

Women in Mathematics Special Interest Group (WIMSIG)

2015/2016 Annual Report to the Australian Mathematical Society

November 7, 2016

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This report includes activities from September 2015 to October 2016.

1 Executive Committee

- Lesley Ward, Chair
- Giang Nguyen, Treasurer
- Joanne Hall, Secretary
- Lynn Batten, Committee Member
- Deborah Cromer, Committee Member
- Asha Rao, Immediate Past Chair

2 Events

WIMSIG currently supports three types of events: Women in Maths Gatherings, Embedded Events, and Endorsed Events.

2.1 Women in Maths Gatherings

WIMSIG organised nine Women in Maths Gatherings around the country in the last year. Funding was provided by the host organisations.

- November 2015 Gatherings were hosted by UAdelaide, QUT, Monash and USyd.
- June 2016 Gatherings were hosted by Flinders University, UTS, UQ, UCanberra and UTas.

These Gatherings are open to people of any gender. They provide a venue for discussion of gender equity and are a great way to build informal networks.

The Gatherings are well supported by the host organisations. In each case the host organisation provides a venue and catering. Some events have been attended by Heads of Schools and other influential decision-makers.

2.2 Embedded events

WIMSIG actively supported women's gatherings at four national events, in most cases funded by the event. Members of the WIMSIG Executive Committee took lead roles in many of these events.

- September 2015: Women in Mathematics Dinner at 59th AustMS Annual Meeting, Flinders University (Funded by Nalini Joshi's ARC Georgina Sweet Laureate Fellowship)
- January 2016: Women in Mathematics Lunch at ANZIAM (Funded by Nalini Joshi's ARC Georgina Sweet Laureate Fellowship)
- January 2016: Women in Mathematics evening at AMSI Summer School
- July 2016: Women in Mathematics Networking Event at AMSI Winter School

The above four events have each been held for the past two or three years. Planning is under way for the following Women in Maths events, to be held in the next few months.

- Nov/Dec 2016: Women in STEM lunch at BioInfoSummer, University of Adelaide
- December 2016: Women in Mathematics Dinner at 60th AustMS Annual Meeting, ANU (Funded by Nalini Joshi's ARC Georgina Sweet Laureate Fellowship)
- January 2017: Women in Mathematics Lunch at ANZIAM Annual Conference (Funded by Nalini Joshi's ARC Georgina Sweet Laureate Fellowship)

2.3 Endorsed events

WIMSIG endorsed several conferences, workshops and lectures organised by others. See the full list at <http://www.austms.org.au/WIMSIG+Events>.

WIMSIG is happy to advertise to our membership any conference or workshop that has specific and suitable measures in place to increase female participation. Such measures could include female invited speakers, women's gatherings, financial incentives (travel funds or reduced registration), suitable arrangements for childcare upon request, or any other efforts to attract female participants.

WIMSIG's advice sheet for organisers of such events is available at <http://www.austms.org.au/WIMSIG+Events>.

3 Advocacy

3.1 Written submissions

The Women in Mathematics Special Interest Group consults with a number of organisations wanting to increase the participation of women in their

particular jurisdiction. WIMSIG considers this to be an important service to the mathematical community. In each case WIMSIG endeavours to write a formal written response.

- 12 May 2016: Letter to AustMS Council regarding a suggestion to adapt the London Mathematical Societies Good Practice Scheme. See Section 10 for further discussion.
- 8 June 2016: Letter to organisers of Simon Marais Mathematics Competition, commenting on their draft proposal for a new high-school mathematics competition.
- 15 June 2016: Letter to AMSI Board regarding female representation on event organising committees.
- 15 Sept 2016: Letter to B.H. Neumann prize committee regarding impact of selection processes on the number of female students nominating to be considered for the prize.

3.2 Presentations

- **Annual Council of Heads of Schools of Mathematical Sciences:** The Chair of WIMSIG (Ward) gave an invited talk: *WIMSIG Report, and Hot Topic: Gender Equity* at the ACHMS meeting, 17 February 2016. Her slides are posted at <http://www.austms.org.au/WIMSIG+Events>. Highlights:

- Data on rates of participation by women in the tertiary sector in Australia, by discipline and by level (Bachelors/Honours/PhD/Casual/A/B/C/D/E). Data from the 2014 AMSI Survey (24 universities) indicate the percentages of women among those completing degrees, and those employed, in the mathematical sciences: Bachelor completions 41%, Honours 38%, PhD 37%, Casual teaching 32%, Level A 29%, B 31%, C 25%, D 19%, E 9%. These percentages are lower than those for the aggregated natural sciences, which are themselves lower than for all other discipline groupings.
- Request to Heads of School to send jobs ads to WIMSIG, through the email address WIMSIG-secretary@women.austms.org.au. We publicise them through the WIMSIG newsletter and website.
- Known mechanisms that diminish gender equity. Focus on *implicit bias* and how it plays into evaluations throughout an academic career.
- Example 1: The “Jennifer and John” study, Moss-Racusin et al., PNAS 2012. US biology, chemistry and physics professors

($n = 127$) evaluated application materials of an undergrad applicant for a lab manager position. The applications were identical except that half ($n = 63$) had a male student name and half had a female student name. **The professors consistently rated the “male” student higher on (1) competence, (2) hireability, (3) how much mentoring they would offer the student, and (4) how much starting salary: 14% more than for the “female” student.** These differences were statistically significant. Professor gender, scientific field, and tenure status were not significant.

- Example 2: Double-blind reviewing (neither author nor reviewer identity are revealed) was introduced by the journal *Behavioral Ecology* in 2001. “Following this policy change **there was a significant increase in female first-authored papers**, a pattern not observed in a very similar journal that provides reviewers with author information. No negative effects could be identified, **suggesting that double-blind review should be considered by other journals.** —*Budden et al., Trends in Ecol. and Evol. 23 (2008), no. 1, 4–6.*
- Practical measures that Heads of School and others can adopt to promote gender equity, especially the Harvard Implicit Association Test.

