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# Achieving our Goals in a Changing Research Landscape

David Coutts, Associate Dean, Research,  
Faculty of Science and Engineering



# Outline

## Research Highlights

### Context for Research:

Macquarie University,

Faculty of Science and Engineering

A changing research landscape

### Support for Research in the Faculty of Science and Engineering

# Research Highlights

Major achievements over the last ~ 12 months

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**ARC Training Centre for Fruit Fly Biosecurity** opened 27 June 2017

**Fellowships:** Darrel Kemp, 2017 ARC Future Fellow,  
6 ARC DECRA Fellows 2 CSIRO Future Science Fellows

**Grants:** 11 ARC Discovery, 1 ARC Linkage, 3 Citizen Science, 3 NHMRC Project Grants.

**Four new/renewed Macquarie University Research Centres:**

Species Spectrum Research Centre • Centre for Green Cities • Centre for Astronomy, Astrophysics and Astrophotonics • Biomolecular Discovery and Design Research Centre.

**Grant submissions 2016/17:**

DP18: 66 submitted, DECRA: 31 submitted, 5 FSE led ARC LIEF Grants.

NHMRC: 5 project, 2 Career Dev. Fellowships, 1 EC Fellowship submissions

**Articles:** Since Jan 2016: 15 Articles in *Science* and *Nature*

# Research Highlights

## Game-changing major success stories



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### \$10M INITIATIVE TO CHANGE THE WAY WE GREEN PUBLIC SPACES

1 JULY 2016

A future where landscapers, local councils and developers can quickly determine the best plant species to establish for longevity, in the face of climate change and

### \$20.5 MILLION TOWARDS QUEENSLAND FRUIT FLY BIOSECURITY RESEARCH AND DEVELOPMENT

9 JULY 2015

A landmark research co-investment of \$20.5 million has been agreed between Macquarie University and Horticulture Innovation Australia focusing on the management of Queensland fruit fly (Qfly) through Sterile Insect Technique (SIT).

A research team lead by Associate Professor Phil Taylor will focus on developing an effective SIT program to curb the prevalence of fruit flies in Australia. The team hopes to parallel the successful area-wide SIT programs that have been implemented to control other fruit fly species overseas. The funding was provided through Horticulture Innovation Australia, with co-investment by Macquarie University.





# Research Highlights

## Recent researcher honours



Assoc  
Prof  
Carlo

Winn  
2017  
Medal  
Austr  
Acade  
Scien

### Faculty support:

- Identifying opportunities
- Encouraging people to nominate
- External experts to help you prepare nominations for prizes and awards

**scienceinpublic**

- 19 nominations so far this year
- Celebrating your success

Dr Simon Gross

Named as one of ten honourees of the MIT Technology Review Innovators Under 35 competition for Southeast Asia, Australia, New Zealand and Taiwan



# Macquarie in Context



University rankings based on research

	ARWU# 2015	ARWU# 2016	Leiden@ 2015	Leiden@ 2016	Leiden@ 2017
<b>U of Adelaide</b>	170	139	246	201	182
<b>UTS</b>	385	366	162	538	510
<b>Macquarie University</b>	<b>231</b>	<b>206</b>	<b>309</b>	<b>431</b>	<b>423</b>
<b>U of Wollongong</b>	261	330	337	411	405
<b>U of Newcastle</b>	341	350	223	235	371
<b>QUT</b>	485	297	384	368	364
<b>Deakin</b>	393	214	474	428	383
<b>Curtin</b>	271	212	278	370	355
<b>University of South Australia</b>			518	492	478

# ARWU Calculated by MQ Analytics

@ World Ranking Using total publication (P)

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It is important to be in the top 200

