Australian Research Integrity in the Asian Century

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Outline

- Recent changes to research integrity in Australia

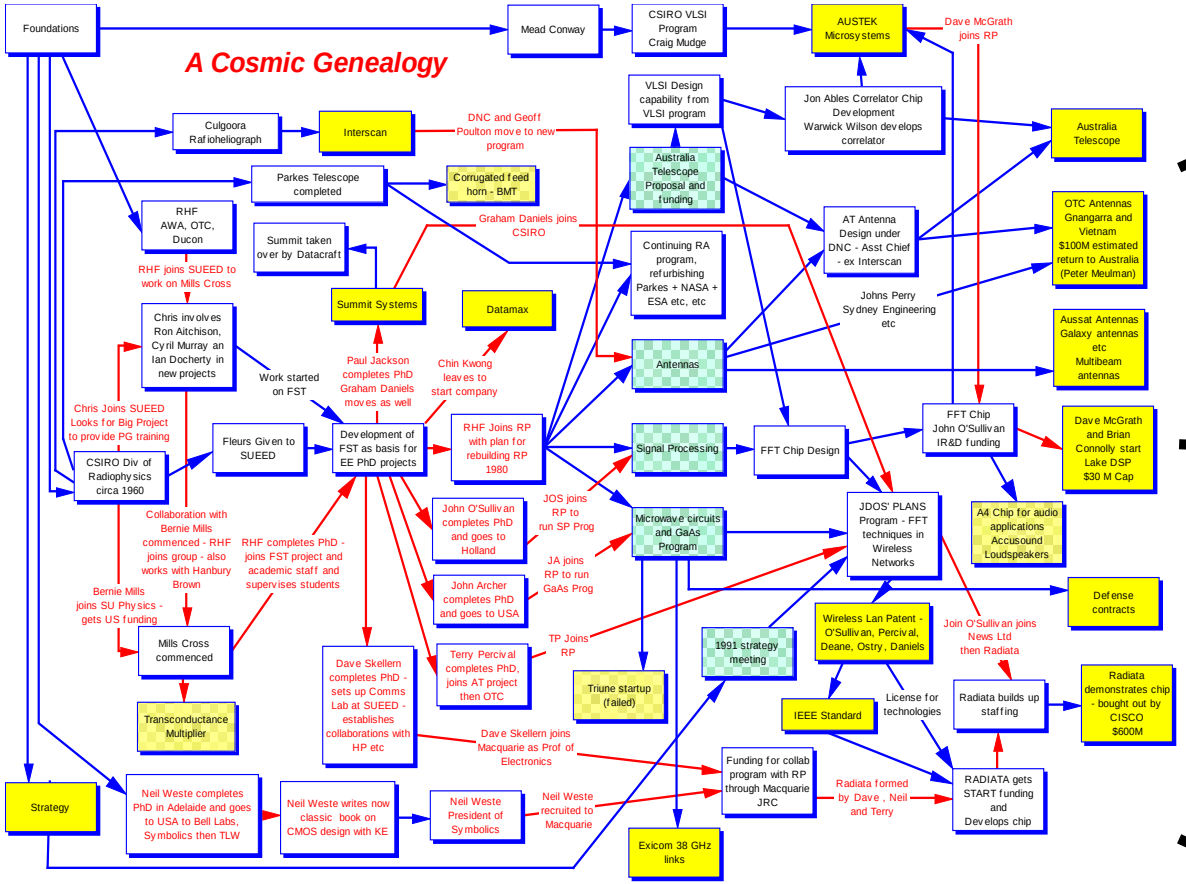
- Towards an Asia and Asia-Pacific research integrity exchange program
  - *Harmonisation of research integrity initiatives in Asia and Asia-Pacific*
  - *Positive impacts of small research integrity networks*
  - *Targets for exchange*

Key terms

- *Research*
  - Systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions
- *Research integrity*
  - Usually a set of principles and responsibilities to guide research such that the process and products of the research can be trusted
    - *Integrity of the research process*
    - *Integrity of research itself*
- *Research ethics*
  - A framework that allows for assessment of research proposals that intended to protect participants or animals. Research can be approved if the risks faced by participants or the welfare impacts on animals are outweighed by potential benefits

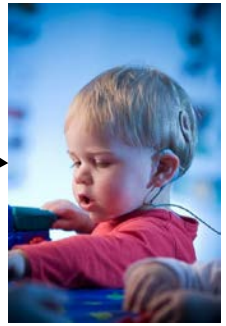
Research is predictably unpredictable

Allied Forces WWII radar



Credit: Dr Bob Frater AO FAA FTSE

Radioastronomy



Cochlear implant

Cat videos on smartphones

Why does research integrity matter?

- Research always has impact
- The impact of research is predictably unpredictable
- *Because of this we must be able to trust research*

- Research integrity makes research trustworthy and excellent

- *Research integrity also:*
  - *Underpins the positive impact of research*
  - *Is the norm*

The principles of research integrity are

- **Honesty** and **accountability** in all aspects of research.
- **Professional courtesy** and **fairness** in working with others.
- **Good stewardship** of research on behalf of others.

The Singapore Statement on Research Integrity

The principles of research integrity are translated into practice by humans (researchers) working in a complex system of expectations and traditions

- *Moral compass*
- *Personality traits*
- *Cultural background*
- *Skills and experience*
- *Education and training*
- *Mentoring and supervision*
- *Research discipline or area*
- *Local settings for research*
- *Institution*
- *Funding source and regulation*
- *Publisher*