- Hosted RMIT Women in Research Network Presentation: Peer Mentoring for Women going for Promotion, 27 Apr 2016. Speaker: A/Prof Birgit Loch. Asha Rao introduced the speaker and spoke about WIMSIG’s efforts in supporting women in research in the mathematical sciences.

3.3 Media Interviews

In April the University of Melbourne advertised three positions in the Department of Mathematics, open for female candidates only. This incited quite a bit of media discussion. Lesley Ward (Chair of WIMSIG) conducted several interviews with journalists for print, online and radio media.

ELECTRONIC & PRINT

- ABC’s PM program, 18 May 2016: *Melbourne University advertises female-only jobs in bid to remedy gender imbalance in maths*
- The Age, 19 May 2016: *Melbourne Uni offers women’s-only maths jobs*

RADIO

- The Wire 101.5fm Adelaide, 20 May 2016: *Women-only Math Jobs Offered by University of Melbourne*

- QUT News on 4EBfm, 19 May 2016 at 1pm
- SYN90.7 Panorama, 19 May 2016 at 4pm
- SBS Radio Hindi, aired about 28 May 2016.

4 WIMSIG Delegates

WIMSIG currently nominates a member of the Programme Committee for the following events.

- AustMS Annual Meetings
- Engineering Mathematics and Applications Conference (EMAC)

These nominations have been at the invitation of the event organisers, and are done with the intention of helping to increase diversity of keynote speakers. We are willing to help in similar ways for other recurring conferences and one-off events.

4.1 Connections with other organisations

- *AMSI*. The Chair of WIMSIG has a bimonthly meeting with Cate Parsons, AMSI Project officer. On occasion the meeting also involves other AMSI staff such as Geoff Prince, Inge Koch, Paul Ulrick, Simi Henderson, Maaïke Wienk, Anne Nuguid, and Lauren Draper. Items discussed include data on women's participation in Australian University mathematics, women's gatherings at AMSI flagship events, female representation among speakers and event committees.
- *AMSI Choose Maths*. WIMSIG Chair Lesley Ward attended the launch of the Choose Maths project 28 April 2015. Committee member Asha Rao attended the Choose Maths Awards, 26 August 2016.
- *Australian Academy of Science and Australian Academy of Technology and Engineering*. WIMSIG Executive Committee members Lesley Ward and Joanne Hall attended the SAGE Symposium, at the Australian Maritime Museum, 24 June 2016.
- *Australian Astronomical Society*. Executive Committee members Lynn Batten and Asha Rao attended the Diversity in Astronomy Conference, hosted by the University of Melbourne, 28–29 June 2016.
- *Science Meets Parliament 2016*. Executive Committee Members Lesley Ward (nominated and funded by AMSI) and Giang Nguyen attended Science Meets Parliament, 1–2 March 2016.

- *Women in Technology WA*. WIMSIG Webmaster Amy Glen attended a Women in STEM Roundtable Meeting and Morning Tea at Government House in Perth, hosted by Her Excellency the Hon Kerry Sanderson AO (Governor of Western Australia) upon the invitation of Professor Lyn Beazley (Science Ambassador and WA Australian of the Year 2015), 11 October 2016.

4.2 Newsletter

The Women in Maths Newsletter is a monthly newsletter containing information of interest to members of WIMSIG. The Newsletter is delivered via a mailing list and posted on the WIMSIG website, and is edited by Joanne Hall, WIMSIG Secretary. <http://www.austms.org.au/WIMSIG+News>

The aims of the newsletter are to inform the WIMSIG membership of the activities of WIMSIG, and to stimulate discussion about gender equity in the mathematical sciences. The newsletter is published on the first or second day of each month and is divided into news, events, opportunities, media and research sections.

The news section contains information about the activities of WIMSIG as well as news about female mathematicians who have done something interesting anywhere in the world, and gender equity projects of interest. The secretary receives news tips from many members as well as written articles.

The events section advertises events in the mathematical sciences and events focussed on Women in STEM. WIMSIG has developed an advertising policy, and only advertises events that meet our guidelines.

The opportunities section advertises jobs, scholarships and volunteer opportunities. Some research organisations now have a written process that includes notifying WIMSIG whenever they have a position to advertise. We encourage all organisations to notify WIMSIG when they advertise a position. The positions will be advertised in the newsletter until the closing date. We have received feedback from our members that some have heard about opportunities in our newsletter first, and seeing an opportunity advertised in our newsletter motivated them to apply.

The media and research sections contain links to media and scholarly articles about women in STEM.

To join WIMSIG and receive the newsletter every month, send a request to WIMSIG-secretary@women.austms.org.au.

4.3 Website

www.austms.org.au/Women+in+Mathematics+group

The WIMSIG website is maintained by WIMSIG Webmaster Amy Glen. The website contains newsletters, event advertisements, job advertisements, a funding directory, resources on gender equity in STEM, Q&A with female mathematicians, information about the Hanna Neumann Lecturers and links to the Praeger and Street Awards.

The Job Advertisements and Event Advertisements pages are becoming busier, as more organisations and event managers request an advertisement. Advertisements for jobs or events are done at no cost providing the organisation or event meets our advertising policy. Some research organisations now have a written process that includes notifying WIMSIG whenever they have a position to advertise. Positions will be advertised on the website until they close. For some opportunities (such as the UON Women in Science Chair) a WIMSIG committee member personally contacts people whom the committee deems suitable.

The Gender Equity resources section of the website contains links to a variety of scholarly and media articles articulating some of the issues of women in mathematics or more generally women in STEM.

The Q&A section of the WIMSIG website contains interviews with the female plenary speakers at AustMS and ANZIAM meetings since 2013: <http://www.austms.org.au/WIMSIG-QA>.