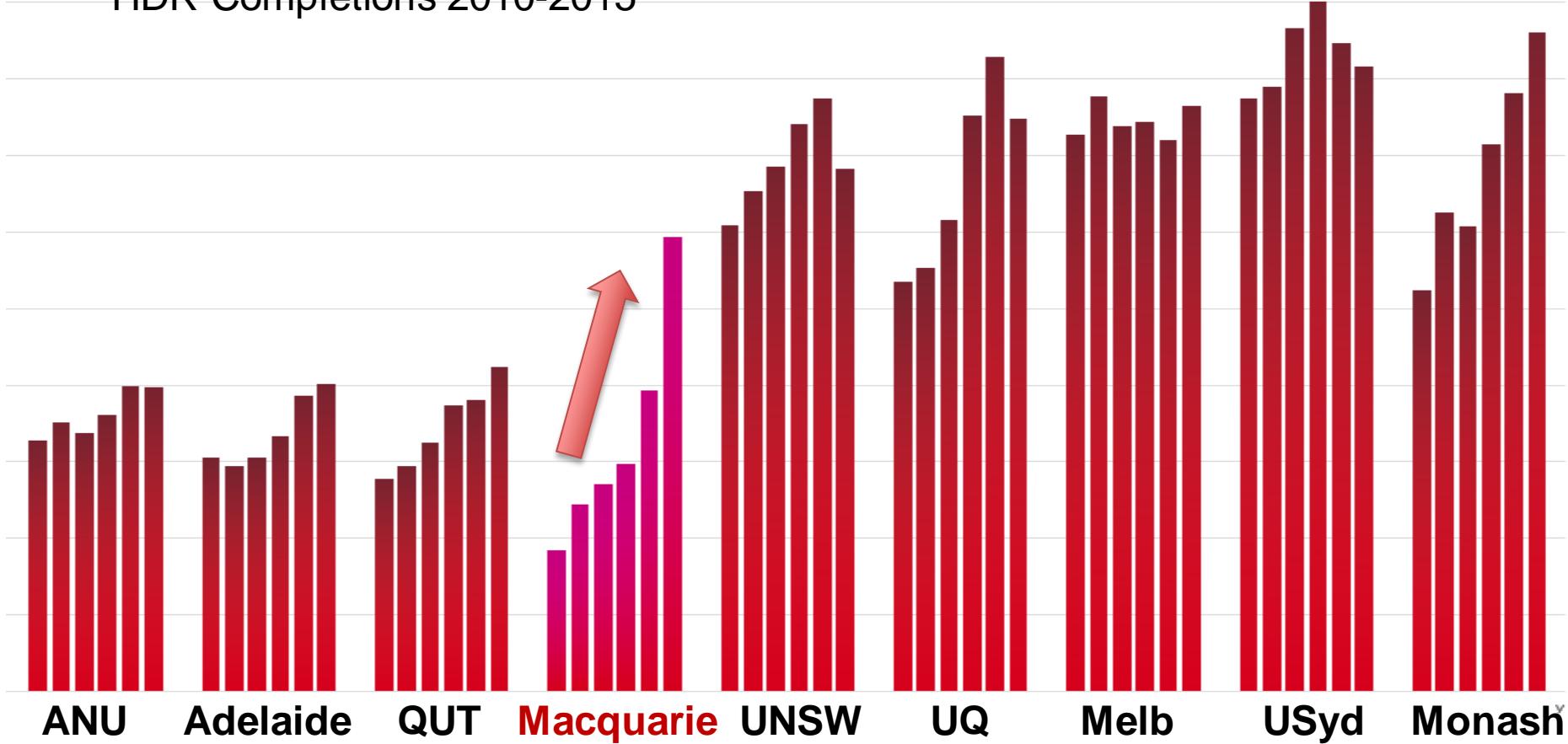


# Macquarie in Context



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HDR Completions 2010-2015



