AUSTRALIAN MATHEMATICAL SCIENCES INSTITUTE

PARTICIPATION STRATEGY

SECURING AUSTRALIA'S MATHEMATICAL WORKFORCE

Progress Report

Stage 4 | 2019/20

Participation Strategy

Securing Australia's Mathematical Workforce

Progress Report

Stage 4 | 2019/20

"The project aligns with the National Innovation and Science Agenda (NISA), and aims to improve outcomes for higher-education students in science, technology, engineering and mathematics (STEM). It will strengthen research training for STEM graduates in Australia and contribute to a highly-skilled mathematical workforce."

Department of Education and Training, Australian Government

13 September 2016

Source: education.gov.au/australian-mathematical-sciences-institute-project

INTRODUCTION

The Securing Australia's Mathematical Workforce (SAMW): 2016–2020 project builds on the success of the AMSI Vacation Schools and Scholarship project (2012–2016) and will continue to grow the nation's future public- and private-sector workforce with advanced skills in the mathematical sciences, while also providing opportunities for increasing participation by female and indigenous students.

The project's overarching objective is to contribute to the preparation of a world-class mathematical sciences workforce in Australia. The specific project objectives are to:

- strengthen research training and the work-readiness of advanced mathematical sciences graduates
- promote university-industry collaborations that will encourage the private sector employment of mathematical sciences graduates
- attract and improve the retention of senior undergraduate students in the mathematical sciences

In addition to the challenge to achieving overall participation growth, the project aims to progress female and Aboriginal and Torres Strait Islander (ATSI) participation in each of the project activities.

SHORT-TERM OBJECTIVES

- Female and male participants should reflect the current cohort of enrolled mathematical sciences undergraduate and postgraduate students
- Participants of Aboriginal and Torres Strait Islander descent should reflect the current cohort of enrolled mathematical sciences undergraduate and postgraduate students

LONG-TERM OBJECTIVES

- Female and male 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 descent

This project directly addresses three imperatives identified by NISA—improved STEM education, enhanced industry collaboration, and increased female and ATSI participation in the STEM workforce—providing significant and enhanced commercial return on the public investment in research training in the mathematical sciences.

This document reports on the implementation of the fourth year of the SAMW 2016–2020 project and should be read with the annual stage reports for this project's activities (AMSI Flagship Events):

- *AMSI Optimise 2019: Symposium Inspiring Industry and Research Collaboration*
- *AMSI Winter School 2019 on Computational Modelling of Heterogeneous Media*
- *AMSI BioInfoSummer 2019: A Symposium in Bioinformatics*
- *AMSI Summer School 2020 in the Mathematical Sciences*
- *AMSI Vacation Research Scholarships 2019/2020*
- *AMSI Workshop Program 2019/2020*


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PARTICIPATION

The SAMW: 2016–2020 project aims to have at least 462 domestic participants across six project activities in 2019/20, including 30 per cent female student participation and the participation of one ATSI mathematical sciences student.

Overall, 128% of the annual SAMW domestic participation target was achieved, with event targets surpassed in three out of the six project activities. All events were well-attended by domestic participants whilst AMSI VRS 2019/20 attracted its second biggest number of applicants and completions. Notably AMSI held its second flagship event in Perth – Optimise, which had many industry partners and was very well-attended for a west coast event.

FIGURE 1: Domestic participation target against actual participation in 2019/20 across the project's activities

	Target	Actual
Optimise	75	73
Winter School	35	44
BioInfoSummer	130	166
Summer School	120	88
VRS	62	60
Workshops	40	161
TOTAL	**462**	**592**

The overall participation from 2018/2019 (499 participants) has been far exceeded, with 2475 attendees participating in the project's activities. An overall increase in participation is observed, from the previous four years of the 2012–2016 project, due to the addition of AMSI Optimise from 2017 and rotating events through all major cities for national benefit.