5 Projects

5.1 Travel Awards

Since the 2015 Annual report, there have been three rounds of AustMS WIMSIG Travel Awards, with closing dates of Round 3: October 2015, Round 4: 1 April 2016, and Round 5: 1 October 2016). The latest round (Round 5) is still being finalised. Below is the report for Rounds 3 and 4.

In these two rounds (Rounds 3 and 4), we received nine applications for the Cheryl E. Praeger Awards and three applications for the Street Awards. The rules for the Street Awards have now changed to permit applications from event organisers for funding to support childcare at their events. We have not yet received such Street applications.

The Selection Committees consisted of Amie Albrecht (Chair), Deborah Street, and Barbara Maenhaut for Round 3, and Deborah Street (Chair), Barbara Maenhaut, and Yvonne Stokes for Round 4. The selection Committee for Round 5 consists of Barbara Maenhaut (Chair), Yvonne Stokes, and Joanna Wang.

During the reporting period there were eight Praeger awardees and two Street awardees.

AustMS WIMSIG Cheryl E. Praeger Travel Award:

R3 Emma Carberry (USyd), Visitor to USyd from Germany

- R3 Deborah Cromer (UNSW), Wellcome Trust Conf + Research visit, UK, 2015
- R3 Chaitanya Oehmigara (ANU), MODSIM, Australia, 2015
- R3 Melissa Tacy (Adelaide), Evolution of Singular Spaces + Research visit, France, 2016
- R3 Elena Tartaglia (UMelb), ANZ Assoc. Math Physics, Australia, 2016
- R4 Sangeeta Bhatia (Western Syd Uni), SIAM conf on Life Sciences + Research visit, US, 2016
- R4 Rachael Quill (UNSW), 5th International Fire Behaviour and Fuels Conference, Australia, 2016
- R4 Nadezda Sukhorukova (Swinburne), Mathematical Optimization Down Under, Australia, 2016

AustMS WIMSIG Anne Penfold Street Award:

- R3 Emma Carberry (USyd), Visitor to USyd from Germany
- R3 Deborah Cromer (UNSW), Wellcome Trust Conf + Research visit, UK, 2015

One Praeger awardee (Bhatia, Round 4) was unable to travel as planned, due to factors beyond her control, and so the funds originally allocated to her are now available for Round 5.

5.2 WIMSIG Conference 2017: Celebration of Women in Mathematics

WIMSIG is organising Australia's first women-in-mathematics research conference. The *WIMSIG Conference: Celebration of Women in Australian Mathematics* will take place on **24–26 September 2017**, at the University of South Australia. The conference is open to people of any gender, but all the research talks will be given by women.

The conference will include plenary speakers, parallel special sessions, a poster session, a professional development workshop, a conference dinner, and a panel discussion on gender and mathematics. The themes of the special sessions will range across the mathematical sciences, broadly defined, including areas of applied maths, pure maths, statistics, biostatistics, and mathematics in industry.

We are submitting a funding proposal for joint consideration by the AustMS, AMSI, ANZIAM and SSAI, requesting their support of the Conference. We have already raised some funds from other sources and have developed a sponsorship prospectus aimed at attracting corporate funding.

The Conference Steering Committee consists of Lesley Ward (UniSA, WIMSIG Chair), Giang Nguyen (Univ. of Adelaide, WIMSIG Treasurer), Lynn Batten (Deakin Univ., WIMSIG Exec Committee), and Sue Tyerman (Admin, UniSA). The Conference website, including a call for expressions of interest, is at <http://www.austms.org.au/WIMSIG-conference-2017>.

5.3 Proposed online archive of Hanna Neumann's work

Subsequent to the development of an online archive of Kurt Mahler's work, the Society invited suggestions for the establishment of similar archives for the work of other distinguished mathematicians.

WIMSIG has taken some initial steps towards establishing an online archive of Hanna Neumann's work. The Society has expressed its support for this project.

6 Membership

The WIMSIG membership list and mailing list are maintained by WIMSIG Secretary Joanne Hall. WIMSIG currently has 342 people on the mailing list, of whom about 181 are members of the AustMS.

Membership is approximately 86% female and 14% male.

7 Elections

The 2016 WIMSIG Election round is now underway. The current Chair and Secretary intend to step down from these roles on the Executive Committee, when their current terms end on 31 January 2017. Some members of the current Executive Committee intend to re-nominate.

The WIMSIG Executive Committee has drafted some changes to the Rules of Procedure. These proposed changes will bring the process, and especially the timing, for the appointment of the Chair of WIMSIG in line with those for the appointment of the President of the Society, and for the leadership roles of many other organisations. According to the current Rules and Procedures, the new WIMSIG Chair is elected in December and takes office almost immediately, on the following 1 February, serving as Chair for two years and then as Immediate Past Chair for two further years. We propose that the election for the Chair of WIMSIG be held one year before the elected candidate takes up the position of Chair. In this way the Chair will spend one year as Chair-Elect, two years as Chair and one year as Past Chair.

The Chair of WIMSIG is a high-profile role, and one that would benefit from a shadowing period. Over the past four years, since its inception, the Women in Maths Special Interest Group has completed several successful

projects and has become better known amongst the Australian mathematical sciences community. These successes have led to more invitations for the WIMSIG Chair to attend events, speak at events, meet with industry people and do media interviews.

In order to change the Rules of Procedure a vote must be held. This vote will take place at the same time as the current election of the 2017–2018 Executive Committee. Members of WIMSIG who are current members of the Society will receive a separate invitation to vote on this matter.

8 Funds

In 2015, WIMSIG submitted a three-year funding proposal (2015–2017), and was approved funding for

- \$3,200 for operational purposes, including travel money to attend events for advocacy (the session 2015–2016)
- \$20,000 for the Cheryl E. Praeger Travel Awards (FY 2016–2017)
- \$3,000 for the Anne Penfold Street Awards (FY 2016–2017).

A summary of expenditures, and WIMSIG’s future funding request, have been prepared as a separate document by the WIMSIG Treasurer Giang Nguyen.

