



SCIENCE IN AUSTRALIA GENDER EQUITY FORUM
GENDER EQUITY IN SCIENCE WORKSHOP -
November 2014

Summary of
workshop
findings



Australian Government

Chief Scientist



Australian Academy of Science

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SAGE Forum gender equity in science workshop, November 2014

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Foreword

Australian women make up 50.2% of the population and obtained more than 60% of the undergraduate degrees in 2013. However, women hold less than 30% of tenured jobs within academia. The disparity is even higher within the science community. While this proportion is a noticeable increase on just 10 years ago, evidence suggests that time alone will not be sufficient to fix the inequity. Women's careers within academia are advancing at a much slower rate than men's, and this rate has apparently stabilised at its current unequal level.

The factors that lead to the unequal outcomes for men and women in science are complex and varied, and consequently are not easy to change. Yet they are clearly leading to a tremendous loss of talent from academia given the undisputable tenet that scientific talent and aptitude are evenly distributed between the sexes. And while the causes of gender inequity in science disproportionately affect women, they almost certainly affect a proportion of men as well, and are therefore leading to poor outcomes for the sector as a whole. In fact, the determinants of gender inequity in science appears to be serious issues for more than one-third our workforce. Given the magnitude of the problem, it is imperative that science organisations and peak bodies systematically and strategically address the factors that lead to inequitable outcomes between men and women in science.

One of the drivers of change for the Australian Academy of Science was the fact that in 2013, not one woman was elected to the Academy Fellowship for the first time in years. This highlighted to the Academy that business as usual was no longer acceptable, and that it was time to take strategic steps to fix both how it elects Fellows to the Academy and, more importantly, how science disciplines treat women more generally.

Out of this conversation the Science in Australia Gender Equity (SAGE) Forum was born. This initiative aims to bring the entire scientific research community together to monitor and improve gender equity within Australian scientific and research organisations. It looks to the creation and active curation of a code of best practice for Australian science organisations to better address gender equity issues, and to create a means by which best practice is adopted, assessed and reviewed by our nation's scientific and research institutions.

Gender inequity is a major issue for science and research organisations throughout the world. In the United Kingdom, the Equality Challenge Unit has developed the Athena SWAN Charter—an initiative of particular relevance to Australia given the similarities between Australian and UK scientific and research institutions, its demonstrated success in the UK, and its adaptability to other nations (see section 3). Athena SWAN encourages science departments and institutions to establish an evidence base for internal issues causing gender inequity, and then to create and execute an action plan to address these issues. These actions are then assessed and revised in a virtuous cycle; with the evidence and action plans of each participating organisation available for the entire community to learn from.

In November 2014, representatives from across the spectrum of Australian scientific and research institutions met for a SAGE Forum workshop in Canberra to discuss gender equity and the potential of adapting Athena SWAN to Australia. They were joined by the UK's Equality Challenge Unit's Chief Executive, David Ruebain, and the Head of the Equality Charters, Sarah Dickinson.

This report provides a snapshot of the discussions that took place, and demonstrates the broad consensus that the Athena SWAN Charter provides an excellent vehicle by which Australia could quickly make major strides to address gender equity issues within the science sector. The initiative will

need to be adapted to the Australian landscape, and will need to be overseen by an Australian organisation. Given what's at stake, and the potential for major gains in what has been called a 'wicked' problem, we have every reason to proceed without delay to its implementation here in Australia. We are extremely excited by the prospects of an Athena SWAN-type initiative making major changes for the betterment of all Australians working in science and research, and will be wholeheartedly pushing for its broad-scale adoption over the coming years.

SAGE Forum Steering Committee

- Professor Nalini Joshi (co-Chair) FAA FRSN FAustMS
University of Sydney
- Professor Brian Schmidt (co-Chair) AC FAA FRS Nobel Laureate
Australian National University
- Professor Sharon Bell
Charles Darwin University
- Dr Marguerite Evans-Galea
Co-founder Women in Science Australia, Murdoch Childrens Research Institute & The University of Melbourne
- Professor Jennifer L Martin
NHMRC Women in Health Sciences Committee & University of Queensland
- Professor Caroline McMillen
Newcastle University
- Dr Roslyn Prinsley
National Adviser, Science and Mathematics Education and Industry, Office of the Chief Scientist

Executive summary

- The Science in Australia Gender Equity (SAGE) Forum was hosted by the Australian Academy of Science with support from the Office of the Chief Scientist, to address the issue of gender imbalance in science. A two day workshop was held on 25–26 November 2014 to consider gender equity issues and identify appropriate solutions for Australia.
- There is widespread agreement in the Australian scientific and technological communities that cultural change is needed to better enable scientists, regardless of their gender, to thrive in our research community, and in that way, to help maintain the talent and highest standards for science in Australia.
- While the gender balance at the PhD and post-doctoral stages of science careers is now even across most scientific disciplines, the proportion of woman in scientific careers is still declining with level of appointment. Less than one in five professorial positions in science are occupied by women.
- The workshop brought together senior representatives of universities, medical research institutes, science funding agencies, government research organisations, other stakeholders and the Equality Challenge Unit which runs the Athena SWAN Charter in the UK (see section 3).
- There was widespread support for the Academy to establish a forum called “Science in Australia Gender Equity (SAGE)” to create a catalyst for change across the sector.
- This report summarises the key issues raised by participants at the SAGE Forum workshop, and includes the recommendations made by the workshop to adopt an approach similar to the Athena SWAN Charter in Australia. The Athena SWAN Charter was established in 2005 in the UK in response to chronic under-representation of women in science, technology, engineering, maths and medicine (STEMM). It is a process where research organisations collect comprehensive data on women’s progression, critically analyse it, and implement an action plan to address the reasons behind the under-representation of women at senior levels.
- The workshop agreed that the potentially significant impact arising from the implementation of the Athena SWAN approach may need adaptation to the Australian context.