FIGURE 2: Total participation by project activity over the past 8 years

	Optimise	Winter School	BioInfoSummer	Summer School	VRS	Workshops	TOTAL
2012/13	N/A	49	120	132	41	N/A	342
2013/14	N/A	24	188	155	57	N/A	421
2014/15	N/A	30	204	107	56	N/A	397
2015/16	N/A	39	228	127	50	N/A	444
2016/17	N/A	45	206	168	43	N/A	462
2017/18	108	70	178	168	40	N/A	564
2018/19	95	27	138	171	68	N/A	499
2019/20	**99**	**74**	**226**	**163**	**66**	**1847**	**2475**

FEMALE PARTICIPATION

The SAMW: 2016–2020 project aims to have at least 30 per cent female participation in the project activities per year, in line with female representation in the mathematical sciences student cohort. Participants are asked to self-declare their gender at the time of applying to attend.

The female participation target has been exceeded again, in the fourth year of the project, with 450 female participants from 1243 fully documented participants (36 per cent of total participation).

FIGURE 3: Percentage of female participation by project activity over the past 8 years

	Optimise	Winter School	BioInfo-Summer	Summer School	VRS	Workshops	Total
2012/13	N/A	12%	44%	24%	17%	N/A	**29%**
2013/14	N/A	25%	39%	27%	28%	N/A	**32%**
2014/15	N/A	23%	40%	15%	18%	N/A	**29%**
2015/16	N/A	8%	46%	33%	30%	N/A	**37%**
2016/17	N/A	42%	51%	31%	28%	N/A	**41%**
2017/18	29%	33%	51%	29%	28%	N/A	**36%**
2018/19	34%	11%	54%	28%	28%	N/A	**35%**
2019/20	**42%**	**32%**	**57%**	**33%**	**27%**	**30%**	**36%**

In 2019/20, 42 women attended Optimise, 24 attended Winter School, 129 attended BioInfoSummer, 54 attended Summer School, 18 received a Vacation Research Scholarship and 183 women attended workshops. There was a shortfall in female participation in the Vacation Research Scholarship program.

FIGURE 4: Total female participation target percentages against actual participation in 2019/20 across the project's activities

	Target	Actual
Optimise	30%	**42%**
Winter School	30%	**32%**
BioInfoSummer	30%	**57%**
Summer School	30%	**33%**
VRS	30%	**27%**
Workshops	30%	**30%**

AMSI is also focused on the importance of achieving a gender balance of lecturers/speakers at each activity, with female participation within the program a key discussion topic and objective in the planning of each event. At least one-third female representation was achieved at all six events in 2019/20:

- Optimise—twenty-four women out of 48 speakers (50%)
- Winter School—two women out of six lecturers (33%)
- BioInfoSummer—fifteen women out of 28 speakers (54%)

- Summer School—four women out of 12 lecturers (33%)
- VRS/AMSIConnect 2020–One woman out of three speakers (33%)
- Workshops – 71 women out of 165 speakers (43%)

CHOOSEMATHS

The BHP Foundation and AMSI formed a partnership in April 2015 to deliver the CHOOSE**MATHS** program, a $22.2 million investment aiming to promote greater interest and academic achievement of girls in mathematics, leading to an increased participation in STEM subjects and contributing to a more sustainable and competitive economy.

The program increases the impact and reach of AMSI's activities to address pipeline issues from primary school into secondary school and through to university and the workplace. Increasing awareness of the value of mathematics in careers and lifestyle, especially for women, is a program highlight.

The CHOOSE**MATHS** program has a high impact in the long term on Australian student enrolments in undergraduate, honours and PhD mathematical sciences programs, and will significantly increase participation in the AMSI Higher Education programs.

CHOOSE**MATHS** works with students, parents and teachers over five years through a program of professional development, awareness and reward to turn around community attitudes to participation in mathematics, especially for girls and young women. The program is building self-sustaining education communities where girls and young women share equally in the rewarding careers and rich life experiences that mathematics offers.

Women in STEM & Diversity in STEM Events

AMSI, host universities and the Women in Mathematics Special Interest Group (WIMSIG) of the Australian Mathematical Society (AustMS) continue to collaboratively deliver Women in Maths events within the project activity programs. Three events were held at 2019/20 AMSI Flagship events, each open to all participants. These events provide an active forum of discussion focused on highlighting the contributions of women in STEM, raising awareness about issues for women and promoting career pathways.