Adherence to regulation

Working safely

Demonstration of respect for participants, animals, environment

Rigour and objectivity

Scholarly writing

Management of research data

Sharing research data

Publication and communication of research

Citation of the work of others

Acknowledgment of contributions to research

Authorship

Peer review

Conflict of interest management

Supervision and mentorship of research trainees

Research integrity education and training

Accuracy in research proposals

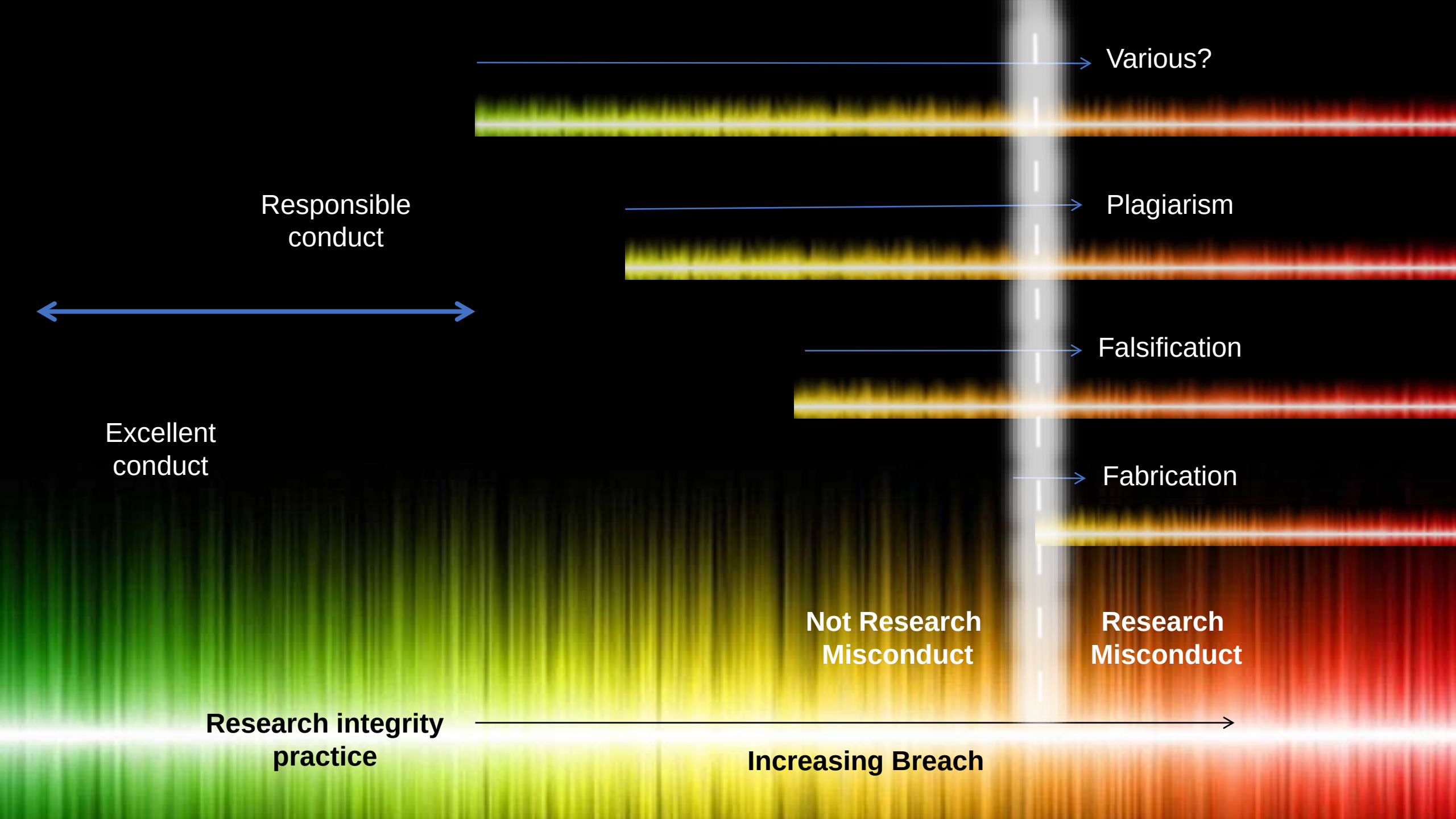
Use of research funds

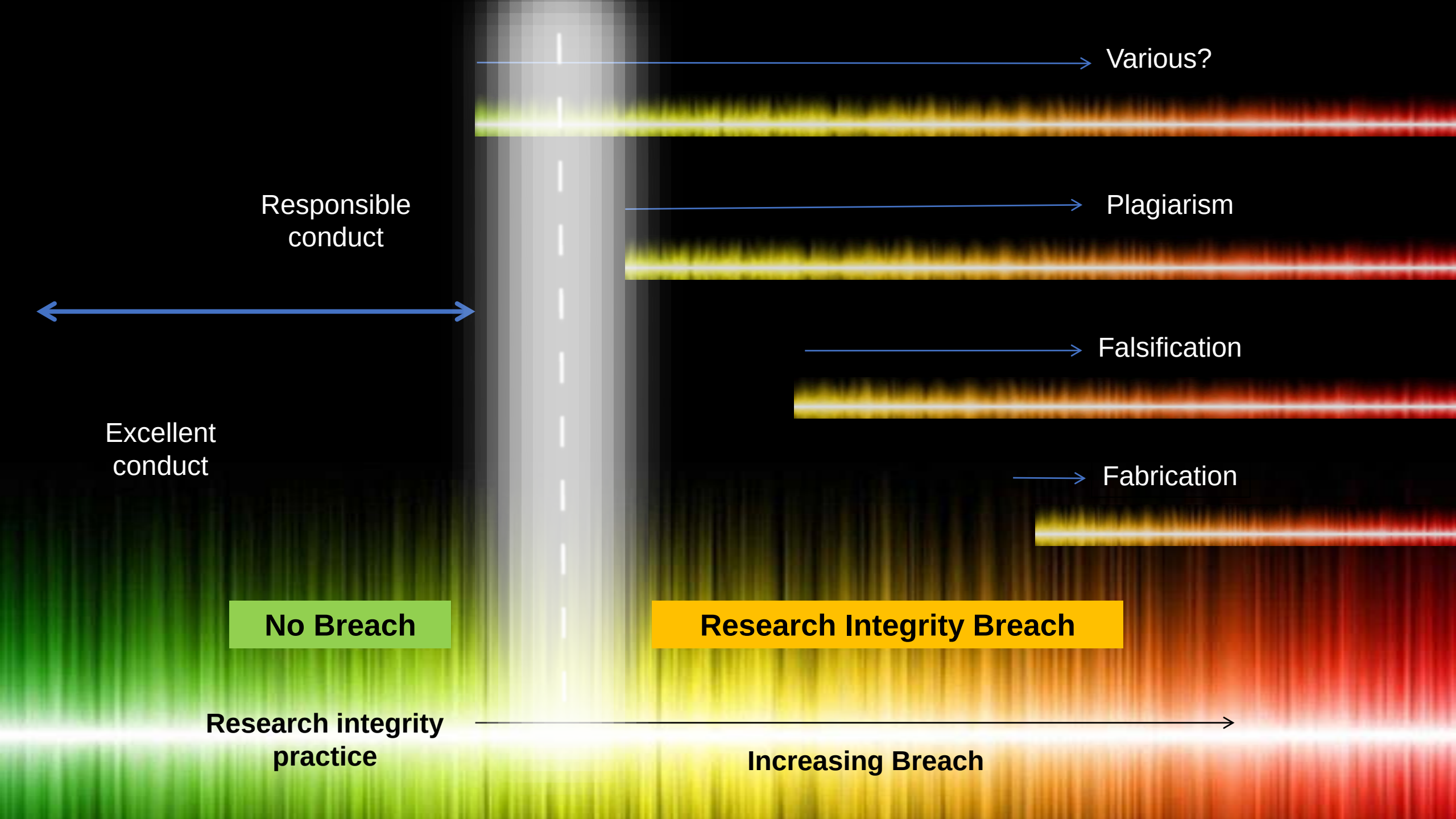
Dual use of research

Raising concerns about the integrity of research

Excellent Conduct ***Responsible Conduct***

Research integrity practice


Various?
Responsible conduct
Plagiarism
Falsification
Excellent conduct
Fabrication
Not Research Misconduct
Research Misconduct
Research integrity practice
Increasing Breach


Various?
Responsible conduct
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Fabrication
No Breach
Research Integrity Breach
Research integrity practice
Increasing Breach

- The national guideline for research integrity, the "*Australian Code for the Responsible Conduct of Research (2007)"* is currently under review
- The latest consultation draft is significantly different as compared to the current *Code*
  - *Concise*
  - *Principles-based and positive*
  - *Clarifies responsibilities for researchers and institutions*
  - *Does not use the term 'research misconduct' and instead expands the concept of 'breach'. It has become similar to the Canadian Tri-Agencies RCR Framework.*
  - *Does not establish a central government body for oversight*

- The national code is interpreted and implemented differently by institutions – perhaps this will be more coordinated in the future?

- Australian cultural considerations appear to be affecting the way researchers, institutions and government regulators are responding to research integrity – this is not well understood

Australian Government

AUSTRALIA IN THE ASIAN CENTURY

https://commons.m.wikimedia.org/wiki/User:Koyos

- Asia – Largest and most populous continent
- Diverse and dynamic research cultures
- Increasing research activity, investment and output
- Increasing focus on quality and excellence in research

- Asia-Pacific research cultures add to this diversity

More around the corner

Please consider the following
"harmonised"
research from Asia
and Asia-Pacific

Which of the following published X-ray crystallography data are reported by researchers based in Asia and Asia-Pacific?

a)

Table 1. Crystallographic data collection and refinement statistics

	HLA-DP5•Cry j 1(9-mer)
Data collection	
Space group	*P*1
Cell dimensions	