Key findings of the workshop

- 1) Two specific issues have a critical impact on gender equity in science: transitioning out of post-doctoral and early career researcher positions; and recruitment processes.
- 2) Confronted with a workplace environment where relatively few women are succeeding, it is difficult for female early career researchers to see ways in which they can advance their own careers.
- 3) The narrow range of metrics which the sector uses to define what we see as 'the ideal scientific researcher' too often focuses on quantity rather than quality of activities. This focus has a disproportionately negative impact on female scientists' career progression and career opportunity
- 4) Even a short career interruption can significantly impact recent track record and end or seriously delay promising careers in science. On trying to return to the workforce, many female scientists feel that gaps on their CV have made them uncompetitive when compared to male scientists.
- 5) The lack of mobility between sectors disproportionately affects women.
- 6) Differences in gender equity occur across different science, technology, engineering and mathematics (STEM) disciplines, between different departments within the same discipline, and between different types of research organisations. It is essential to identify causes of and develop responses to gender inequity at the local level.
- 7) It will take many years, if not decades, to achieve gender equity at senior levels in the sciences in Australia. We will need to look at impact and measure success over a range of time scales.
- 8) The sector is keen to trial Athena SWAN as soon as possible. A pilot should include large research-intensive universities, smaller regional universities, medical research institutes and government research organisations. As the pilot progresses it should expand to include more institutions.
- 9) National minimum gender equity targets for science organisations should be developed. These targets could form the basis of a gender equity framework that could be implemented by organisations and incorporated in national funding guidelines.
- 10) Undertaking an Athena SWAN approach would support organisations to identify what they can do to improve gender equity. Putting these actions into place will be a more difficult task, and will require the whole organisation to commit to making a difference. It is likely to require significant cultural change.
- 11) The advantages of the Athena SWAN approach are considerable. A national scheme would provide a consistent, efficient and effective approach to improving gender equity at senior levels in science.
- 12) Undertaking a pilot with a small number of institutions will identify where the Athena SWAN approach might need to be adjusted to the Australian context.
- 13) Linking research funding to participation in Athena SWAN (as is the case in the UK) is one way of ensuring organisations participate. However, at this early stage such an approach would risk undermining the good will that is needed to establish Athena SWAN.

Structure of this report

This report provides a summary of the presentations and discussions at a two day workshop on gender equity in science held on 25–26 November 2014 in Canberra¹. This report offers:

- a snapshot of the current gender equity landscape in science
- an overview of the Athena SWAN Charter—an initiative making a substantive difference to gender equity in science in the UK
- the key issues raised by discussion groups looking at some of the causes of gender inequity, along with possible solutions
- recommendations on how Athena SWAN might be introduced in Australia.

The report was never intended as a comprehensive overview of the issues facing women in science. For such an overview see the reports by the Federation of Australian Scientific and Technological Societies (FASTS)², the Australian Council of Deans of Science³, the US National Academies⁴ and a paper by Moss-Racusin and colleagues⁵.

¹ The program for the event can be found in Appendix A

² Bell, S., O'Halloran, K., Saw, J. & Zhao, Y. (2009). Women in Science in Australia: Maximising productivity, diversity and innovation, Canberra: Federation of Australian Scientific and Technological Societies (FASTS), http://scienceandtechnologyaustralia.org.au/wp-content/uploads/2011/06/2009report_wise.pdf

³ Dobson, I. R. (2014) Staffing University Science in the Twenty-first Century, Australian Council of Deans of Science. <http://www.acds.edu.au/tlcentre/wp-content/uploads/2014/06/ACDS-Science-Staffing-2014-Proof10a.pdf>

⁴ National Academies: Committee on Science, Engineering, and Public Policy. (2007) Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering, Washington D.C.: The National Academies Press. <http://www.nap.edu/catalog/11741/beyond-bias-and-barriers-fulfilling-the-potential-of-women-in>

⁵ Moss-Racusin, C. A., Dovidio, J. F., Brescoll, V. L., Graham, M., & Handelsman, J. (2012). Science faculty's subtle gender biases favour male students. Proceedings of the National Academy of Sciences. <http://www.pnas.org/cgi/doi/10.1073/pnas.1211286109>

About the Athena SWAN Charter

The Athena SWAN Charter evolved in the UK from work between the Athena Project and the Scientific Women's Academic Network (SWAN), to advance the representation of women in science, technology, engineering, medicine and mathematics (STEMM). The Charter was launched in 2005, with the first awards conferred in 2006. The Charter has grown consistently from its inception.

The Equality Challenge Unit is a charity, funded through the UK higher education funding bodies and representative organisations.

Unlike other gender equity initiatives, Athena SWAN does not just determine the existence of appropriate policies such as family friendly support packages or support for women returning from extended leave. Instead it is a process where organisations collect comprehensive data on women's progression, critically analyse it, and implement an action plan to address the reasons behind the under-representation of women at senior levels in their organisation.

[More about the effectiveness and impact of Athena SWAN in the UK](#)

See section 6 for more information about Athena SWAN.

Overview of the current gender equity landscape in Australia

Professor Sharon Bell, Deputy-Vice Chancellor at Charles Darwin University and a leading expert on the role of women in Australian science.

Since the 1950s, progress has been made to address gender imbalances at the bachelor and postgraduate level. In the 1950s female higher education enrolments accounted for just 20% of total enrolments, whereas by 2013, this had shifted to approximately 58%. However the progress made at this level has not been matched with progress in terms of career progression within science.

The chart below shows that there is a leaky progression pipeline for female scientists within universities, with gender imbalance becoming more acute at each stage of seniority. At the most senior levels, this disparity is influenced in part by cohort effects (i.e. gender disparity at Level E reflecting gender disparity at postgraduate level in previous decades). However, there are clearly also immediate factors at play, and targeted and sustained action is needed to identify the reasons and address the problem. Identifying these factors and making suggestions on potential actions that could be taken was explored during the rest of the workshop.