Winter School—Diversity in STEM Evening Networking Event

In collaboration with WIMSIG and proudly partnered by the CHOOSE**MATHS** program, a Diversity in STEM event with the theme "A Celebration in Mathematics" was held on Wednesday 3 July. The evening celebrated women's contributions to the mathematical sciences and encouraged diversity in the sector. Panel members discussed their career experiences and changes they had observed. Panel members included women from indigenous, migrant, and international backgrounds as well as different parts of the mathematics and engineering communities. In a lively Q&A, the audience shared tips on fostering diversity within the mathematical sciences. Dr Julia Collins (Women in Maths Network Coordinator) also made a presentation noting issues facing women in the mathematical sciences, career opportunities for women and the achievements of the CHOOSE**MATHS** program. Over 70 guests attended QUT's scenic X Block to participate in this lively supper. We would like to thank panel members, Grace Garden, Taylah Griffin, Dr Jennifer Pestana and Dr Qianqian Yang as well as event MC Professor Deryn Vahl Meyer.

BioInfoSummer—Diversity in STEM Lunch and CHOOSEMATHS Event

A catered networking lunch celebrating diversity in STEM was held on Tuesday 3 December at the Charles Perkins Centre, University of Sydney. AMSI Research and Higher Education Program Manager Chloe Pearse opened the session with a presentation on unconscious bias and diversity in STEM. Conference attendees were challenged to think about and discuss over lunch the importance of diversity and how they could encourage it in practice.

A separate CHOOSE**MATHS** networking session was hosted by Ms Janine Sprakel, CHOOSE**MATHS** Project Director inviting attendees to identify and discuss the issues and achievements of women working and studying in the mathematical sciences as well as a celebration of the accomplishments of the CHOOSE**MATHS** program. Specifically targeted at female students and early career researchers, this event provided the opportunity for CHOOSE**MATHS** grant recipients to network with each other and other female bioinformaticians from across the country.

Summer School—Diversity in STEM and Women in Mathematics Events

In 2020, the Diversity in STEM event was hosted as part of the Careers Day Fair activities. Designed as a panel session, the event brought together various professionals from different parts of mathematics to highlight the achievements and some of the challenges from diverse voices in the field. The panel touched on their experiences in STEM and gave the audience more of an insight into some of the challenges that hinder diversity and inclusion in academia and the workforce. Panel members included those from the LGBTQI+ and migrant communities as well as those living with disability. Attendees were encouraged to participate in lively and informative discussions around these barriers and think more broadly about the ways they can participate and create a more inclusive community. AMSI and La Trobe would like to thank Dr Sarah Stephenson (Murdoch Children's Research Institute/ founding member of QueersInScience), Stephanie Marinis (masters student, La Trobe University), Haylo Roberts (microbiologist, geneticist and science communicator) and Dr Bishnu Lamichhane (The University of Newcastle) for their time.

A separate Women in Maths network exchange was hosted in the first week of Summer School. Held over lunch, this event invited all female students to network with each other and discuss career paths and issues facing women working and studying in the mathematical sciences. We would like to thank Professor Kate Smith-Miles, Associate Professor Katherine Seaton and Dr Anja Slim for their time and expertise.

ATSI PARTICIPATION

The SAMW: 2016–2020 project aims to have at least one ATSI participant per year, in line with ATSI representation in the mathematical sciences student cohort. Participants are asked to self-declare their ATSI status at the time of applying to attend, with an option not to disclose.

The ATSI participation target was achieved in 2019/20, with one participant (.02 per cent of total participation) self-identifying as being of Aboriginal and Torres Strait Islander descent.

This follows the success in attracting ATSI participation in the Vacation Schools and Scholarships 2012-2016 project in the previous five years. However, it must be noted that the high number of students identifying as ATSI in 2014/15 and 2015/16 may have included international students who did not fully understood the question upon registration. From 2016 onward, the definition of ATSI status was clearly defined and therefore more accurate data can be assumed to have been collected.