a, *b*, *c* (Å)	61.2, 64.4, 130.4
α, β, γ (°)	93.0, 97.5, 109.4
Resolution (Å)	64–2.4 (2.49–2.40)[a,b]
R_{sym}	0.116 (0.563)
$I/\sigma I$	12.3 (3.05)
Completeness (%)	97.4 (95.6)
Redundancy	3.5 (3.4)
Refinement	
Resolution (Å)	64.0–2.4
No. of reflections	70,445
R_{work}/R_{free}	0.201/0.237
No. of atoms	
Protein	12,380
Ligand	56
Water	267
B-factors	
Protein	29.1
Ligand	27.6
Water	29.8
rmsd	
Bond lengths (Å)	0.005
Bond angles (°)	1.07

[a] One crystal was used for data collection and refinement.
[b] Values in parentheses are for the highest-resolution shell.

b)

Table 1. Data collection and refinement statistics

	Data set 1	Data set 2	Merged
Data collection			
Space group	$P3_121$	$P3_121$	$P3_121$
Cell dimensions			
a, *b*, *c* (Å)	157.5, 157.5, 61.8	157.2, 157.2, 61.8	157.3, 157.3, 61.8
α, β, γ (°)	90, 90, 120	90, 90, 120	90, 90, 120
Resolution (Å)	50–3.5 (3.69–3.5)	50–3.25 (3.43–3.25)	50–3.25 (3.43–3.25)
R_{pim} (%)	13.5 (51.3)	6.9 (33.5)	11.2 (33.5)
Rmerge (%)	18.5 (99.3)	13.9 (98.8)	
$I/\sigma I$	8.3 (1.9)	11.2 (2.3)	12.3 (2.3)
Completeness (%)	100 (100)	87.1 (89.1)	100 (89.1)
Redundancy	7.1 (7.3)	6.0 (6.0)	12.3 (6.0)
Refinement			
Resolution (Å)			50–3.25 (3.33–3.25)
No. reflections			12,130 (1,940)
R_{work}/R_{free}*			22.6/25.1 (33.1/35.2)
No. molecules in ASU			1
No. atoms			
Protein			3,115
Carbohydrate			42
Water			0
B factors			
Overall			102.8
Peptide			101.1
Carbohydrates			116.3
Rmsd			
Bond lengths (Å)			0.007
Bond angles (°)			1.15

R_{pim}, redundancy-independent merging R factor; ASU, asymmetric units. Data for outer shell shown in parentheses.
*R_{free} test set size 5%, 704.

c)

Table 1. Data collection and refinement statistics

	DQ2.5–CLIP 1	DQ2.5–CLIP 2
Data collection		
Space group	C121	I23
Cell dimension		
a, b, c (Å)	128.86, 69.21, 146.69	137.01, 137.01, 137.01
α, β, γ (°)	90, 110.3, 90	90, 90, 90
Resolution (Å)	2.73	2.20
R_{merge}	10.0	12.9
I/σI	11.7	12.7
Completeness %	93.7	99.65
Redundancy	3.5	6.5
Refinement		
Resolution (Å)	39.26 to 2.73 (2.80-2.73)	36.62-2.20 (2.30-2.20)
Number of reflections	29676	21938
R_{work} / R_{free}	0.187/0.247 (0.29-0.37)	0.171/0.208 (0.231-0.296)
Number of atoms	6144	3176
Protein	6027	3003
Water	117	173
B-factors	45.0	28.1
Protein	36.6	28.1
Water	28.1	29.3
r.m.s deviations		
Bond length (Å)	0.01	0.01
Bond angle (°)	1.24	1.12
Ramachandran	96.3	98.1

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Japan

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USA

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Singapore

Which of the following authorship contribution statements for articles recently published in the open access journal *PLoS ONE* are reported by researchers based in Asia and Asia-Pacific?

a)

Conceptualization: HJK MYK YSS JHK.