A more comprehensive overview of the gender equity landscape outlined by Professor Sharon Bell at the workshop is provided in Appendix B.

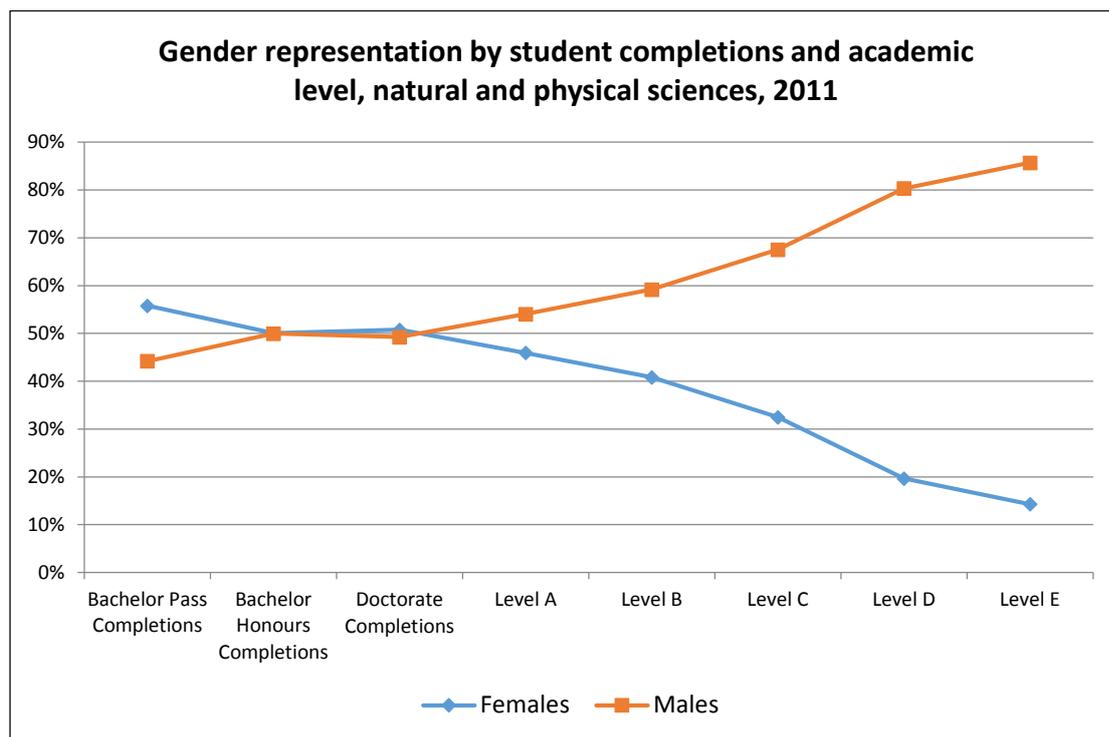


Figure 1 Gender representation by student completions and academic level at Australian universities, natural and physical sciences, 2011

Source: Bell, S. and Yates, L. *Women in the Science Research Workforce: Identifying and Sustaining the Diversity Advantage*, Unpublished Project Report, December 2015, p 12 [DIISRTE Higher Education Statistics Collection, customised data, 2011]

Tackling gender equity from within the sector—the Athena SWAN Charter

David Ruebain, Chief Executive, and Sarah Dickinson, Head of Equality Charters, from the UK Equality Challenge Unit, provided an overview the Athena SWAN Charter and its operation to workshop participant. Professor Tim Wess, now at Charles Sturt University, discussed his past experience of implementing the Charter within a science department at a UK university.

The Athena SWAN Charter

The Athena SWAN Charter was established in 2005 in response to chronic under-representation of women in science, technology, engineering, maths and medicine (STEMM) in the UK, and negligible change in women's progression in STEMM since the 1990s. Founder members established the Charter as they recognised the substantial waste of female talent and loss of investment in training female scientists only to lose them from the field. There were 10 foundation members of the Charter, including large research-intensive universities such as the University of Cambridge, the University of Oxford, University College London and Imperial College London. The Charter has now grown to 114 members and has achieved near sector-wide coverage.

The six Charter principles

Institutions wishing to become a member of the Athena SWAN Charter must pledge their support for the Charter's six principles:

1. To address gender inequalities requires commitment and action from everyone, at all levels of the organisation
2. To tackle the unequal representation of women in science requires changing cultures and attitudes across the organisation
3. The absence of diversity at management and policy-making levels has broad implications which the organisation will examine
4. The high loss rate of women in science is an urgent concern which the organisation will address
5. The system of short-term contracts has particularly negative consequences for the retention and progression of women in science, which the organisation recognises
6. There are both personal and structural obstacles to women making the transition from PhD into a sustainable academic career in science, which require the active consideration of the organisation

How does Athena SWAN work?

Unlike other gender equity initiatives, Athena SWAN is not a box-ticking exercise to determine the existence of appropriate policies such as family friendly support packages, or support for women returning from extended leave, although the Charter does recognise that these are important initiatives. Instead, Athena SWAN requires member organisations to:

1. collect data on women's progression within the organisation
2. critically analyse the data
3. identify reasons for exclusion and under-representation of women in their organisation
4. develop an action plan to address these (action plans will necessarily be individual to each department)
5. show progress over time

The assessment process

After engaging in the process of data collection and analysis, issue identification, planning and implementation as outlined in the previous section, institutions taking part in Athena SWAN apply to

the Equality Challenge Unit, a UK not-for-profit organisation, for an award that recognises the progress they have made. Awards are given at both the research organisation level (university or research institute), and at the departmental or school level. In November 2014 there were 154 submissions, and 113 awards were made, representing a success rate of 73%. Awards can be given at the bronze, silver or gold level depending on level of achievement. Awards are valid for three years at which point institutions must reapply for a new award.

