



2013/14

# AMSI VACATION SCHOOLS AND SCHOLARSHIPS

PARTICIPATION STRATEGY IMPLEMENTATION







# INTRODUCTION

This document provides an update on the successful implementation of the AMSI Vacation Schools and Scholarships Participation Strategy in 2013/14, it should be read in conjunction with the 2012/13 AMSI Vacation Schools and Scholarships Participation Strategy.

AMSI has set the following program objectives

## Long-term program objectives

- Male and female participants are approximately equal in number and of a high calibre.
- Significant increases in participation of high calibre persons of Aboriginal and Torres Strait Islander (ATSI) descent.
- By the year 2020 at least 20% of participants will be from low socio-economic status (SES) backgrounds.

## Short-term program objectives

- Male and female participants
- Participants of Aboriginal and Torres Strait Islander descent
- Participants from low socio-economic status backgrounds should reflect the current cohort of enrolled mathematical sciences undergraduate and postgraduate students.

In the 2013/14 period attendance at the vacation schools and scholarship events increased by 25% overall, female participation increased at all events and the AMSI Schools program expanded significantly, through it's work inspiring more females, ATSI and low SES students to continue with the study of mathematics and statistics.

# PARTICIPATION



## DIVERSITY POLICY

An AMSI Research and Higher Education Diversity Policy has been developed and implemented. The policy formally outlines the methods used to actively seek cohort representation at AMSI events and supports the implementation of the Vacation Schools and Scholarships Participation Strategy.

## ENCOURGING PARTICIPATION

At the February 2013 AMSI Members Meeting the following items were tabled:

- Female participation in the mathematical sciences in comparison to participation in other disciplines
- ATSI participation in the mathematical sciences in comparison to participation in other disciplines
- Low SES participation in the mathematical sciences in comparison to participation in other disciplines

An extensive discussion took place among members about pathways, possible barriers to participation and measures at the members home institutions to increase participation of these groups.

### Outcomes

AMSI is working with our members to identify and remove any possible barriers to participation in the AMSI Vacation Schools and Scholarships programs and highlight AMSI opportunities to

- Female mathematical sciences students
- Low SES mathematical sciences students
- ATSI mathematical sciences students

AMSI Members are

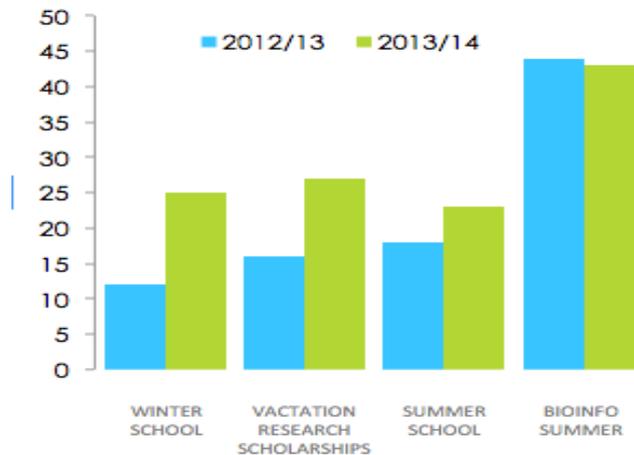
- Exploring female participation programs at their home institutions and ensuring that the programs highlight the mathematical sciences
- Promoting engagement amongst staff with female participation programs at their home institutions
- Investigating ways to engage with indigenous engagement offices at their home institution to support ATSI participation in the mathematical sciences

At the meeting AMSI also encouraged member departments to get involved with regional and rural engagement programs at their home institution and work with these programs to ensure that pathways in the mathematical sciences are clearly identified.

# GENDER

## PARTICIPATION

In 2013/14 Female participation has increased across all programs.