Data curation: HJK YSS JHK.

Formal analysis: C-MC HJK.

Funding acquisition: MYK.

Investigation: HJK MYK YSS JHK.

Methodology: JJ HJK.

Project administration: MYK.

Resources: JJ S-HK C-MC.

Software: YSS JHK HJK.

Supervision: MYK.

Validation: JJ S-HK.

Visualization: HJK.

Writing – original draft: HJK MYK C-MC.

Writing – review & editing: HJK MYK YSS S-HK C-MC.

b)

Conceptualization: A LCK EK LSM EH MN SS YT.

Data curation: LCK LSM EH PW.

Formal analysis: LCK PW YT.

Funding acquisition: SS YT.

Investigation: A LCK EK LSM EH.

Methodology: A LCK EK PW YT MN.

Project administration: A LCK LSM EH.

Resources: A LCK EK.

Software: PW YT.

Supervision: A MN SS YT.

Validation: A EK MN SS YT.

Visualization: A LCK EK LSM EH PW YT.

Writing – original draft: LCK.

Writing – review & editing: A LCK EK PW YT SS.

c)

Conceptualization: TB HJ RJ BV.

Data curation: TB RK.

Formal analysis: TB.

Funding acquisition: HJ UB.

Investigation: TB KS AN TD YT TT RK.

Methodology: TB GT BV.

Project administration: HJ.

Resources: HJ YT TT UB TD BN.

Supervision: HJ PS UB GV.

Validation: TB AN YT.

Visualization: TB.

Writing – original draft: TB GT.

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Methodology: JJ HJK.

Project administration: MYK.

Resources: JJ S-HK C-MC.

Software: YSS JHK HJK.

Supervision: MYK.

Validation: JJ S-HK.

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Writing – review & editing: HJK MYK YSS S-HK C-MC.

Korea

b)

Conceptualization: A LCK EK LSM EH MN SS YT.

Data curation: LCK LSM EH PW.

Formal analysis: LCK PW YT.

Funding acquisition: SS YT.

Investigation: A LCK EK LSM EH.

Methodology: A LCK EK PW YT MN.

Project administration: A LCK LSM EH.

Resources: A LCK EK.

Software: PW YT.

Supervision: A MN SS YT.

Validation: A EK MN SS YT.

Visualization: A LCK EK LSM EH PW YT.

Writing – original draft: LCK.

Writing – review & editing: A LCK EK PW YT SS.

Thailand

c)

Conceptualization: TB HJ RJ BV.

Data curation: TB RK.

Formal analysis: TB.

Funding acquisition: HJ UB.

Investigation: TB KS AN TD YT TT RK.

Methodology: TB GT BV.

Project administration: HJ.

Resources: HJ YT TT UB TD BN.

Supervision: HJ PS UB GV.

Validation: TB AN YT.

Visualization: TB.

Writing – original draft: TB GT.

Writing – review & editing: TB GT AN.

The Netherlands

Which of the following examples of scholarly writing are by researchers based in Asia and Asia-Pacific?

a)

Abstract. The Cold War in the Third World was certainly much more dynamic than a mere clash of power and ideology between the belligerent big powers. In newly emerging areas like Southeast Asia for instance, many of the newly independent states have made clear from the outset that they do not wish to take sides in the Cold War, wanting to be non-aligned. For the United States, however, the Cold War was an uncompromisable situation and held that non-alignment was self-deception, naïve and even dangerous. This essay examines the interplay between the American policy of containment and the Indonesian policy of non-alignment with particular reference to the United States' reactions to Indonesia's relations with the People's Republic of China (PRC). The discussion covers the period from 1950 through to the Bandung Conference in 1955. An examination of the conflict between the American policy of "containment" and Indonesia's policy of "non-alignment" during the 1950s would serve to illustrate that the Cold War in Asia was much more dynamic that just clashes between the belligerent big powers.

b)

Abstract

Chinese feminist cinema in the postsocialist era is shaped by the grand narrative of nation building that glamorizes urban professional career women and their contributions to economic marketization and globalization. Such cinematic overemphasis on urban women proves inadequate as it creates a disturbing silence about the diasporic existence of non-urban women. This uneven condition demands the creation of an alternative cinematic feminism that visualizes the diversity of Chinese women and represents the heterogeneity of feminist cinematic expressions and female experiences. Using Li Yu's *Lost in Beijing* (2007, *Pingguo* 苹果) and Li Yang's *Blind Mountain* (2007, *Mang shan* 盲山) as case studies, this essay investigates how Chinese independent films re-negotiate female gender identity and crisis through commercialized visual realism and social intervention while in reality the postsocialist grand narrative of nation building redefines the living conditions of female migrant workers and women of limited resources.

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Malaysia

b)

Abstract

Chinese feminist cinema in the postsocialist era is shaped by the grand narrative of nation building that glamorizes urban professional career women and their contributions to economic marketization and globalization. Such cinematic overemphasis on urban women proves inadequate as it creates a disturbing silence about the diasporic existence of non-urban women. This uneven condition demands the creation of an alternative cinematic feminism that visualizes the diversity of Chinese women and represents the heterogeneity of feminist cinematic expressions and female experiences. Using Li Yu's *Lost in Beijing* (2007, *Pingguo* 苹果) and Li Yang's *Blind Mountain* (2007, *Mang shan* 盲山) as case studies, this essay investigates how Chinese independent films re-negotiate female gender identity and crisis through commercialized visual realism and social intervention while in reality the postsocialist grand narrative of nation building redefines the living conditions of female migrant workers and women of limited resources.

USA

Which of the following journals based in Asia and Asia-Pacific support the ARRIVE guidelines?