9 ★ Future funding source for Women in Maths Events at AustMS and ANZIAM annual meetings ★

A Women in Mathematics Dinner has been held at each AustMS Annual Meeting beginning in 2013, and a Women in Mathematics Lunch has been held at each ANZIAM annual Conference since 2014. WIMSIG assists with these events, working with local organisers and providing an MC. These events have been funded by Prof. Nalini Joshi’s Georgina Sweet Laureate Fellowship. The duration of this funding source is five years. Hence, beginning with AustMS 2018 and ANZIAM 2019, a new source of funding will be needed to continue with these events.

These Women in Mathematics events have highlighted the female plenary speakers and given an opportunity to discuss gender equity to an open audience. (The events are open to people of any gender.) They also help foster a sense of community and belonging, which is especially valuable for minority groups at large events. **We request that the Society consider supporting these events into the future by including these events in the event budgets for future AustMS and ANZIAM annual meetings.**

10 ★ Good Practice Scheme ★

In 2015 AustMS Council suggested that the Women in Mathematics Special Interest Group adapt for Australia the London Mathematical Society's Good Practice Scheme. The WIMSIG Executive Committee has discussed this suggestion and has decided that **WIMSIG will not undertake this project.**

The Science Australia Gender Equity (SAGE) initiative is currently being rolled out, with well over half of Australian universities participating in the initial pilot project. WIMSIG is already actively supporting SAGE. In addition many of our volunteers are involved in the implementation of SAGE within their own institutions. Adapting the LMS Good Practice Scheme may duplicate some of the SAGE project, which is not a valuable use of our volunteer resources. When the pilot phase of SAGE is complete, we may re-evaluate this position.

We recognise that a Good Practice Scheme could have a significant impact, and indeed we note the recent award to the London Mathematical Society of the inaugural Royal Society Athena Prize, in recognition of accomplishments including the LMS Good Practice Scheme; see <https://www.lms.ac.uk/news-entry/12102016-1053/lms-wins-prestigious-athena-prize>. It is worth noting that aspects of the LMS Good Practice Scheme ultimately formed part of the UK's Athena SWAN charter, which in turn is the model for Australia's SAGE initiative.

If AustMS Council is still keen on the project of a Good Practice Scheme in mathematics, then **we suggest that Council set up a committee for this express purpose.** We believe that such a project would be most successful if undertaken by the Society as a whole, not only by WIMSIG. WIMSIG would be supportive of such a committee, and would be happy to contribute (for instance by recommending potential participants), but will not be taking responsibility for the project.

Joanne Hall
Secretary
Women in Mathematics Special Interest Group
Australian Mathematical Society
4 November 2016

11 Appendix: Travel Award Reports, Rounds 1–4

On the following pages we present the reports by all recipients to date of the AustMS WIMSIG Cheryl E. Praeger Award and the AustMS WIMSIG Anne Penfold Street Award. For completeness we have included the Round 1 and Round 2 reports (which were not given in full in last year's Annual Report), as well as the current Round 3 and Round 4 reports.

Round 1: Vivien Challis (P)

Round 1: Joan Licata (P & S)

Round 1: Valentina Wheeler (P)

Round 1: Sylvia Young (P)

Round 2: Adelle Coster (P & S)

Round 2: Hang Wang (P)

Round 3: Emma Carberry (P & S)

Round 3: Deborah Cromer (P & S)

Round 3: Chaitanya Oehmigara (P)

Round 3: Melissa Tacy (P)

Round 3: Elena Tartaglia (P)

Round 4: Rachael Quill (P)

Round 4: Nadezda Sukhorukova (P)

Travel report for AustMS Cheryl E. Praeger Travel Award – Vivien Challis

A Cheryl E. Praeger Travel Award for \$600 from the Women in Mathematics Special Interest Group of the Australian Mathematical Society covered most of the registration fee for me to attend the ANZIAM 2015 conference on the Gold Coast. I enjoyed attending and giving a talk at this meeting. It was great to have the opportunity to connect with new and old friends within the Australasian applied mathematics community, especially after taking a recent break for maternity leave.

ANZIAM 2015 had an impressive list of invited speakers, including five women. This was really great to see. The Women in Mathematics Special Interest Group held a lunch during the conference (funded by Prof. Nalini Joshi's ARC Georgina Sweet Laureate Fellowship). This was an excellent opportunity to hear views of the female invited speakers and highlight issues that are important to female applied mathematicians, as well as to mathematicians with parenting or other caring responsibilities.

Report:

I am grateful to the Australian Mathematical Society for supporting my recent research trip to the United States and Hong Kong. In December I travelled to the University of Georgia, USA, to visit a collaborator there. We've been working on a project together for a year and a half, with only a few opportunities to speak in person. This visit offered us the chance to resolve some technical issues in the first stage of our project, and we expect to have the paper finished early this year. We also laid the groundwork for a new paper on two-parameter families of Morse functions which we will continue to work on remotely. Right after the New Year, I visited the Chinese University of Hong Kong, giving a series of graduate talks and speaking in a special workshop on low-dimensional topology. The Chery E. Praeger Award was extremely valuable in defraying the costs which weren't covered by my hosts. In addition, my two-year-old son travelled with me to Georgia, and the Anne Penfold Street Award covered the cost of his childcare while I was working there. I am extremely appreciative for this support in the dual challenge of being a mathematician and a parent.

Joan Licata

AustMS WIMSIG Cheryl E. Praeger Travel Award

Valentina-Mira Wheeler - Report

The travel award facilitated my attendance at the 8th ANZ Maths Convention in Melbourne. At the invitation of A/Prof Daniel Daners I delivered a talk titled “Mean curvature flow with free boundaries and the use of Killing vector fields in Euclidean space” in the Special session in Harmonic Analysis and PDE.