## BUILDING ASPIRATIONS AND RAISING CAREERS AWARENESS

AMSI actively creates female role models in the mathematical sciences through:

- Interviews with female speakers at AMSI events
- Profiles and interviews with attendees at AMSI events
- Women highlighted in careers poster series
- Mathematicians in Schools flyers distributed at AMSI events and women actively encouraged to participate

## WOMEN IN MATHEMATICS EVENTS

AMSI has established an agreement with the Australian Mathematical Society Women in Mathematics Special Interest Group.

Under the agreement AMSI facilitates the embedding of a Women in Mathematics event in the vacation schools event programs. These events are open to both women and men and raise awareness of issues faced by women in the mathematical sciences and create a national support network.

We are also working with the Women in Mathematics Group to identify and remove barriers to female speaker and student participation in AMSI events.

## FUTURE PLANS

AMSI is negotiating funding for a five-year careers awareness campaign targeting female participation in the mathematical sciences. The program will expand and enhance AMSI's current activities and build the profile of the mathematically capable individual among school students, teachers, parents and in society.

# ATSI & LOW SES

## THE NEXT GENERATION

The AMSI schools program continues to grow, providing teacher professional development for clusters of regional schools in Victoria and far North Queensland to improve mathematics teaching for students and encourage students to continue with the study of the mathematical sciences.

In addition to the AMSI program, as a partner in the Regional Universities Network pilot project to overcome barriers hampering mathematics and science education in rural, regional and remote Australia funded under the Government's Australian Mathematics and Science Partnership Program (AMSP) AMSI will be providing teacher professional development to regional and rural schools within this partnership.

AMSI also seeks funding to implement an awareness campaign targeting school level students, teachers and parents. This project aims to address the needs of rural and regional mathematical teachers and students.

To significantly increase ATSI and low SES participation in the mathematical sciences a well-funded coordinated national strategy is required.



# OUTREACH: BUILDING ASPIRATIONS

AMSI outreach activities engage all students, parents and the wider community with mathematics and statistics and aim to increase participation of under represented groups in the mathematical science.

## OUTREACH EVENTS

A comprehensive program of outreach events ran throughout the 2013/14 period. The program included public lectures linked to AMSI Vacation Schools and Scholarships events to increase awareness of both the event and the role of the mathematical sciences.

Highlights included:

- Pi Day, Simon Pampana showed students the magic of the number pi on 14 March. The event was broadcast to schools by video conference from the Australian Museum (March 2013)
- The AMSI Winter School Public Lecture *Environmental Intelligence for Australia* by Dr Rob Vertessey, Director of Meteorology & CEO, Bureau of Meteorology, gave the public an insight into the essential role of mathematics at the Bureau of Meteorology (July 2013)
- Limits to Growth Panel Discussion and Q&A facilitated by Ticky Fullerton, journalist for the ABC, the panel included leading thinkers Graciela Chichilnisky, Kyoto Protocol; Ken Henry, Former Secretary of the Department of Treasury and; Jørgen Randers, co-author of Limits to Growth, the panel considered the question is economic growth forever sustainable? (December 2013)
- Eat my MATHS! Public Lecture by Simon Singh lifted the lid on how the mathematically gifted team of writers has covered everything from calculus and geometry, pi and game theory to infinitesimals and infinity in The Simpsons (January 2014)

38 outreach events took place throughout the year, the full event listing can be seen on the Mathematics of Planet Earth website: [www.mathsofplanetearth.org.au](http://www.mathsofplanetearth.org.au)

## AMSI INTERACTIVE WEBSITE

The new AMSI website is currently in development, due to launch in the second half of 2014, it will include:

- interactive pages highlighting the varied role and applications of mathematics
- a regular blog with stories highlighting the role of mathematics and statistics
- interviews with professionals and students who use and study mathematics

## MATHS AND STATS BY EMAIL

- One of the Vacation Research Scholarship projects featured in CSIRO's Mathematics and Statistics by Email. *The maths of lab-grown livers* featured the results of Thomas Brown's summer research projects.