A. Turkish Journal of Surgery
B. Immunology and Cell Biology
C. Journal of the Anatomical Society of India
D. Hong Kong Journal of Occupational Therapy
E. Chinese Journal of Evidence Based Pediatrics
F. All of the above

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D. Hong Kong Journal of Occupational Therapy
E. Chinese Journal of Evidence Based Pediatrics
F. All of the above

In response to reasonable expectations of the research community, there is already a level of “harmonisation” to research from Asia and Asia-Pacific so that it fulfils the principles of research integrity such as transparency and accountability.

Other components of conducting and reporting research are not “harmonised”.

What other research things should we “harmonise”, and if we do, what do we expect it to deliver?

For research integrity initiatives, what do we mean by "harmonisation"?

Harmonisation

- Unity
- Togetherness
- Robustness
- Standardisation
- Efficiency

- An increase in the capacity or fitness of research to fulfil the principles of research integrity

Harmonisation

- Unity
- Togetherness
- Robustness
- Standardisation
- Efficiency

- Sameness
- Stasis
- Constraint
- Loss or reduction of diversity
- Incompatibility

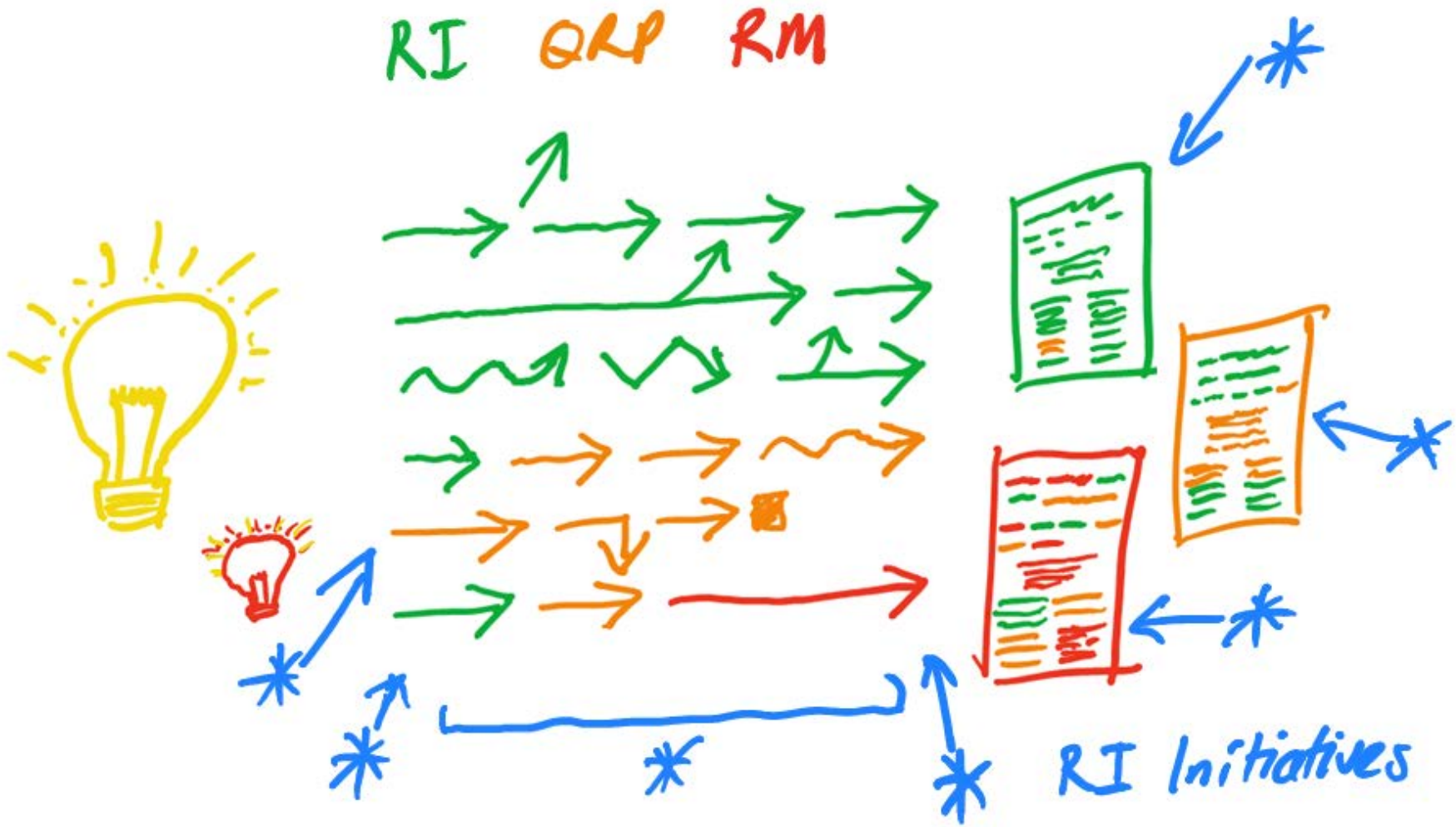
- An increase in the capacity or fitness of research to fulfil the principles of research integrity