FIGURE 5: Total participants who have identified as being of Aboriginal and Torres Strait Islander (ATSI) descent by project year over the past 8 years

	ATSI	Undisclosed
2012/13	1	43
2013/14	2	22
2014/15	12	22
2015/16	16	37
2016/17	3	2
2017/18	4	46
2018/19	2	3
2019/20	**8**	**6**

NB: Participants who elected not to disclose their ATSI status or did not answer the question are included while non-ATSI participants are not shown

GRANTS

Recognising the building of professional networks and research collaborations as vital to a successful academic career in mathematics and cognate disciplines, two types of grants were offered: AMSI Travel Grants and AMSI CHOOSE**MATHS** Grants, dedicated to providing financial support in funding expenses associated with attending AMSI Flagship Events.

AMSI Travel Grants were offered to support the travel and accommodation costs of AMSI Member university students attending AMSI Flagship Events. These grants are funded by this project, as well as the event-host universities, and were awarded on a competitive basis.

Seventy-five AMSI Travel Grants were awarded in 2019/20.

AMSI CHOOSE**MATHS** Grants support female mathematical sciences students and early-career researchers to build and extend their skills and professional networks by providing financial support towards travel, accommodation and/or caring responsibilities to assist them to attend AMSI Higher Education Flagship events. AMSI Choose Maths Grants are an initiative of the AMSI Schools CHOOSE**MATHS** Project funded by the BHP Foundation.

Forty-five AMSI CHOOSEMATHS Grants were awarded in 2019/20.

Four of these grants included financial assistance towards alternative accommodation, travel support for accompanying family members and/or caring responsibilities for young children, enabling the grant recipient to fully participate in the program.

OUTREACH & ENGAGEMENT

SCHOOLS ENGAGEMENT

Through the CHOOSE**MATHS** project, delivered by AMSI Schools, school engagement occurs across four main components:

- Schools Outreach Activity
- CHOOSE**MATHS** Awards
- Women in Maths Network
- Careers Awareness Campaign

Schools Outreach Activities

Eight AMSI Schools Outreach Officers worked with in 120 schools in 12 geographic regions across Australia to enhance teacher knowledge of and confidence in mathematics, with a special focus on the education of girls. Many of these schools are in rural and remote areas where there are significant numbers of students of ATSI descent.

Teachers working with AMSI focus on enhancing content knowledge through the development of classroom-specific materials, planning of lesson activities and linking quality online resources and upcoming events, including public lectures. Professional-development sessions are also offered to schools on a regular basis, aimed at bringing together targeted regional clusters to discuss the curriculum, develop mathematics knowledge and share successful strategies for engaging students in mathematics.

CHOOSEMATHS Awards

STUDENT AWARDS

The CHOOSE**MATHS** Student Awards encouraged students to get creative as they stepped beyond the classroom to bring their understanding of mathematics to life on film. The aim of these awards was for students to produce a video that explained a mathematical problem or demonstrated an application of mathematics using clear and precise mathematical language, in a creative and entertaining way.

Best Senior Video
Trinity Lutheran College (Queensland)
Made It

Best Intermediate Video
Danebank An Anglican School for Girls (New South Wales)
We need to start it

Best Junior Video
Rossmoyne Primary School (Western Australia)
Indiana Jones and the Maths Crusade

To view the videos please see: choosemathsawards.org.au/2019-choose-maths-award-winners/

TEACHER AWARDS

The CHOOSE**MATHS** Teacher Awards identified and acknowledged Australia's most engaging and innovative teachers. Two types of awards were up for grabs, the *Mentoring Girls in Mathematics Award*, for demonstrated outstanding achievement in inspiring and fostering the participation of girls in mathematics, and the *Teaching Excellence Awards,* for excellence in demonstrating dedication to fostering student achievement, enjoyment and potential.

Mentoring Girls in Mathematics Award

Louise Puslednik, St Matthews Catholic School (New South Wales)

Outstanding Primary Teacher

Ryan Jellie & Elizabeth Dewar, Boneo Primary School (Victoria)

Outstanding Secondary Teacher

Deb Woodard-Knight, Walford Anglican School for Girls (South Australia)

To view all the award winners please see: choosemathsawards.org.au/2019-choose-maths-award-winners/
Please note there will be no CHOOSEMATHS Awards in 2020.