# OUTREACH: MPE AUSTRALIA

## MATHEMATICS OF PLANET EARTH AUSTRALIA 2013

As part of the International Year of Mathematics of Planet Earth, AMSI Members and MPE partners, 44 organisations and groups in total, joined together to present a broad program of scientific and outreach events throughout 2013.

See: [www.mathsofplanetearth.org.au](http://www.mathsofplanetearth.org.au)

### Regular Blog

The Maths of Planet Earth blog highlighted mathematical sciences research in an accessible way. The blog featured contributed articles from Australian mathematicians and statisticians and AMSI Vacation Research Scholarship students wrote blog posts about their projects, giving students the opportunity to explore communicating their research to a wider audience.

Blog topics included:

- Fighting cancer with the numbers – about the growing field of bioinformatics
- The bionic eye – explaining a mathematicians role in this project
- Euler's theorem – a brief insight into algebraic topology
- Boom boxes, opera singers, blood pressure and a French revolutionary – explore the mathematical connection
- Stuck in traffic? Maths can get you on your way – how mathematics is used to improve traffic flow

332 blogs were posted throughout the year with over 60,000 visits to the website from 150 countries. The blog will continue on the new AMSI website.

### Photography competitions

Photography competitions encouraged the wider community to explore the maths and stats in a visual way. Four competitions ran throughout the year: Singling out Symmetry, Probability and Chance, Geometry and Mathematical Concepts.

Entries included:

- Peacock fractal geometry
- Spirals in Darling Harbour
- The normal distribution tree
- Climbing frame geometry

152 entries were received, all entries can be seen here: [www.mathsofplanetearth.org.au](http://www.mathsofplanetearth.org.au)



# OUTREACH: CAREERS

## CAREERS AWARENESS

### Maths Ad(d)s

Circulated to 10,000 students around Australia, the 2013 Maths Ad(d)s featured student profiles from the AMSI vacation schools and scholarships project and profiles of mathematicians and statisticians

### Posters

Where can maths take you? is a poster series developed in conjunction with The Institute for Marine and Antarctic Studies (IMAS) that shows some of the exciting career paths through the study of mathematics and statistics at the institute.

[www.mathsofplanetearth.org.au/category/maths-taking-you-places](http://www.mathsofplanetearth.org.au/category/maths-taking-you-places)

The series compliments AMSI's Maths: Make your Career Count series. [www.mathscareers.org.au](http://www.mathscareers.org.au)

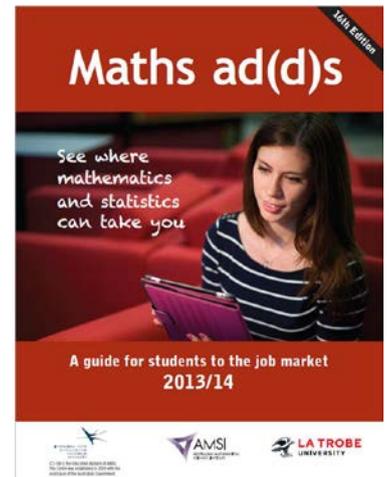
### Careers Afternoon

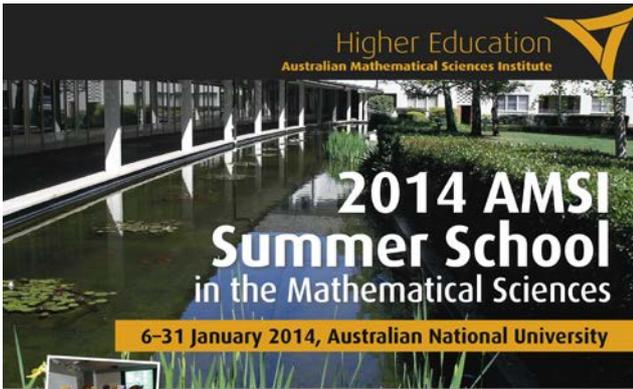
The annual Careers Afternoon embedded in the AMSI Summer School gives students the opportunity to hear from mathematical sciences employers. This year employers included the Commonwealth Bank, Geoscience Australia and CSIRO.

