committee should compose a list of invited female speakers well in advance, allow for significant redundancy, invite them first, and not replace with male speakers if they pull out.

7. The committee should recognise that, given that gender balance currently declines significantly with seniority, a more equal balance in the future can only be achieved if female ECRs are invited in greater numbers.
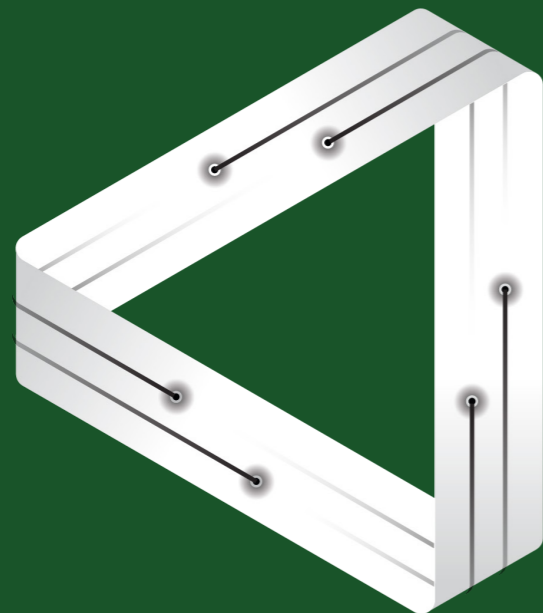8. The committee should carefully consider the costs of travel to location, venue hire, and social events. The funds saved, e.g. by staying away from luxury resorts in isolated locations, should be redirected to make the event family-friendly.
9. The event should offer childcare and travel assistance to families, which will enable more women (and other primary carers) to attend.
10. The location should be family-friendly (i.e. have a family room, childcare/activities on-site) and social events should be inclusive.

* 'Support' means sponsorship, full or partial funding, co-branding, or significant participation of FLEET members.

FLEET

ARC CENTRE OF EXCELLENCE IN FUTURE LOW-ENERGY ELECTRONICS TECHNOLOGIES