The Equality Challenge Unit oversees and develops the Athena SWAN policies and processes, trains award assessment panellists (currently over 300 academics, HR directors and other experts), holds information workshops, runs evaluations, coordinates and moderates assessment panels, oversees appeals processes and develops strategy- and subject-specific approaches.

The benefits of Athena SWAN

Athena SWAN requires organisations to engage in thorough self-reflection of their workplace to highlight areas that contribute to making a positive change at the local level. It provides a focal point to embed the many existing informal good practices already underway, to think through what impact they are having, and to determine what further action is required.

Athena SWAN awards show potential applicants to positions within the participating organisation the extent to which the department or institution has a good workplace environment for women and takes issues of gender equity seriously. It is now common to see departments or institutions state their Athena SWAN award level within job advertisements.

The impact of Athena SWAN

Evaluations have found that Athena SWAN has had a positive impact on gender equity within participating institutions and departments. Those departments that have received awards have noted that Athena SWAN has improved their workplace environment. Increased career satisfaction and opportunities for development and promotion have been seen, as has improved fairness in workload distribution.

For organisations, Athena SWAN has become a means to formalise and bring together existing gender equity processes already underway within their institution. It has encouraged institutions to find the data they need to better understand the issues facing their staff, and to understand reasons at the local level as to why female scientists' careers are not progressing at the same rate as those male scientists. For many institutions the introduction of Athena SWAN has resulted in improved working practices to support career progression, and this is resulting in increased visibility of women in science, and an increased proportion of women in STEMM departments.

The good practices being implemented within institutions are benefiting both women and men and are contributing to an improved working environment and culture.

Recognition of Athena SWAN by research funders

Research funders in the UK have recognised Athena SWAN as being an effective way to encourage gender equity in science.

For example, medical schools applying for National Health Service (NHS) National Institute for Health Research (NIHR) Biomedical Research Centres and Units funding need to have achieved at least an Athena SWAN Silver award to be eligible.

All institutions in receipt of Research Council UK funding need to show how they are promoting equality and diversity, with Athena SWAN as the recommended way to do this.

The National Institute for Social Care and Health Research (NISCHR; the Welsh Government Division within the Department for Health and Social Services) expects all applicants applying for NISCHR Centres or Units funding to be in institutions working towards Athena SWAN Silver status.

Overseas interest in Athena SWAN

While Athena SWAN is a UK initiative, many of the issues at the heart of gender equity in science are common to other countries. As a result, there has been considerable international interest in Athena SWAN. A three-year pilot study of Athena SWAN recently commenced in the Republic of Ireland.

Workshop group discussions

Having heard from the Equality Challenge Unit about the establishment and successes of Athena SWAN, the workshop participants identified major issues contributing to gender inequity in Australian science. Ten discussion groups explored the causes of gender inequity, possible solutions, and how Athena SWAN might be introduced in Australia. There was energetic discussion in each group which increased the understanding of the complex issues facing women in science. The following represents a brief summary of the workshop discussions. It is by no means an exhaustive record of the discussions or of the issues at hand and is intended simply to highlight some of the possible causes of gender inequity in the sciences, and to suggest some solutions.

Employment practices

While employment practices can vary from institution to institution and across disciplines, two specific critical issues are impacting on gender equity: transitioning out of post-doctoral and early career researcher positions, and recruitment processes.

Transitioning out of post-doctoral and early career researcher positions

The transition from the post-doctoral and early career researcher positions was identified as a critical stage in a scientist's career, and one at which circumstances can force researchers to leave science and pursue other career opportunities. Employment practice issues that impact on researchers at this stage of their career include the use of short-term employment contracts, the exceptionally competitive nature of securing positions, and the reliance on more senior academics in securing research funding. While such employment practices affect most scientists, it was felt that the impact is disproportionately high for female scientists. The lack of sustainable career pathways results in many female scientists leaving science all together.

At this stage of their career, scientists are frequently obliged to take whatever opportunity presents itself and whatever location is available to stay in science. This can result in scientists needing to relocate from one side of the country to the other when one research contract expires, and many female scientists find that this is not a realistic proposition. This can be for a range of reasons, including family and caring responsibilities that disproportionately fall to women.

Affirmative action within recruitment processes

Gender imbalance at the time of recruitment of students and staff can result from unintentional bias at all stages of the recruitment process, from the advertising of positions, assessing résumés, and the techniques used at interview (including diversity within interviewing panels). While the effect of bias at each stage may be small, in combination it can have a huge effect on the success of women gaining positions and promotion.

In some cases affirmative action might be required to address gender imbalances. This action should take place at the very start of recruitment processes, such as in the identification and encouragement of suitable women scientists to apply for positions. Position descriptions and position criteria should be reviewed to ensure that implicit bias is not introduced into the process. In some cases aspirational targets might be required to help achieve a better gender balance within a department.

Gendered nature of leadership

The gender imbalance in science is most acute at the senior levels of science, and the lack of women in senior leadership positions has led to a number of significant and ongoing problems that are difficult to overcome. Confronted with a workplace environment where relatively few women are succeeding, it is difficult for early career researchers to see ways in which they can advance their own

careers. As time progresses and more female colleagues leave the science workforce, for some it is felt that it is only a matter of time before they are unable to sustain a career in science and will have to leave themselves. Having more women in senior leadership positions would help to inspire the next generation of female scientists.

The dominance of men in leadership positions can at times make it difficult for issues of gender equity to be raised at senior levels. While many male senior leaders in science recognise gender equity as an issue that needs serious attention, not having confronted the unique issues facing women scientists themselves, it can sometimes be difficult for them to identify the scale and urgency of the problem and the actions needed to overcome it.