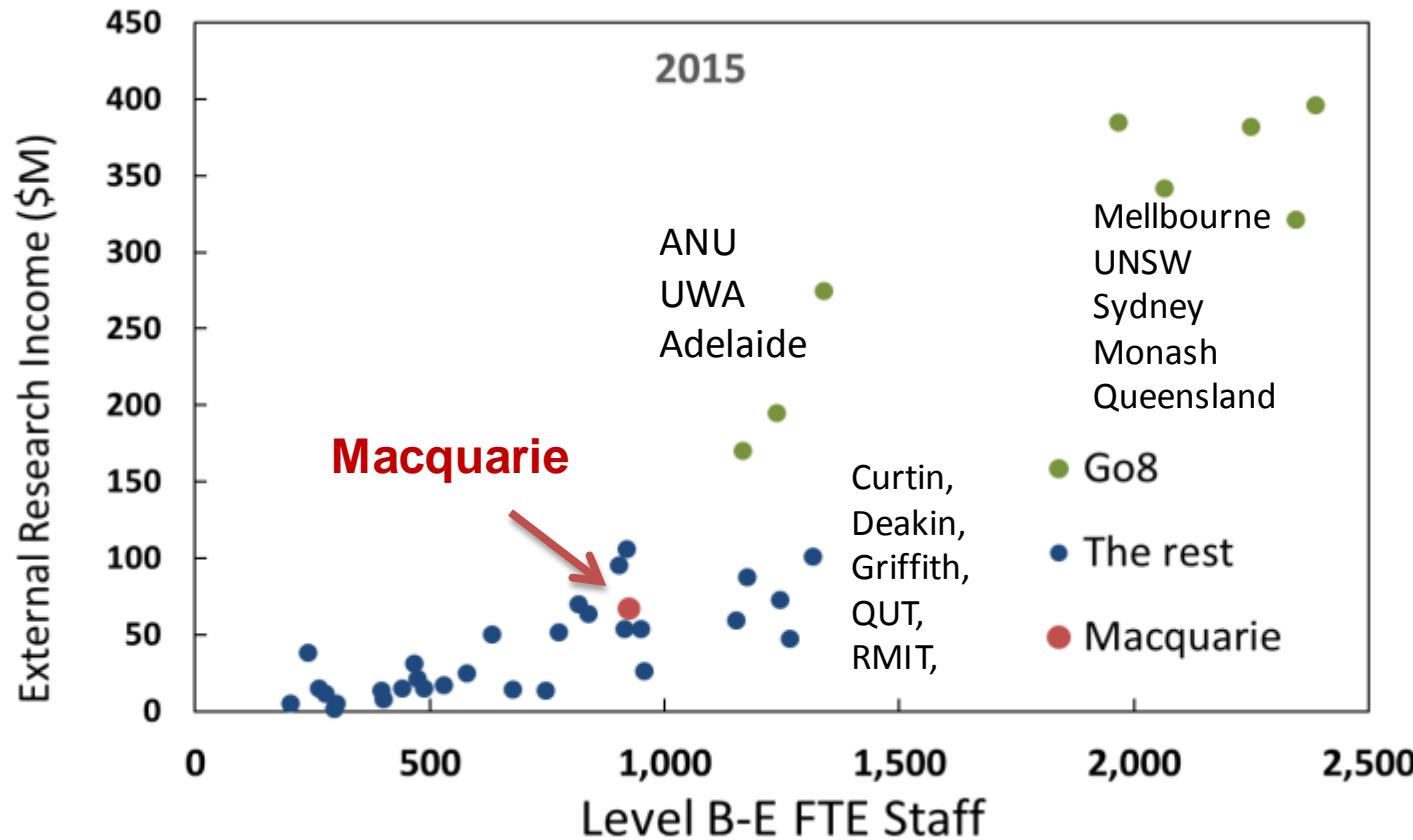


# Macquarie in Context



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## Australian Universities Research Income Landscape