<http://www.austms2014.ms.unimelb.edu.au/>

This conference is the combined meeting of the [AustMS](#) and [NZMS](#) held every six years and is a high-quality event in mathematics in Australia and New Zealand. It has allowed me to publicise my results to the larger mathematical community and promote my work as a young female early career mathematician.

The conference was attended by many mathematicians in my field, as for example Daniel Daners, Julie Clutterbuck, Florica Cirstea, Maria Athanassenas, Jerome Vetois, Thierry Coulhon, Adam Sikora, Daniel Hauer, and many others allowing me to connect with peers and possible new collaborators, both Australian and European.

The results I presented treat the setting of a mean curvature flow solution with free boundaries. A section of my talk has also referred to the more complicated family of fully nonlinear curvature flow with free boundaries.

Presenting my results allowed me to obtain valuable feedback on my work in later discussions with Daniel Daners, Maria Athanassenas, Florica Cirstea, Julie Clutterbuck and Pierre Portal.

The conference also exposed me to different aspects of mathematical analysis, for example mathematical biology, geometry and topology, and computational mathematics; with results presented in other special sessions and plenary talks.

I enjoyed my time in Melbourne very much and I hope that I will be able to take advantage of another such prestigious travel award in the future.

Report to Australian Mathematics Society Cheryl Praeger Travel Award Committee

– Visiting the University of Wisconsin – Madison, the US

(September 29th to November 13th, 2015)

Dr. Sylvia Young

Research Fellow at the University of Western Australia

Honorary Fellow at the University of Melbourne

Dear AustMS Cheryl Praeger Travel Award Committee,

Receiving the Australian Mathematics Society Cheryl Praeger Travel Award was undoubtedly a turning point in my career. I applied for the Award as an Honorary Fellow at the University of Melbourne. In late 2014, I heard from the Award selection committee that I was selected as an inaugural recipient of the Award. Soon after, I was offered a Research Fellow position by the University of Western Australia. I left Melbourne, and moved to a completely new city to me – Perth, in January 2015.

Thanks to the funds from the Award, as well as an invitation from Professor Daniel Gianola, I had an opportunity to visit the University of Wisconsin- Madison in the United States from September 30th to November 11th 2015. I have been admiring Professor Gianola's contributions to the developments of statistical genetics since the second year of my PhD candidature. However, I have never had a chance to meet with Professor Gianola in person previously. My PhD project was about modeling the mathematical association between genotypes and phenotypes in dairy cattle data. Although my current projects in Perth are more focused on genome-wide association study on human diseases, some state-of-the-art modeling methods can be commonly used in both animal and human data. Fortunately, the University of Wisconsin - Madison would have a course on “Prediction of Complex Traits Using Whole Genome Markers” exactly during my stay, which was lectured by Professor Gianola himself ! Therefore, the six-week course and a collaborative project made the major parts of my visit to Professor Gianola.

UW-Madison was esteemed for its outstanding expertises in statistics, genetics, biology and animal sciences. Professor Gianola is a leading statistical genetist with broad interests in complex traits of plants, animals and human. He also kindly offered a good number of new connections between me and statisticians on campus, some of which are well known, such as Professor Grace Wahba – a pioneer of “smoothing spline” and still an active statistician in her eighties, and Professor Brian Yandell – an amazingly knowledgeable statistician and the past chair of Department of Statistics at UW-Madison. Professor Daniel Gianola, together with his colleague Professor Guilherme Rosa in the Department of Animal Sciences and Professor Brian Yandell in the Department of Statistics, became my important mentors in Madison.

Three mentors and I had a meeting and decided to implement the models in Professor Gianola's lectures on one of datasets that I was working on. Results from those models would be benchmarks for my project. In order to extend conventional model, we discussed on how to improve the genomic prediction models by adding in interactive terms between genetic variants. This would be a second step in my research.

Madison professors taught me a lot. They have corrected some of my wrong unstandings, and guided me through how to choose appropriate ways to achieve research goals. Not only the techniques that I learned during my visit, but also the approach to develop research, were the precious harvests in my visit. My goal is to enhance the collaboration that we built, and to work towards joint publications with my Madison mentors in next years.

Apart from the above, I also visited Professor Alan Attie's group on Madison campus. The Attie's lab belonged to Department of biochemistry. It seemed different from my background. But the Attie's lab and our lab in Australia have a common interest, i.e., we both use mice models to study how to cure human diabetes. Even if my major tasks were about human GWAS, the mice experiments in the Attie's lab were greatly interesting to me. Thanks to the permission by Professor Attie, I had attended their group meetings every week. I found that they had an excellent way to perform their

study, which was to closely collaborate with statistical collaborators. Statistical collaborators would participate in their weekly meetings. Statistician made suggestions either on how to proceed with the analysis, or on the experiment design from the beginning. The research in the Attie's lab has significantly benefitted from this intense link with statisticians.

I also had extensive conversations on Madison campus. There were 16 individual meeting between myself with 8 statisticians during my 6-week stay in Madison. They were all excellent researchers, with strong expertise as well as strong personality. Professor Karl Broman, the author of package “qtl” in R software, was a representative example. He was fast-minded and picked up ideas so quickly. He was warm hearted, but never smiled. When he knew the answers to my questions, he would tell in details, such as the code. In case of questions that he was not in his areas, he would directly say “sorry I can not help you.” He always replied to my emails, even though he was extremely busy with many demanding projects. I went to his seminar once. His slides were so cool that they made audience (at least, me) feel like watching a movie in a cinema. In fact, his slides were written in a particular programming scripts (D3.js, JavaScript for interactive data visualization in web browsers which is quite different from Java) that required a big amount of efforts. He opened my eyes.

I gave two seminar to two groups in Madison. My first seminar was for the Attie's lab in the second week after my arrival. My second seminar was for Gianola's group in the last week of my visit. The topics of my seminars were both supposed to be about introducing my research in earlier this year in Australia. Interestingly, the slides in my two talks were slightly different. Unclear or incorrect terminologies in the first talk had been amended in the second talk – this was an evidence that my visit provided me with a chance to review my research.