The ideal scientific researcher

Excellence, and therefore career progression in science, is strongly influenced by a narrow set of metrics: publication outputs, citations and grant income. The CV of a researcher—in particular its length—is frequently taken as a proxy for quality, and the impact of this is disproportionately felt by women. This narrow range of metrics which the sector uses to define what we see as ‘the ideal scientific researcher’ has a negative impact on female scientists’ career progression and career opportunity, and can too often focus on quantity rather than quality of activities. Both the ARC and NHMRC have made great strides in this area and do have policies in place to overcome this issue. Such efforts need to be put in place within the workplace including within recruitment practices and promotion panels.

Accepting time out periods

Family caring responsibilities disproportionately fall on women, and can result in career interruptions. This is true across all sectors, but it was felt that this causes specific problems within science. Career development and job security for scientists is frequently tied to recent track record, particularly grant success and publication outputs. Even a short career interruption can significantly impact recent track record and in doing so, end or seriously delay promising careers in science. On trying to return to the workforce, many female scientists have felt that gaps on their CV have made them uncompetitive when compared to their male colleagues.

The impact of taking a career break can be severe for any scientist, particularly those at junior levels. After taking a career break it can be very difficult to return to a career and the occasions where a return is possible it can severely slow down career progress. For scientists working within the current competitive funding system, career breaks can make it exceptionally difficult to gain success in ARC and NHMRC grant rounds (despite advances within both of these agencies noted previously). Furthermore, once out of the science system—even temporarily—research momentum and knowledge of contemporary developments can quickly be lost, and scientists can find it difficult to participate in scholarly collaborations or take part in conferences where they might promote their work and, as such, this impacts on their publication and citation rates.

Suggested ways to overcome this issue include having in place fellowships aimed at kick-starting research careers after career breaks. While on a career break it would also be useful for institutions to offer ‘staying in touch’ days so that scientists can still feel part of the system, and keep abreast of the latest developments and collaboration opportunities for when they return.

Employers should also put in place policies that encourage such breaks to occur when needed, and support scientists to return to their position after a break without a negative impact on their long-term career prospects.

Mobility across sectors

To be internationally competitive, Australia needs to develop a strong innovation ecosystem and this will require researchers and scientific professionals with cross-sector expertise⁶. Yet the benefits of having researchers confident in navigating the different sectors and moving across disciplines and professions are currently under-valued. There are several barriers that inhibit mobility between research, higher education, industry and government, but how the 'ideal' scientific researcher within academia is evaluated is particularly problematic. There is little room for scientists to leave university research positions to pursue careers in industry, even temporarily, for fear of negatively impacting on their track records in research. On the other hand, it can sometimes be difficult for industry to see the relevance of the skills developed in traditional research careers. The result is a series of separate career pathways for scientists with not enough overlap.

This environment places significant pressure on women (and men) to develop the skills and track record valued only in one science career pathway, at the expense of developing broader transferable skills, particularly the skills needed within industry. Too frequently what we see as the ideal scientific researcher within one sector does not match up with another sector. A lengthy list of academic publications is not necessarily seen as desirable within some industry settings, and research commercialisation skills gained within industry are not as highly valued as the traditional publication and grant income metrics used to evaluate potential within academia. This is problematic for all scientists as it reduces career opportunities, and it is problematic for the science system because it can lead to reduced collaboration between sectors.

However, the impact of this lack of mobility between sectors is disproportionately experienced by woman. Given that woman are more likely to have career breaks and interruptions than men, the need to pursue new opportunities is more likely to fall to them. Greater mobility between different sectors would increase the opportunities available to continue a science career after a career interruption. Improving mobility between sectors not only offers a good opportunity to improve on gender equity in science, but will improve the science system as a whole and allow Australia to build on the relatively low levels of collaboration between universities, public sector research agencies and industry.

Developing intersecting career pathways is not a straightforward exercise and requires action in a number of areas, including by research funders, research organisations and researchers themselves. Research councils such as the ARC and NHMRC, should look to see how funding rules could be improved to give greater value to industry experience. There are opportunities to encourage greater industry collaboration and funding of university-based research by changing the funding incentives for universities so that industry funding is valued in a similar way to research council funding. These changes will encourage universities to shift the criteria for measuring success to include other attributes, such as industry experience, when making new appointments or considering promotion applications.

Differences across STEM disciplines

Differences in gender equity occur across STEM disciplines. For example physics, maths and engineering have historically had far fewer women (lower percentages) at the undergraduate level than the life sciences, though all show attrition of women through career progression. There are also differences between equivalent departments in different universities due to leadership differences.

⁶ See Bell, J, Frater, B, Butterfield, L, Cunningham, S, Dodgson, M, Fox, K, Spurling, T and Webster, E (2014) *The role of science, research and technology in lifting Australian productivity*. Report for the Australian Council of learned Academies, www.acola.org.au.

Other differences may occur between scientists employed at different types of research organisations, such as universities, medical research institutes, or government science agencies.

These differences suggest that different types of actions are needed in different settings, and that whilst sharing best practice at the high level is important, it is essential to develop local responses to gender equity issues.

What do we define as success in an Athena SWAN-type initiative

It will take many years, if not decades, to achieve gender equity in the sciences in Australia, and as such it is appropriate to look at impact and measure success over a range of time scales.

Long-term success will be the elimination of the current gender imbalance in science within Australia.

Achieving such a goal will take many years, if not decades, given the systemic nature of many of the contributing factors towards creating such gender imbalance, the lag time between actions now and future career pathways, and the fundamental gender imbalance in numbers across the board in some STEM disciplines such as engineering, physics and computer science. It will take many years before some of the actions needed to overcome such imbalance will have an impact.

As such, a wider range of success parameters need to be considered, including meeting short-, medium- and long-term goals.

Medium-term success will be reducing the gender gap by 20% in five years.