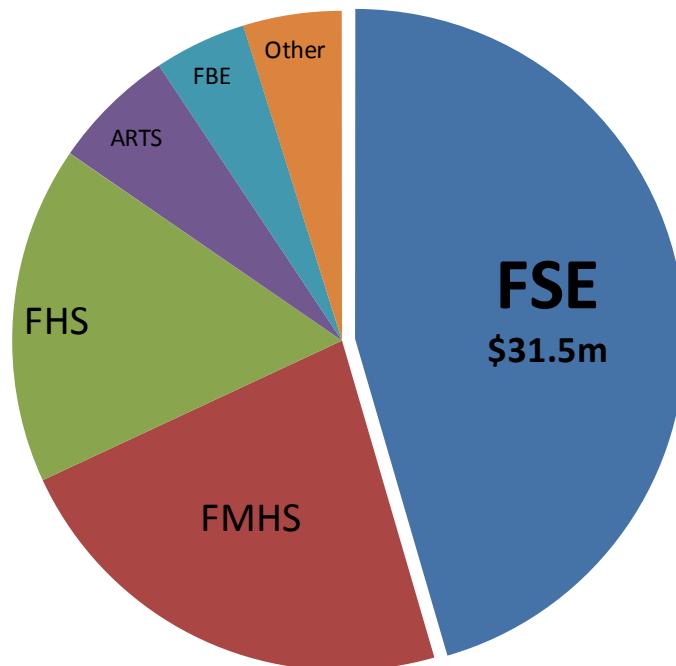




# Importance of STEM

Reputation and Rankings rely heavily on STEM disciplines

2016 External HERDC Income  
Breakdown by Faculty





# Frameworks & Strategies



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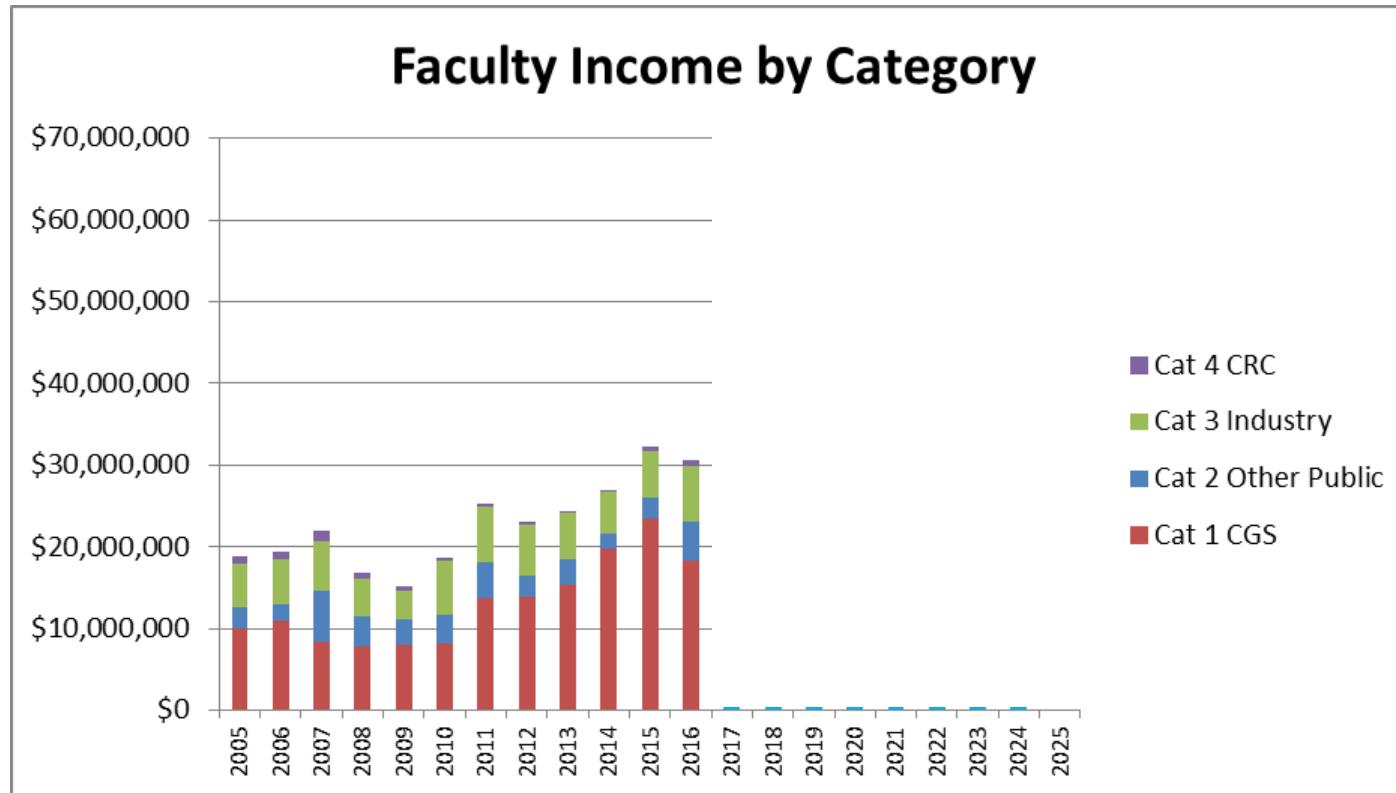


# Faculty of Science and Engineering



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Research Income (HERDC by Category) – 2005-2016