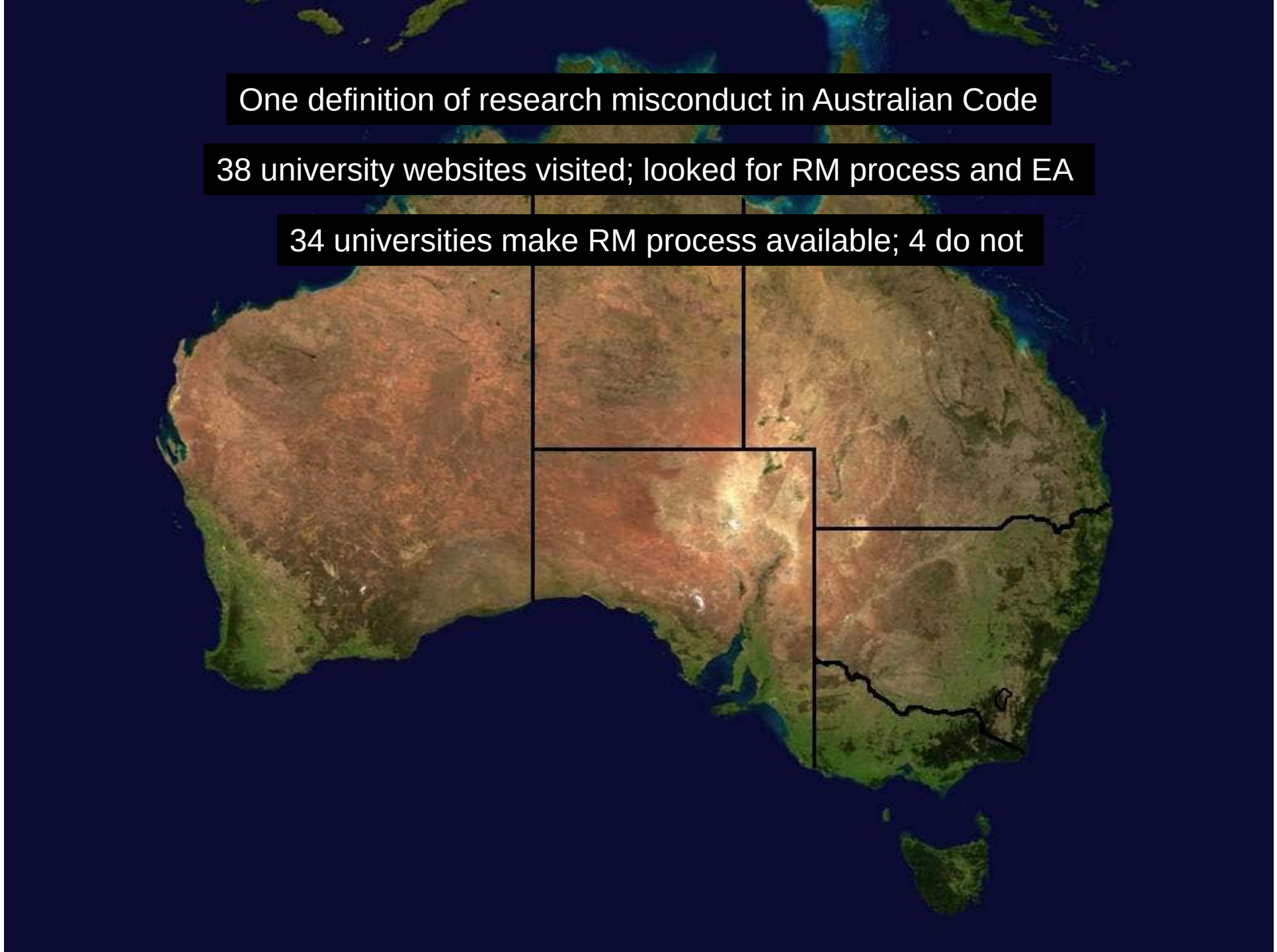
We should consider what might be lost or impacted by harmonisation

Stockr / Fotolia.com
https://www.iamo.de/en/research/projects/details/lascala/

Harmonisation of research integrity at institutions across Asia and Asia-Pacific

Harmonisation of research integrity at institutions across Asia and Asia-Pacific




One definition of research misconduct in Australian Code
38 university websites visited; looked for RM process and EA
34 universities make RM process available; 4 do not