While this is an ambitious target, it is achievable if determined efforts are made across the sector. To assess whether this target has been met, a series of different measures will need to be developed. These measures will look at how improvements are made in different STEM disciplines and at different stages of career. The measures will look at both employment—such as reducing the gap in the ‘scissors graph’ (see section 5)—and research grant application and success rates. The top three success principles are retention of women in senior positions in science, changes in culture and attitudes across the organisation, and diversity in management and policy-making.

Three success indicators are:

1. A culture that attracts, retains and advances women in STEM leadership positions
2. Equivalency in funding success
3. Removal of barriers to the full and equal participation of women in the workforce.

In the short-term, achieving widespread sector support for taking real action to tackle gender inequity in the sciences will be the most important and realistic indicator of success.

Establishing widespread support entails research organisations making a real commitment to tackling the causes of gender inequity in the sciences. A goal of having a significant number of research organisations pledging to support principles like those of Athena SWAN is realistic within the next year, as is a proposed pilot by the SAGE Forum of an initiative like Athena SWAN in Australia. Establishing this as an ongoing initiative with comprehensive coverage will also be a worthwhile ambition in the short term.

Designing a pilot study

What type of organisation should manage a pilot?

There is enthusiasm within the sector to undertake a pilot of Athena SWAN within Australia as soon as possible. Establishing and funding a new organisation from scratch to undertake a pilot study of

Athena SWAN would inevitably delay the start of the process. An existing organisation such as the Australian Academy of Science might undertake the initial pilot as a special project, with the view of spinning out the project into a not-for-profit organisation that would then go on to grow and manage the process on ongoing basis.

What resources are required to undertake a three-year pilot?

Resources will be required for an organisation to host a three-year pilot program. If an existing organisation hosts the pilot, it might be possible to leverage their expertise, seek in-kind contributions, and achieve a timelier establishment of the initiative. The resources required by such an organisation will largely be human project management resources and training initiatives for pilot participants. It is desirable to have 1-2 people working full time to ensure the success of the pilot. The cost of providing these resources can be met through a combination of participant fees and sector sponsorship.

An agreement between the host organisation of the pilot and the Equality Challenge Unit in the UK (that runs Athena SWAN) will be needed so that the pilot can benefit from and adapt for the Australian context the expertise, processes and materials already developed for the UK science sector.

Participant organisations will need to contribute resources to implement Athena SWAN within their own organisation. These resources will be a combination of academic input and administrative support. Most universities in the UK have dedicated administrative human resources to manage their Athena SWAN participation and award applications.

Which science sector organisations should participate in the pilot?

It would be desirable for an initial pilot to include representatives from large research-intensive universities, smaller regional universities, medical research institutes and government research organisations.. As the pilot progresses it should be possible to expand to include other institutions.

Gender equity framework across different sectors

There is benefit in developing a set of national minimum gender equity targets that are expected of science organisations. These targets could form the basis of a gender equity framework that could be implemented at the local level, but also be used within national funding guidelines. These minimum standards will only be pursued and met if the right incentives are in place for organisations to take them seriously. One option is to mandate minimum standards of achievement against such targets for organisations to be eligible for the receipt of publicly-funded research, both from the research councils and also through other avenues such as block grants. Mandating a minimum level of achievements against such targets could be incorporated into funding rules, or university compacts.

If such a framework is developed then it will be important to set ambitious but realistic targets. Whilst such targets could include setting mandatory quotas to improve on the number of women in science, such a policy could prove problematic with both legal and ethical concerns potentially standing in the way. Alternatively setting minimum thresholds for organisations to meet in terms of the implementation of gender equity policies would be more straightforward and feasible in the short to medium term⁷.

⁷ Since the SAGE Forum Workshop the National Health and Medical Research Council have announced a new gender equity policy under which institutions will have until the end of 2015 to update their gender equity policies and submit them to NHMRC for consideration. For further details see: <https://www.nhmrc.gov.au/media/releases/2015/nhmrc-announces-new-gender-equity-policy>

Local versus global actions for change

Encouraging local reflection and action on issues that influence gender equity

Local reflection is essential to the Athena SWAN process. People at all levels need to think about how their actions might impact on gender equity within the workplace. This can include considering how the timing of a meeting can impact on the participation of those with childcare commitments, or how the wording of a job advert can inadvertently lead to gender bias in the recruitment process. It should not prove difficult to identify areas where action needs to be taken, but encouraging this local reflection and action to take place on a continuous basis is a more difficult task.

Encouraging organisation-wide actions to improve gender equity

Undertaking an Athena SWAN process will enable organisations to identify actions needed to improve gender equity. Putting these actions into place is a far more difficult task, and will require the whole organisation to be on board and committed to making a difference; to a large extent this will require significant cultural change. Organisations should be encouraged to identify male as well as female champions of gender equity initiatives so that the problem is seen as an issue that everybody needs to deal with.

How do we influence gender equity on the national scale?

Many of the contributing issues towards gender inequity in science are societal issues, and while we should strive to make progress within science, action also needs to be taken on the national scale to combat gender inequity right across society. Making meaningful progress will require action from outside of science too, but it is hoped that by taking the initiative and demonstrating that change is possible at the local level this will encourage action on different fronts, including at a national level.

The Athena SWAN approach: advantages and disadvantages

One of the challenges of introducing Athena SWAN in Australia would be an increase in the administrative and reporting burden on institutions. In most cases the data needed to participate already exists, and the hard work will come with identifying and implementing the practical actions that will make a difference to gender equity. Any new initiative which requires new work to be undertaken is likely to face resistance in some areas, so it is imperative that work is undertaken to sell the considerable benefits of the initiative and to highlight the intellectual and financial loss that occurs as women scientists leave the science workforce.

It is particularly important that Athena SWAN is not seen as an initiative which is just about women, or that should be led solely by women within a department. The workload for the initiative needs to be shared equally by male and female colleagues so that the administrative burden for the approach does not unfairly fall to the few women within a department.