I call my journey to the US a peer-reviewing trip. This is because my Madison professors are all leading experts in the field. They could highly likely be acting as reviewers when I submitted my work to journals. When I landed in Madison, how I wanted to convince them that my research was sound and deserved to be published. Soon I found that a lot of questions needed to be properly addressed before publishing my work. Thanks to their guide, I am currently doing my projects in a benchmarking way. For every single terminology that I corrected in my context, I would remember. I felt fortunate to have realized them during my academic visit, rather than after submitting my work. Please join me to thank the Madison professors who have put efforts in mentoring a visitor from Australia.

Sincerely yours,

Sylvia Young

written at the University of Western Australia

December 13th, 2015

Report on the Society for Mathematical Biology Meeting
June 30 to July 3 2015
Atlanta, Georgia, USA

After a delay due to aircraft maintenance and thus an overnight sojourn in Dallas on the way to Atlanta, I arrived in time to be present at the SMB Executive Board meeting on June 29. I answered some of the committee members' queries regarding the progress our committee had made towards the 2018 SMB meeting which is to be hosted at the University of Sydney. They were pleased and we are looking forward to hosting a large international contingent at the meeting.

In the area of mathematical biology many times your collaborators and co-authors are biologists rather than mathematicians, so this forum was very useful to network with other like-minded mathematicians.

There was quite a reasonable international representation at the meeting, although naturally the largest cohort was American. Indeed there were many antipodeans, showing the active nature of this area of mathematics in Australia.

The plenaries of the meeting itself were excellent with a wide range of topics in mathematical biology covered. Unfortunately, only 2 of the 9 were from female speakers, although the female representation at the meeting as a whole was much higher than many other mathematical conferences. Eve Marder was particularly inspiring – she is a biologist, but is one who sees the absolute necessity of modelling and mathematics in the understanding of how information is processed and decisions are made in biological function. Her presentation about degeneracy in neuronal oscillators touched on the interplay of experiment and modelling, and how individual responses should not always be averaged – difference being an important driver of differential behaviour.

The sessions, two of which I chaired, were also of high quality and ranged over numerous biological topics and mathematical techniques. Of particular interest to me were several sessions devoted to mathematical modelling in diabetes. It was wonderful to be able to see the progress being made on a number of fronts in this area as well as to meet and reconnect with researchers, some of whom I knew previously, but others only from their publications. My presentation was well received and I spoke with a researcher from Pfizer about possible future collaborations. I also followed up a previous meeting with Santiago Schnell (now President of the Society for Mathematical Biology), whom I had briefly met at a workshop in Feb 2014. He and his postdoc had followed through with a suggestion that I had made, and it was most gratifying to see that it had indeed provided a good line of investigation. Santiago is also particularly interested in ways to encourage women researchers, and we had a discussion about the AustMS awards I had received and he thought that these were interesting opportunities that the Society should similarly pursue.

I would like to again thank the AustMS WIMSIG for their invaluable support of the Cheryl E. Praeger and Anne Penfold Street Awards, making my participation in this meeting possible.

Adelle Coster
July 2015

Report

Dr. Hang Wang

It is my great pleasure to acknowledge the support from the AustMS WIMSIG Cheryl E. Praeger Travel Award. With this award, I was possible to have a very fruitful 3-week research travel to Montreal and Shanghai.

In the first week (29 June-3 July 2015), I participated the workshop “**Noncommutative Geometry and Spectral Invariants**” at the **Université Du Québec À Montréal, Canada**. During the workshop, experts in noncommutative geometry (NCG) communicated exciting developments in this field. Major topics include index theory and higher analogue for groupoids and applications to manifolds with boundary, spectral triples in different settings, quantum groups and NCG in mathematical physics and representation theory. I am familiar with most topics in the conference so I enjoyed learning from the talks. As one of the invited speakers, I gave the talk “**Noncommutative geometry, equivariant cohomology and conformal invariants**” on **30 July 2015**, based on my series of joint papers with Prof Raphael Ponge (one of the organisers of the workshop). Quite a few mathematicians (Prof Bruno Iochum, Prof Piotr Hajac, Prof Paolo Piazza, etc.) got very interested in our work. It should be noted that I was one of the only two female speakers in the workshop. Besides the successful talk, I initiated some very inspiring discussions with Dr Yanli Song, where we tried to study a previous paper of mine in a new setting, and we have planned an exciting joint project together with my colleague Peter Hochs in Adelaide.

In the second and the third week I visited the Shanghai Centre of Mathematical Sciences at Fudan University in China. This travel was devoted to the collaboration with Dr Kuok Fai Chao, a junior member of the Centre. We made several important progresses on our joint paper about *Base change and K-theory*. In the meanwhile I had some very interesting conversations with members and visitors at the Centre and the University. In particular, I established a new collaboration with a visitor there working in mathematical physics. I also gave several talks in Shanghai. On **10 July 2015**, I was invited to give a talk with the same title as the Canada conference in the research seminar of the **East Normal China University**, hosted by Distinguished Professor Huaxin Lin. There was a Summer School named “**Advance Seminars in Functional Analysis**” hosted by the Centre during my stay. In the afternoons of 15 and 17 July I was invited to work together with Dr Zhizhang Xie from Texas A&M University to host the discussion sessions, in which I introduced some interesting examples to the summer school participants, helping them to understand the lectures. It was a wonderful experience to interact with graduate and senior undergraduate students coming to this summer school from top universities in China.

Finally, I would like to express my deep appreciation of the support from WIMSIG, making these research experiences possible.

Dr Hang Wang
University of Adelaide
22 July 2015.

Report on Cheryl Praeger Travel Grant

Melissa Tacy

I used my Cheryl E. Praeger Travel Grant to partially support a research trip to Germany and France. The first two weeks of the visit were spent at Oberwolfach where I was working with my collaborator Julie Rowlett of Chalmers University as part of the Research in Pairs project. The final week of the research trip was spent at Centre International de Rencontres Mathématiques (CIRM) in Marseilles to attend a workshop on evolution equations on singular spaces.