## DATA COLLECTION

AMSI has included additional questions to the annual member survey to ensure that gender, SES and ATSI participation figures are captured for the discipline.

The annual discipline profile report prepared by AMSI may be downloaded here: [www.amsi.org.au/publications](http://www.amsi.org.au/publications)





**7 Reasons to Attend:**

- **Learn** from Australia's leading mathematicians and statisticians
- **Choose** from a wide range of courses to suit your speciality
- **Gain** credit towards your degree
- **Meet** future employers at the Careers Afternoon
- **Build** your networks at dinners, BBQs and special events
- **Broaden** and deepen your knowledge base with advanced coursework
- **Discover** the latest subjects in your discipline

**Subjects:**

- Bioinformatics - Dr Conrad Burden
- Conformal Field Theory and String Theory - Prof. Peter Bouwknegt & Dr David Ridout
- Differential Geometry - Dr Ben Andrews & Dr Julie Clutterbuck
- Finite Element Method - Dr Bishnu Lamichhane
- High-Dimensional Data - Assoc. Prof. Inge Koch & Dr Samuel Mueller
- Hydrodynamic Stability - Prof. Sergey Suslov
- K Theory - Dr Vigleik Angetveit
- Statistical Inference - Prof. Alan Welsh and Assoc. Prof. Robert Clark



**Full travel and accommodation scholarships available!**



Apply today: [www.amsi.org.au/SS](http://www.amsi.org.au/SS)



**In your 3rd year of maths & stats?  
Find out what it's like to be a researcher**

**2013/14 AMSI Vacation Research Scholarships**

Get paid to complete a six-week summer research project under the guidance of a supervisor!

**Scholarships:**

- Australia wide
- \$450/week for six-weeks
- Present at CSIRO's Big Day In
- Fully funded travel and accommodation
- Open to intending honours and masters students



Apply today: [www.amsi.org.au/VRS](http://www.amsi.org.au/VRS)



# 2013 BioInfoSummer

University of Adelaide  
2-6 December 2013

Bioinformatics is an exciting, fast-growing area analysing and simulating the structures and processes of biological systems. Bioinfosummer introduces students, researchers and others working in related areas to the discipline.

**The program features:**

- Introduction to Biology and Bioinformatics
- Evolutionary Biology
- Systems Biology
- Next Generation Sequencing
- Coding and Algorithms for Bioinformatics

**Subjects:** Coding and Algorithms, Evolutionary Biology, Systems and Bioinformatics, Sequencing, Introduction to Biology and Bioinformatics



Register now: [www.amsi.org.au/BIS](http://www.amsi.org.au/BIS)

Mathematics of Planet Earth AUSTRALIA

# The 2013 AMSI Winter School on the Mathematics of Planet Earth

The University of Queensland  
24 June - 5 July 2013

The 8th AMSI Winter School is designed for postgraduate students and postdoctoral fellows to develop their mathematical skills and to interact with world-leading mathematical scientists. This year's event will be held in conjunction with the 2013 International Year of Mathematics of Planet Earth.

**Introductory courses**

- Numerical methods on GPU  
**Vivien Challis (UQ)**
- Large-scale inversion for geophysical exploration  
**Lutz Gross (UQ) and Louise Olsen-Kettle (UQ)**
- Dynamical systems and singular perturbations  
**Peter van Heijster (QUT)**

**Advanced courses**

- Mathematical modelling of infectious diseases  
**Geoff Mercer (ANU)**
- Regularization of inverse problems in geomathematics  
**Volker Michel (Universität Siegen)**
- Optimisation for nature conservation  
**Hugh Possingham (UQ)**

**Full travel and accommodation scholarships available**  
Register at [www.amsi.org.au/WS13.php](http://www.amsi.org.au/WS13.php)







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