The best way to overcome resistance will be to show that Athena SWAN works. This can be done by pointing to the success that the approach is having in the UK and by demonstrating that the process can work in Australia. This will require a slow and steady build up so that the approach can be trialled and subsequently adapted to the Australian context.

The advantages of the Athena SWAN approach are considerable. A national scheme will help to provide a consistent, efficient and effective approach to improving gender equity in science. Encouraging multiple institutions and organisations to work within the same broad framework will allow best practice and information on successful strategies to be shared.

While Athena SWAN is a UK initiative, the focus is to identify specific issues impacting gender equity at the local level and then put in place an action plan to address these issues. As such, it should not be difficult to adapt the approach for use in Australia.

Advantages	Disadvantages
<ul style="list-style-type: none"> • a proven system that works • not 'box-ticking', but practical measures • incentives for continued improvement • better working conditions for all • gives visibility to the issues • catalyst for cultural change at scale. 	<ul style="list-style-type: none"> • need 'real' drivers—or revert back to the old paradigms • reporting burden • resistance from senior leadership • factors beyond control of individual institutions • potential for 'gaming the system' • inconsistent data across institutions • poor quality control.

How to adapt an Athena SWAN-type initiative to the Australian context

Athena SWAN has enabled institutions in the UK to make real progress in terms of identifying and finding ways to overcome barriers to gender equity in the sciences. This report has already discussed the many benefits that might be gained from taking a similar approach in Australia. While there is a great degree of similarity between the UK and Australian science system, and the issues contributing towards gender inequity in the sciences, there are a range of issues and potential solutions that could be overlooked if an Athena SWAN approach was adopted without being adapted to the Australian context.

These differences include:

- operating within different legal frameworks
- the far greater geographical distances between science institutions and the impact of this on career development
- the possible mechanisms in which such an initiative could be funded
- availability of data to identify gender inequity and potential solutions
- social and cultural differences between the two different research systems.

Undertaking a pilot study with a small number of institutions was seen as a good way to identify areas where Athena SWAN might need to be adjusted to the Australian context.

How could the program be adjusted to fit within the Australian context?

Given that the cultural overlap between the UK and the Australian research system and the many researchers that have experience of both systems, there should be limited difficulties in implementing Athena SWAN in Australia. The focus on collecting data and identifying where problems lie at the local level, along with practical solutions, make the approach suitable to adaptation to the Australian context.

There are a number of specific issues that need consideration prior to establishing an Athena SWAN-type initiative in Australia. For example, it is impractical for this to be run out of the UK Equality Challenge Unit, so an appropriate host organisation for Athena SWAN in Australia needs to be identified or established. Importantly, it would not be appropriate for this body to be a government department or funding agency, although there are opportunities to encourage support and engagement from these organisations.

The Equality Challenge Unit is responsible for managing the Athena SWAN Charter and owns the intellectual property associated with it. Should Australian institutions decide to pursue a franchise

model or licence to use the charter then consideration needs to be given as to how Australia might act independently in the future.

Australia has a large number of independent research organisations, particularly medical research institutes. The administrative burden of implementing Athena SWAN within these organisations could be relatively higher than larger universities. Consideration will need to be given as to how to support these research organisations, and whether a consortium approach might be appropriate.

Should/could an Athena SWAN-type initiative be linked to funding in Australia?

In 2011 Dame Sally Davies, the Chief Scientific Adviser for the UK Department of Health, announced that the National Institute for Health Research would only expect to shortlist medical schools for biomedical research centre and unit funding if the school held at least an Athena SWAN Silver Award. This announcement had the effect of significantly boosting participation in Athena SWAN and raising the profile of the Charter. The link between funding and participation in the Charter was not made by the Equality Challenge Unit (responsible for managing the Charter), but rather a funding body. Research funders in Australia could at some point choose to implement a similar policy, and the NHMRC has already indicated that research organisations must make progress on gender equity if they are to continue receiving NHMRC funding.

Although linking research funding to participation in Athena SWAN is one way of encouraging organisations to participate, at this early stage such a suggestion risks undermining the good will that is needed to establish Athena SWAN. It will take some time to develop the approach and get the systems in place that are required to establish and grow Athena SWAN in Australia, and as such pursuing links to research funding should not be seen as a priority at this stage. Instead, encouraging organisations to use Athena SWAN as a way to demonstrate their commitment to improving gender equity would be a more positive approach.

What might be unintended consequences of introducing Athena SWAN in Australia?

There are concerns that the additional workload of implementing Athena SWAN in departments could unfairly fall to women. Similar to the UK approach, a diverse team that includes senior and early career researchers, both men and women, should be engaged in this work.

While it is probably most realistic to start with a smaller pilot study without any link to funding eligibility, this will mean that expansion across the sector may take a few years, even though the need and desire for change is strong right now. Therefore it will be essential for regular communication, engagement and updates to the whole sector as to how the pilot is progressing and what future participation opportunities will be available in the near future.

Appendix A – workshop program

Day one—25 November 2014

9.00 INTRODUCTION

Professor Brian Schmidt—Australian National University, Academy Council member, and Nobel Laureate

9.30 THE CURRENT GENDER EQUITY LANDSCAPE IN AUSTRALIA

Professor Sharon Bell—Charles Darwin University, Deputy Vice-Chancellor

This overview presentation will show the lack of progress that has been made in regards to gender equity in Australia over the last 20 years. It will identify pinch points in the current system and some of the particular issues that are contributing to the continuing reproduction of an unequal gender division of labour within science, particularly at senior levels. Drawing on her recent research, Sharon will show where the problems are most acute, and highlight examples of where progress has been made.