# Building Capacity in FSE

## New Academic Staff

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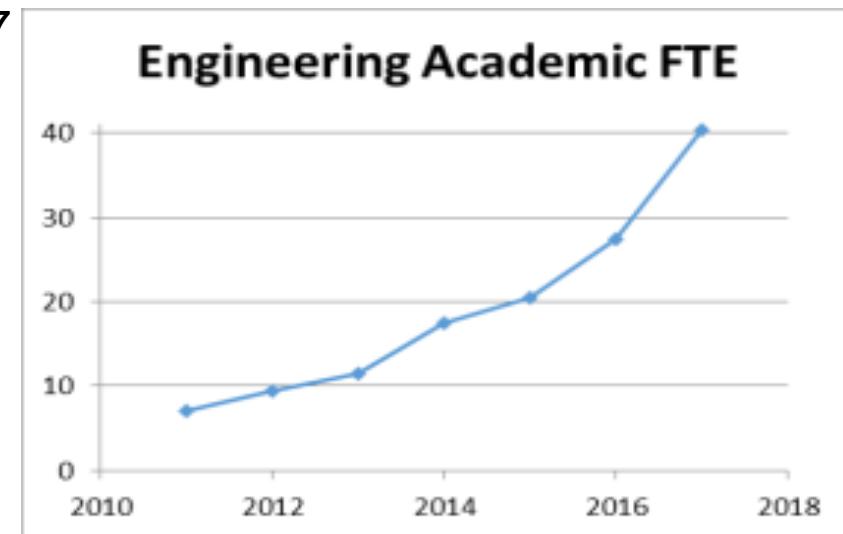
Over 10 new continuing academics recruited in the last ~12 months

Six Professors: Sheng, Mukhopadhyay, French, Bagnall, Rodgers, Skidmore (50%)

Engineering growing very rapidly:

+3 in 2015, +7 in 2016 and up to +13 in 2017

Attracting external fellows to relocate to MQ  
(DECRA Fellows, Future Fellows)





# Challenges and Opportunities

How can I get funding for my research?

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Funding for postdocs

Funding for HDR students (Scholarships)

Funding for new equipment

Funding for travel (conferences, field trips)

Funding for project costs

Everyone is very busy...

What are the external funding opportunities?

(Internal schemes are now geared towards seeding external opportunities)