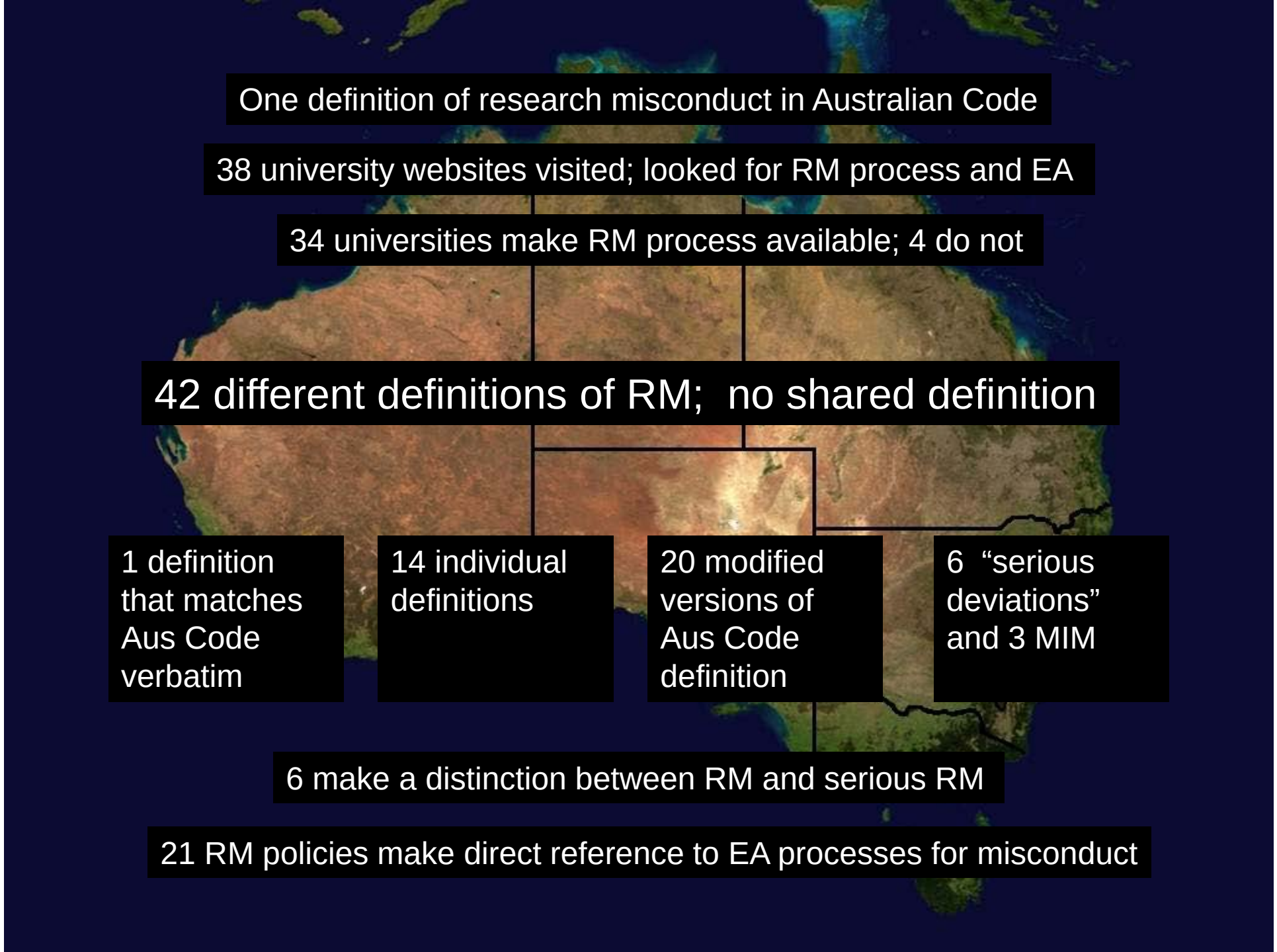

One definition of research misconduct in Australian Code
38 university websites visited; looked for RM process and EA
34 universities make RM process available; 4 do not
42 different definitions of RM; no shared definition
1 definition that matches Aus Code verbatim
14 individual definitions
20 modified versions of Aus Code definition
6 “serious deviations” and 3 MIM
6 make a distinction between RM and serious RM
21 RM policies make direct reference to EA processes for misconduct

Table 2: Types of behavior included in research misconduct definitions

Fabrication	183/183 (100.0%)
Falsification	183/183 (100.0%)
Plagiarism	183/183 (100.0%)
Other serious deviations	83/183 (45.4%)
Significant or material violations of regulations	42/183 (23.0%)
Misuse of confidential information	29/183 (15.8%)
Misconduct related to misconduct	27/183 (14.8%)
Unethical authorship other than plagiarism	26/183 (14.2%)
Other deception involving data manipulation	24/183 (13.1%)
Misappropriation of property/theft	19/183 (10.4%)
Misappropriation of funds	12/183 (6.6%)
Misrepresentation of one's credentials	9/183 (4.9%)
Failure to disclose significant financial interests	3/183 (1.6%)
Other	11/183 (6.0%)

David B. Resnik J.D., Ph.D., Talicia Neal M.A., Austin Raymond B.A. & Grace E. Kissling Ph.D. (2015)
Research Misconduct Definitions Adopted by U.S. Research Institutions,
Accountability in Research, 22:1, 14-21, DOI: 10.1080/08989621.2014.891943

- There isn’t an agreed definition of research misconduct in Australia, and sometimes even within an institution

- Despite an established legal framework for research integrity, policies for research misconduct at US also appears diverse

- *Institutional approaches that aim to increase the fitness of research integrity across Asia and Asia-Pacific appears highly diverse*

More around the corner

https://commons.m.wikimedia.org/wiki/User:Koyos

Small research integrity networks

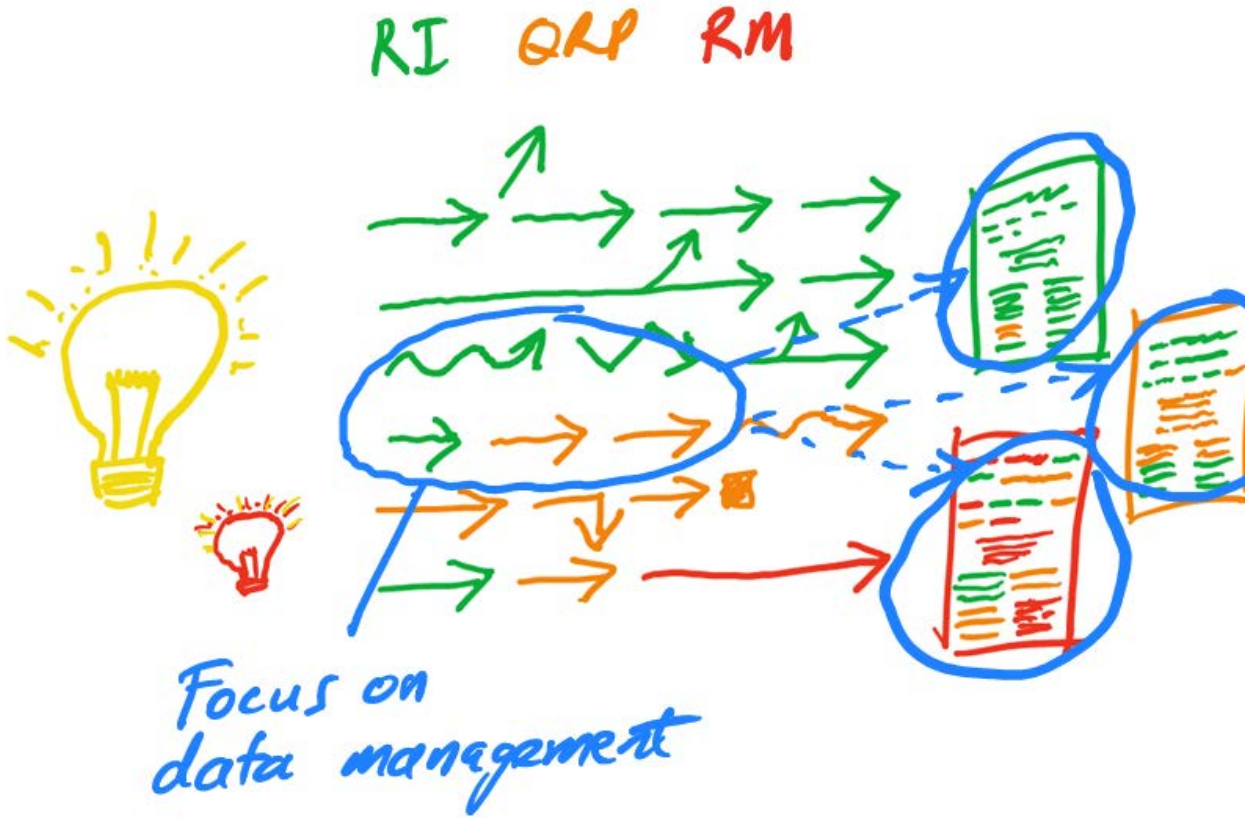
- Enable sharing of ideas and approaches; foster collaboration.
- A mechanism by which new selective pressures can be introduced at institutions to increase the fitness of research to better fulfil the principles of research integrity.
- The new selective pressures may be initiatives that result in harmonisation of research and the management of research at institutions.
- However, this might not be appropriate or even possible given the local ecology present at institutions.
- Local ecosystem and focus of a network are important

Association of Research Integrity Officers (USA)