10.15 TACKLING GENDER EQUITY CHALLENGE FROM WITHIN THE SECTOR—THE ATHENA SWAN CHARTER

David Ruebain—UK Equality Challenge Unit, Chief Executive

David will present an overview of the UK Athena SWAN Charter, outlining how the charter functions and how it has led to improvements in gender equity within science in the UK. He will:

- introduce the Equality Challenge Unit and provide a brief history of the Athena SWAN Charter for Women in STEMM
- explain the charter's principles and overview of methodology
- show how widespread take-up of the charter has been achieved and the level of uptake by research funders and organisations
- demonstrate the difference between the Athena SWAN Charter and other initiatives, with particular emphasis on showing how the charter is not another 'box-ticking' exercise but leads to real and substantial changes.
- describe how the charter has expanded both within the UK and overseas
- link the charter to higher education funding and consequences
- explore the impact of the charter
- propose how a pilot study might be developed for Australia

11.05 TEA AND COFFEE BREAK

11.20 MAKING A REAL DIFFERENCE—THE ATHENA SWAN CHARTER IN ACTION

Sarah Dickinson—UK Equality Challenge Unit

Professor Tim Wess—Charles Sturt University

An overview of the Athena SWAN processes will be given from both the perspective of the Equality Challenge Unit and from that of a university. This will include the peer review process, evaluation and award time cycles, and how feedback is provided to applicants. Information on the data and evidence required to apply for an award and how to incorporate changes or improvements within the workplace will also be included. Case studies will be used to highlight how the process works and how improvements in gender equality are achieved. Sarah will also consider challenges to the process and considerations specific to different disciplines.

12.15 INTRODUCTION TO WORKSHOP DISCUSSION

Professor Nalini Joshi FAA—University of Sydney, Academy Council member, Georgina Sweet—Australian Laureate Fellow

Participants will join different breakout groups to explore in detail the main issues surrounding gender equality in Australia, and how the different barriers that need to be overcome to establish an Athena SWAN-like initiative. Each group will be given a theme to work on and a set of questions to explore.

Participants will delve deep and explore each topic and come back with (i) topical issues and examples in the Australian context; (ii) whether and how this topic has impacted on female researchers in their employment context, and variations for different sectors; and (iii) ideas for actions that will lessen such impact and encourage female researchers to stay in research.

12.30 LUNCH BREAK

1.15 WORKSHOP BREAKOUT GROUPS

A group rapporteur will give a brief ten minute presentation to start the discussion. They will chair and summarise the findings of each group. David Ruebain and Sarah Dickinson from the UK Equality Challenge Unit will move between the groups to offer their opinion and expertise.

Group 1—Employment practices discouraging women from staying in the scientific workforce (Rapporteur—Professor Sharon Bell)

Group 2—The gendered nature of leadership, in the context of what is required to make the transition from being a ‘leading researcher’ to being a ‘research leader’ (Rapporteur Rapporteur—Professor Nalini Joshi)

Group 3—The ideal scientific researcher: what we value in researchers and metric-based measures for judgement (Rapporteur—Professor Caroline McMillen)

Group 4—How to change culture to be more accepting of time-out periods (Rapporteur—Professor Brian Schmidt)

Group 5—Mobility across sectors (Rapporteur—Dr Marguerite Evans-Galea)

Group 6—The Athena SWAN approach: advantages and disadvantages (Rapporteur—Dr Roslyn Prinsley)

Group 7—Differences across STEM disciplines—do they warrant different actions? (Rapporteur—Professor Jenny Martin)

2.45 TEA AND COFFEE BREAK

3.10 RAPPORTEURS’ REPORT

Chair—Professor Brian Schmidt

Each rapporteur will provide a brief report back to the workshop as a whole. A summary of the day’s proceedings and findings will be given.

4.30 DAY ONE CLOSE

5.00 SOCIAL EVENT—DRINKS AND CANAPES

Sponsored by Newcastle University—Workshop participants are invited to the Double Drummer to enjoy drinks and canapés between 5pm and 6pm. The Double Drummer is located at 2-4 National Cct, Barton and is next door to the workshop venue.

Day two—26 November 2014

9.00 INTRODUCTION

Presenter Professor Nalini Joshi FAA—University of Sydney, Academy Council member, and Georgina Sweet Australian Laureate Fellow

A brief summary of the previous day’s proceedings and an overview of the program for day two by workshop co-chair Professor Nalini Joshi.

9.10 ADDRESSING THE LOSS OF WOMEN FROM MEDICAL RESEARCH—NHMRC’S PLANS

Presenter Professor Warwick Anderson AM—Chief Executive Officer, National Health and Medical Research Council

Dr Saraid Billiards—Director, National Health and Medical Research Council

9.40 WORKSHOP BREAKOUT GROUPS

Participants will then join different breakout groups and will explore issues not covered on Day One. David Ruebain and Sarah Dickinson from the UK Equality Challenge Unit, and steering committee members Professors Sharon Bell and Caroline McMillen, will move between the groups to offer their

opinion and expertise.

Group 1—How to adapt an Athena SWAN type program to the Australian context (Rapporteur—Professor Jenny Martin)

Group 2—What do we define as success in an Athena SWAN type program? (Rapporteur—Dr Roslyn Prinsley)

Group 3—Designing a pilot study (Rapporteur—Professor Brian Schmidt)

Group 4—Gender equity framework across different sectors (Rapporteur—Dr Marguerite Evans-Galea)

Group 5—Local versus global actions for change (Rapporteur—Professor Nalini Joshi)

11.10 TEA AND COFFEE BREAK

11.30 RAPPORTEURS' REPORT

Chair—Professor Jenny Martin—University of Queensland, Australian Laureate Fellow, and member of the NHMRC Women in Health Sciences Committee

Each rapporteur will provide a brief report back to the workshop as a whole. A summary of the day's proceedings and findings will be presented by the workshop co-chair Professor Nalini Joshi.

12.15 RECOMMENDED STEPS AND PRIORITIES

Chair—Professor Brian Schmidt

Following the feedback received from the breakout groups, an overview of the recommended steps and priorities will be suggested. Participants will have an opportunity for questions and discussion.

14.00 DAY TWO CLOSE

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