# Changing Landscape





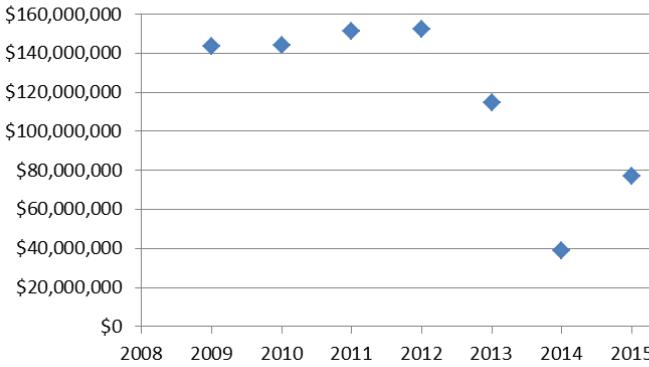
# The Changing Landscape

## Traditional ARC Funding

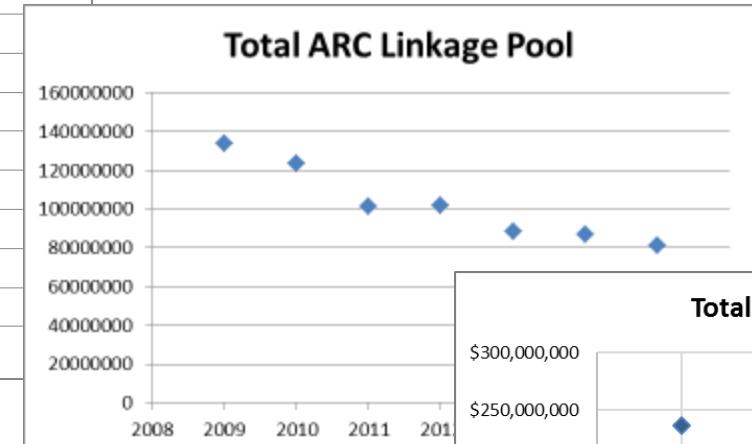


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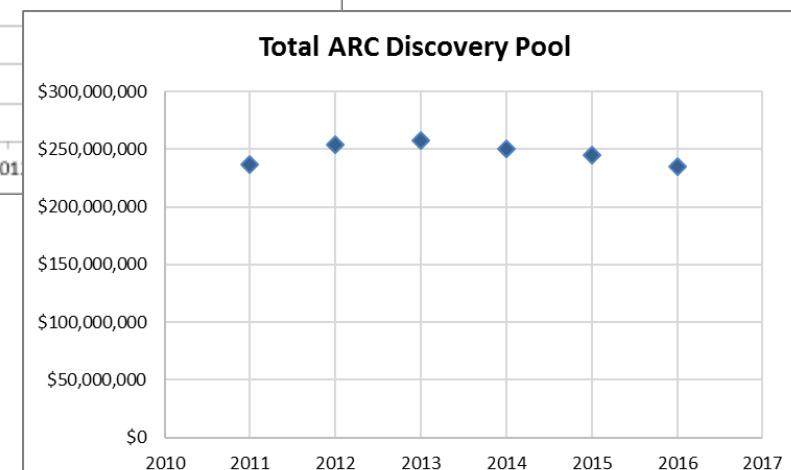
**Total ARC Future Fellowship Pool**



**Total ARC Linkage Pool**



**Total ARC Discovery Pool**



Replaced by new opportunities



# The Changing Landscape

## Traditional ARC Funding



Total

\$160,000,000  
\$140,000,000  
\$120,000,000  
\$100,000,000  
\$80,000,000  
\$60,000,000  
\$40,000,000  
\$20,000,000  
\$0

2008

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## Faculty Support:

- External consultants to provide expert feedback on draft research proposals
- FSE Safety-Net to complement MQ Safety-Net





# The Changing Landscape

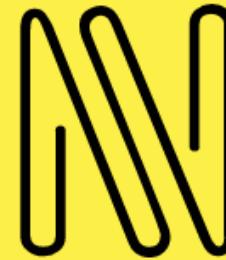
More directed research funding, more partner engagement



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**Australian Government**



**NATIONAL  
INNOVATION &  
SCIENCE AGENDA**

\$1.1B over 4 years



**Australian Government**  
Department of Industry,  
Innovation and Science

**Industry  
Growth  
Centres**



# The Changing Landscape

More directed research funding, more partner engagement



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**Industry Growth Centres:** \$250M over four years



Advanced Manufacturing



Cyber Security

Australian Cyber Security Growth Network



Food and Agribusiness



Medical Technologies and Pharmaceuticals



Mining Equipment, Technology and Services



Oil, Gas and Energy Resources.



In part to: *Improve engagement between research and industry*



# The Changing Landscape

More directed research funding, more partner engagement



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Cyber Security • Enhanced human performance  
Quantum • Space • Materials,  
Medical countermeasures • Autonomous systems  
Integrated surveillance and reconnaissance  
Advanced sensors, hypersonics & directed energy

\$730M Next Generation Technologies Fund over 10 years:

- Grand Challenges Program
- Defence Cooperative Research Centres
- Strategic Research Projects...

Macquarie is a member of the Defence Science Partnerships program



# The Changing Landscape

More directed research funding, more partner engagement

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Smart Cities Plan (\$50M): includes Smart Technology



CSIRO Synthetic Biology: Future Science Fellowships

Inspiring Australia Science Engagement Program: Citizen Science Grants



New opportunities on our doorstep

- Macquarie Park Innovation District (MPID)





# Navigating the Opportunities

Finding and Creating Opportunities

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Read ***Research Matters*** fortnightly newsletter  
read the spreadsheet list of opportunities

**Research Matters**  
**Vol. 23. No. 01**

**Subscribe to funding opportunity services:**

**Research Professional** - alerts that match your interests:  
[www.researchprofessional.com](http://www.researchprofessional.com)

\* **Research** Professional

**Nine Sigma** – industry problems  
[www.ninesigma.com](http://www.ninesigma.com)





# Navigating the Opportunities

Finding and Creating Opportunities

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## Build your network

Attend meetings & workshops that bridge to industry/defence/government  
apply for a FSE Visiting Research Fellowship grant

## Build your public profile

Log on to PURE via the Research Hub ([staff.mq.edu.au/research/research-hub](http://staff.mq.edu.au/research/research-hub))  
and update your profile

## Help us to promote you

Tell us your good news stories, use social media (@MQSciEng), apply for  
prizes and awards



# Navigating the Opportunities

Responding to Opportunities

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## “Sandpit” events – cross-Departmental/Faculty collaborations

Fluid mechanics (2016)

Imaging, Smart Cities, 3d-printing, *what would you like to see?*

## FSE Partnership Clinics - Targeting Category 2, 3, 4 Grants

Mike Heimlich: AD Industry and Corporate Engagement

Mark Berlage: Research Partnerships Manager – FSE

*make an appointment!*

## Support with developing proposals:

Expert consultants to review draft proposals (not just ARC Discovery)