Research in Pairs

The overall goal of our ongoing joint work is to generalise results in harmonic and semiclassical analysis, such as L^2 and more general L^p estimates of quasimodes (approximate eigenfunctions), to singular geometric settings. The major difficulty in obtaining such results is that the known techniques from smooth manifolds rely heavily on the underlying regularity. We therefore are working to replace these techniques with ones that rely on the geometric structure instead. While at Oberwolfach we focused on the restriction of eigenfunctions to fractal sets, in particular those given by iterated function systems.

Fractal sets provide a good place to start this analysis as, while clearly not smooth, they have a great deal of structure and the self-similarity at all scales is valuable to us. We have been working on this project since July 2015, however being able to work together intensively greatly accelerated our progress. While at Oberwolfach we developed tools to replace the standard smooth toolkit and obtain L^2 estimates restricted to fractals that depend on dimension alone (we already had examples to show that these are in fact sharp bounds). We are currently writing our results from this two week period and plan to continue the work into other non-smooth settings.

While at Oberwolfach we overlapped with the yearly meeting of the “Imaginary” team who develop outreach connected with the institute. As a result of this Julie and I are providing them with some ideas to develop displays on mathematics and music (particularly its connection to harmonic analysis).

Evolution Equations on Singular Spaces

This conference gathered together a number of experts in microlocal and semiclassical analysis to address the issue of moving such analysis to singular spaces. A particular focus is on understanding the effects of boundary and corners. While there I had the opportunity to meet with a number of colleagues and collaborators. In particular with my collaborator Jeff Galkowski from Stanford University, we have previous work on boundary to interior norms of layer potential operators and the effect of boundary geometry of such estimates. During the conference we took the opportunity to discuss further improvements to our work. Following this discussion we are now writing a paper showing under what geometric conditions our previous work can be improved (and where it is sharp).

This conference also offered the opportunity to meet Simon Chandler-Wilde and Euan Spence, two British numerical analysts whose work overlaps my area. Some of my previous results have been of use in controlling error for their numerical techniques and it is becoming increasingly apparent that many of the techniques of semiclassical analysis have much to offer in numerical fields. I have corresponded with Spence before but this is the first time we had met in person. Being able to meet them and learn more about the problems that they are interested in has given me an number of new avenues to pursue in my own research.

**REPORT FOR WIMSIG CHERYL E. PRAEGER TRAVEL
AWARD AND ANNE PENFOLD STREET TRAVEL AWARD**

E. CARBERRY

The funding I received from WIMSIG enabled me to invite my collaborator Prof Martin Schmidt (University of Mannheim, Germany) to visit me in Sydney and to defray the costs of additional childcare during his visit, as I temporarily went from working 3 days per week to working full-time. It was an extremely productive visit and we are now writing up two papers resulting from this intensive research time: Blowing-up Singular Whitham Flows and Constant Mean Curvature Tori in \mathbb{R}^3 . This productivity and recognition has already helped me to achieve further grant success, with the award of a \$60,000 Brown Fellowship for next year, which will relieve me of teaching and administration duties for the year as well as provide some research funding.

It was particularly helpful that the grant was available to facilitate a collaborator visiting me rather than only supporting the reverse situation. As a sole parent of one-year-old twins it would not have been feasible for me to travel to Germany. Indeed even if that had been feasible, the situation of a collaborator doing the travel is more efficient in many ways as it allows the grant recipient to take advantage of existing childcare arrangements and support, rather than having to make temporary arrangements in a foreign country, as well as pay for childcare here whilst absent.

Report for Cheryl E. Praeger and Anne Penfold Street Awards

I received travel funding and childcare support for an extended trip to the UK from 8th October – 14th November 2015 to both attend the Infectious Disease genomics Conference at the Wellcome Trust Conference Centre, Cambridge UK from 14th – 16th October 2015 and to further my research collaboration with Dr Mark Jit at the London School of tropical Medicine and Hygiene.

At the Infectious Disease genomics Conference I presented my work on estimating the *in-vivo* HIV template switching and recombination rate, which was very well received. It was debated by a number of conference participants and the stimulating discussions that followed indicated a strong level of interest in my work at the international level. This was particularly inspiring for me, as I had not had a chance to present internationally recently. The talks I attended have motivated some new directions for my research. In particular I was alerted to a new dataset that we have since already used as evidence for some of our hypotheses in a manuscript under preparation. I had an opportunity to speak directly with a number of people whose work I had previously read and cited, and built up some new networks for potential future collaborations.

During the research visit with Dr Mark Jit we developed a mathematical model to assess the cost effectiveness of childhood vaccination against Respiratory Syncytial Virus. Vaccines against this virus are likely to be available in the next 5-10 years, and our work will act as some guidelines for public health authorities when the vaccines are available for purchase. Our model was based on some previous analysis we had done of the burden of respiratory diseases by age and risk group, and built upon this work. By the end of the research visit we had drafted the majority of the paper and had clear timelines for the remainder of the work. Additionally we have plans for continuing this collaboration into the future.

Since I was out of Australia for over 5 weeks, I could not have made this research visit without taking my two children (3 years and 1 year) with me. I used funds from the Anne Penfold Street Award to pay for babysitting for my children while I was working in London. I used funding from the Cheryl Praeger Award to pay for my flight to the UK and for part of my conference fee.

I am very grateful for both of these awards, as they made a very productive research trip a real possibility through their financial support.

Deborah Cromer

Cheryl E. Praeger Travel Award

Chaitanya Oehmigara-Trip Report

21st International Congress on Modelling and Simulation

Sunday 29 November - Friday 4 December 2015

Gold Coast Convention and Exhibition Centre, Broadbeach, Queensland

I was grateful to receive in November a Cheryl E Praeger Travel Award from the Women in Mathematics Special Interest Group of the Australian Mathematical Society. This award supported my attendance at the 21st International Congress on Modelling and Simulation (MODSIM 2015).