- A long recent history of addressing research misconduct
- Increasing interaction with government regulators
- Focus on research misconduct and application of legal framework
- Positive impacts with high precision for improving accountability in research integrity
- Potentially less impactful for addressing other aspects of research integrity

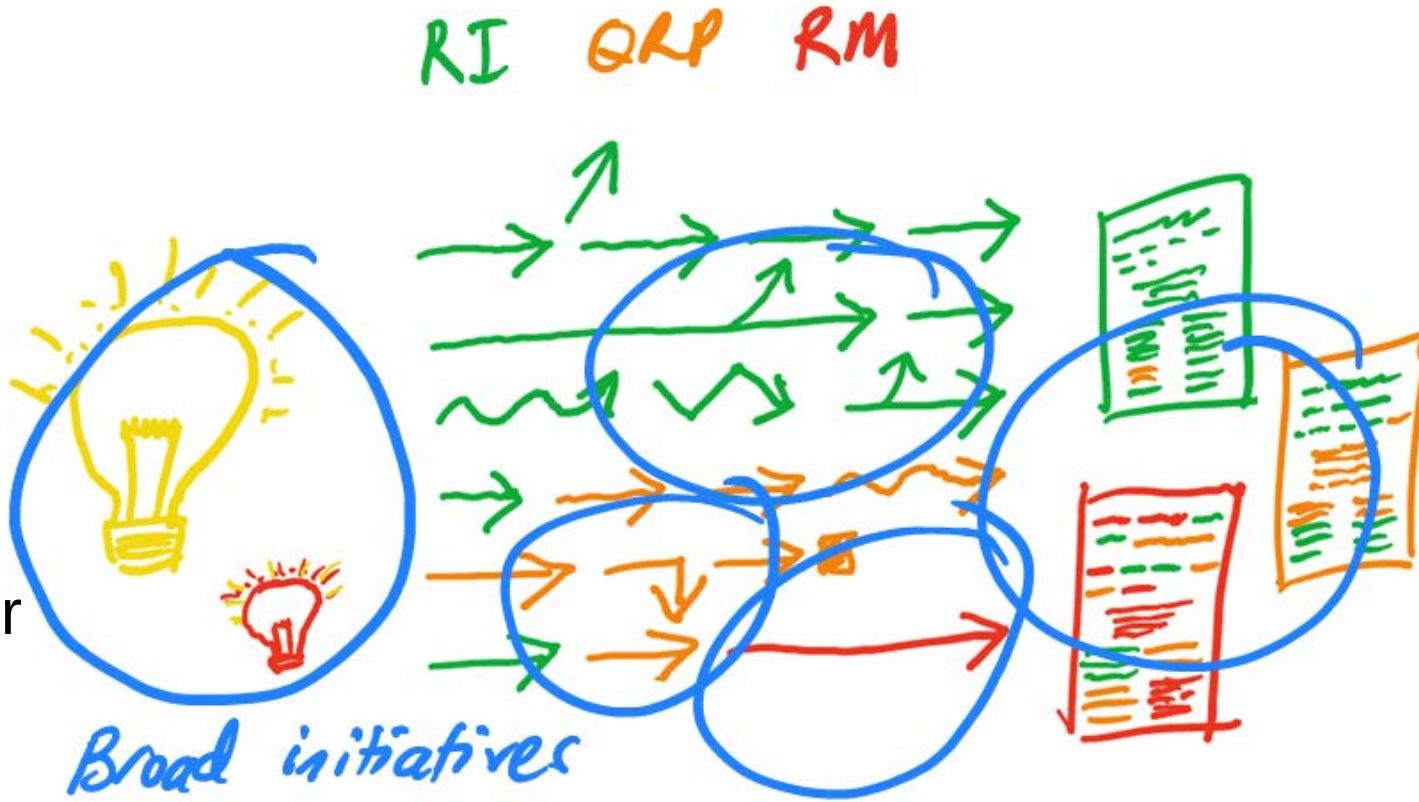
Research Integrity Advisor Data Management Group (Australia)

- Australian National Data Service, Deakin and RMIT, government-based funding agencies, ARMS
- Aims to build national capacity to address research integrity issues in the responsible management of research data via education and training
- Audience = Research Integrity Advisors at institutions
- Potential broad positive impacts for data management and advice



Center for Research Ethics Information (Korea)

- Institutions and government
- Provides information, policies, guidelines, education and training
- Broad discussion
- Online advice and counselling centre for researchers with concerns
- Potential broad positive impacts for all researchers



Asia and Pacific Rim Research Integrity Network (Asia and Asia-Pacific)

- Initiated by the US Office of Research Integrity
- By intelligent design, APRI has rapidly evolved from being a mechanism to build capacity in the investigation of research misconduct to be a forum for institutions to:

o *share and collaborate;*

o *to build understanding of differences;*

o *to bring lots of different voices together to create new research integrity*

- *APRI Network Meeting 2018 in Taiwan - UST*

Research integrity targets for exchange

1. Development of guiding principles for research integrity
   - *A shared language, increased harmony and acceptance of diversity*
   - *The Singapore Statement on Research Integrity is a good start*

2. Improving the management of research data by researchers
   - *Basic principles and responsibilities are the same across all research*
   - *Implementation of practices are highly discipline-specific*
   - *Aim is to increase the researcher's voice in data management*
   - *Can we incentivise this activity?*

3. Improving the management of research integrity (misconduct) investigations by institutions
   - *Basic principles and responsibilities are the same internationally*
   - *Simple questions - "Can we trust the research and the research process?" "Would we be happy for the research to have impact?"*
   - *Can we simplify this activity for institutions?*

The principles of research integrity are

- **Honesty** and **accountability** in all aspects of research.
- **Professional courtesy** and **fairness** in working with others.
- **Good stewardship** of research on behalf of others.

The Singapore Statement on Research Integrity

Summary

- Research integrity makes research trustworthy and excellent
- Research in Asia and Asia-Pacific displays both harmonisation and diversity in terms of research integrity
- The Australian response to research integrity is highly diverse

- Harmonisation aims to increase the fitness of research to fulfil the principles of research integrity. However, harmonisation may not always be suitable

- An exchange of diverse ideas, approaches and solutions across Asia and Asia-Pacific will improve the integrity of research
- Small research integrity networks are effective at this exchange

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