# Navigating the Opportunities

## Responding to Opportunities

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### Supporting open Linkages

- 3 internal rounds for easy support – aligned to academic calendar
- Safety-net scheme for Linkage

### Internal grants for engaging with end-users:

Partnership Seeding Grants (match dollar for dollar up to \$50k)

Industry co-Funded Fellowships (2-3 years, at least 50% industry funded)

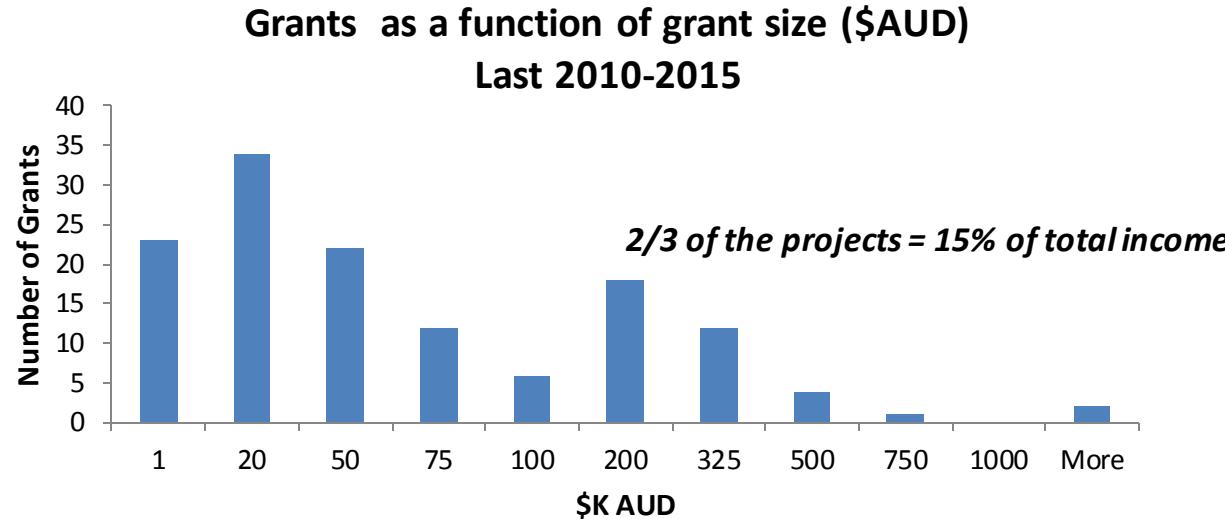
### Excellent resources on MQ Research Partnerships web pages

**Funding, fellowships and partnerships**



# A Streamlined Process

Optimising our ability to partner with industry / end-users



Research Office ***Rapid Improvement Exercise*** with FSE – outcomes:

- Keep Cat-1 processes the same
- Fast-track: Low-touch with standardized template
- Customized: complex funding- and IP-related projects



# Navigating the Opportunities



## Other initiatives

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- Engagement with MPs and government ministry
- Industry Growth Centre memberships and dialogue
- Building relationships with DST Group
- Developing international partnerships: delegations
  - Europe, Japan, China (including via AusTrade, DFAT)
- Building major partnerships with industry:
  - Optus Macquarie Cyber Security Hub
  - Thermo Fisher Scientific
- Strategic approach to Centres of Excellence



# Entrepreneurship Opportunities

Impact through entrepreneurship



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Macquarie University Incubator

- Pop-up Incubator (E3B 114)
- New building nearly ready



CSIRO

- On-Prime
- On-Accelerator
- FLEDGE (MedTech)



Other Accelerators

- MedTech Actuator
- Innov8

## Incorporating entrepreneurship into PhD and UG programs

# Summary

The landscape for supporting research in Australia has changed  
New challenges, and new opportunities!

Many opportunities require partnering – multi-institutional and/or with industry  
Lots of support to help you take advantage of new opportunities  
FSE is working hard to build success – we need you to seize the new opportunities

Your FSE team is there to help!

David Coutts, ADR, Mike Heimlich AD ICE, Ian Wright Deputy ADR  
Irina Zakoshanski FRM, Cathi Humphrey-Hood, Katherine Shevelev  
Mark Berlage – Research Partnerships Manager, Science and Engineering