On Monday 30 November I presented a paper in the *Solving Practical Inverse Problems* session titled "Reduced Basis Model Reduction for Statistical Inverse Problems with applications in Tsunami Modelling". I was awarded the Best Student Paper Prize of the Modelling and Simulation Society of Australia and New Zealand for this paper and my presentation.

MODSIM is a broad ranging conference that attracts attendees from a wide range of disciplines. I attended many presentations on topics related to my own areas of mathematical interest (model reduction and solving inverse problems), but that looked at these methods for a range of applications. This has given me many ideas for my own research. Conversely, I went to many very interesting talks on other mathematical areas with very diverse applications, and often saw how my work could be applied there. I made many new contacts who I look forward to working with in the future.

I would like to thank the AustMS Women in Mathematics Special Interest Group and the selection committee for granting me the Cheryl E Praeger Travel Award. Attending MODSIM 2015 has been an extremely valuable experience.

Report for Cheryl E. Praeger

Travel Award

Elena Tartaglia, December 2015

ANZAMP 2015

Due to the generosity of the Women in Mathematics special interest group of AustMS, I was able to attend this year's Australia and New Zealand Mathematical Physics (ANZAMP) conference in Newcastle. This conference attracts many researchers from across Australia and overseas, giving attendees the opportunity to listen to many diverse and high-quality talks from across the field. The opening of this year's conference also included a public lecture given by Nalini Joshi and Cassandra Portelli who spoke about their respective careers in mathematics and the importance of teaching mathematics in a way that allows students to problem solve and explore mathematics for themselves by collaborating in groups.

Benefits of attending the conference

Attending this conference gave me the opportunity to present a talk on my latest work with my PhD supervisor Paul Pearce "Fused RSOS as Higher-level Nonunitary Minimal Cosets." I gave the talk on the 10 December 2015. It was interesting to present my talk to academics from other universities and respond to their questions. I was also able to meet academics from many institutions in Europe, where I am currently applying for postdoctoral positions.

Cheryl E. Praeger Travel Award

Conference Report

Rachael Quill, UNSW Canberra
rachael.quill@student.adfa.edu.au

In April 2016, I attended the 5th Fire Behaviour and Fuels Conference at the Melbourne Convention Centre, with the financial support of the Cheryl E. Praeger Travel Award. The conference was run jointly in Melbourne and Portland, Oregon, with a number of plenary sessions shared between the two locations via video link.

At the Melbourne conference, organised by the International Association of Wildfire Fire (IAWF) in conjunction with the Bushfire and Natural Hazards Cooperative Research Centre (BNH CRC), I gave two presentations that were accompanied by extended abstracts to be published by IAWF (to be available at www.iawfonline.org). These presentations allowed me to communicate aspects of my PhD research to the joint academic and operational fire research community and gain valuable feedback, as well as strengthen my professional network within the industry. With approximately 30% of speakers being female at the Melbourne conference, these presentations also allowed me to contribute to the rising profile of women researchers and practitioners within a traditionally male dominated field.

The first presentation, *Analysing the Impacts of Vegetation and Topography on Wind Fields over Complex Terrain*, was presented in the 'Fire Weather and Climate' stream on Wednesday 13th April. The second, *Evaluation of Operational Wind Field Models over Complex Terrain*, was also presented on the Wednesday but in the 'Fire Behaviour and Fire Behaviour Predictions' stream. Both talks were well received, provoking in-depth discussion during each allocated question time as well as during conference breaks after the talks. During these discussions, I talked with a number of academics, professionals and practitioners from universities and agencies across Australia including Victoria University, the Bureau of Meteorology and the Tasmanian Fire Service. Since the conference, I have followed up with many of these connections to develop ideas for my PhD project as well as for new projects.

Prior to the conference, I was also invited to submit an article to *Wildfire Magazine*, published by IAWF. Within this article (<http://wildfiremagazine.org/article/fire-modeling-in-an-uncertain-world/>), I summarised the work I was to present at the conference for a wider audience, from Australian academics to American fire fighters. The April-May 2016 issue of the magazine was circulated to IAWF members prior to the conference as well as being included in the conference packs given to attendees in both Melbourne and Portland. This article is to be re-published in the next issue of *Fire Australia*, published by the BNH CRC.

MODU2016: Dr. N Sukhorukova: 18-22 July 2016, Melbourne. Mathematical Optimization Down Under. <http://www.modu2016.org/>

I gave two talks during this conference.

1. A generalisation of de la Vallée-Poussin procedure to multivariate polynomials (July, 21, morning session).
2. Constructive proof for polynomial spline approximation (replacing a co-author who was unable to attend on this day, July, 18, morning session).

This conference was a great opportunity for me to present my findings and discuss them with prominent mathematicians. In particular, I made a good contact with Prof. Constantin Zălinescu (University "Al. I. Cuza" Iasi). Prof. Zălinescu is a one of the leading experts in the area of convex analysis. Convex analysis techniques have proved to be very efficient for solving a wide range of Chebyshev approximation problems, including polynomial splines and therefore Prof. Zălinescu's feedback is especially valuable.

Prof. Zălinescu also opened for me a rich field of applications for convex analysis to the area of Statistical Mechanics. Initially, I did not plan to discuss this area with him, but it appeared after his presentation and I would like to investigate this research direction as well.

I had a very fruitful discussion with other participants (Prof. A Eberhard, Prof. R. Burachik, Dr. R. Baier, Dr. V Roshchina and many others). These valuable discussions are essential, since they are more productive than e-mails or Skype meetings. Apart from research discussions, we also highlighted a number of strategies to make our collaboration more efficient. In particular, I learnt that I can access most their research seminars via Visinet (can be installed on a laptop). This is something I am going to use when travelling is not an option.