Women in Maths Network

The Women in Maths Network aims to link senior high-school and undergraduate university students with women in industry and academia through a mentoring program. This network of role models was established to inspire young women to seek the opportunities mathematics offers, through:

- a community of high-achieving women
- young women connecting with women working in STEM through shadowing opportunities
- careers events at AMSI Member universities
- the Maths and Biology Initiative
- scholarships to students to attend higher education events

Please note there will be no Mentoring Network in 2020.

Careers Awareness Campaign

The Choose Maths national careers awareness campaign works with students, parents and teachers to turn around community attitude and participation in mathematics and statistics as a career choice, especially for girls and young women. As the demand for technology and innovation increases, so does the demand for STEM occupations. It is estimated that 70 per cent of the fastest-growing occupations will require STEM skills, and maths is undoubtably the tool students will need to take advantage of these jobs of the future and for those wanting to make a difference in our world.

The 2019 campaign once again expanded on previous years with an increase in advertising reach and classroom resources for schools. The print materials, which included posters and our annual careers guide, were sent nationally to secondary schools with our web presence expanding to include more downloadable content, videos and study information for teachers, parents and students. Please note a campaign will not be held in 2020.

The advertising campaign has increased to include a wider digital presence, with advertising across platforms such as Snapchat, Instagram and a range of websites that engage well with the audience. More traditional media, such as outdoor, public transport and radio advertising, have again been used for a wider reach.

AMSI communicates to diverse CHOOSE**MATHS** stakeholders via the following online resources (as of 12 June 2020):

- Facebook: @choosemaths (1040 Likes), @amsischools (425 Likes)
- Instagram: @choosemaths (355 followers)
- Twitter: @AMSIschools (1278 followers)
- CHOOSE**MATHS** Website (choosemaths.org.au)
- Calculate Teacher Resource Portal (calculate.org.au)

PUBLIC LECTURES

In 2019/20, the project activities included three public lectures, contributing significantly toward increasing public awareness of the public-lecture program, the project activity, and particularly the role of the mathematical sciences through these applied themes.

AMSI Winter School 2019 Public Lecture

Numerical Simulation in Sheet Metal Manufacturing Processes and its Impact on the Aerospace Industries

Mr Michael Elford, Dr Andrew Stefan and Dr Yunpeng Zhang, Boeing Defence Australia

This Public Lecture was held on Monday 8 July in the Kindler Theatre at the Queensland University of Technology, Science and Engineering Centre. It was presented by three members of Boeing Defence Australia: Michael Elford, Dr Andrew Stephan and Dr Yunpeng Zhang. They spoke at length on numerical simulation in sheet metal manufacturing processes and its impact on the aerospace industries. Audience members had the opportunity to see visualisations of results, methods for model validation, and get a sneak peek at the day-to-day lives of mathematicians working in this exciting field. Over 60 people attended and time was given for questions and discussion, followed by supper.

AMSI BioInfoSummer 2019 Public Lecture

The Bright Future of Applied Statistics

Professor Rafael Irizarry, Harvard University

A free evening lecture, open to the public and accessible to Year 10 students and above, was held on Thursday 5 December at the University of Sydney as part of the AMSI BioInfoSummer 2019 program. Over 150 people listened to “The Bright Future of Applied Statistics” by Professor Rafael Irizarry from Harvard University. Professor Irizarry provided several examples of how statistics and statistical modelling are being used to tackle current challenges and uncover critical insights needed to reshape our world and how we live in it, including some from his own research in genomics and estimating the effects of Hurricane María in Puerto Rico.

AMSI Summer School 2020 Public Lecture

Modelling the Climate System to Understand the Human Role in Recent Climate Change

Professor David Karoly, NESP Earth Systems and Climate Change Hub, CSIRO

Professor David Karoly from the CSIRO was the guest speaker in 2020, presenting his lecture ‘Modelling the climate system to understand the human role in recent climate change’. The event was hosted at the West Lecture Theatre I at La Trobe’s Bundoora campus. In light of the highly topical issue of climate change in Australia and around the world, this lecture was very popular, attracting approximately 150 attendees from both the Summer School and the general public. The lecture was followed by a rigorous Q&A session where audience members could delve deeper into some of the concepts covered in the presentation. This lecture was recorded and has attracted 566 views since being uploaded on the AMSI YouTube channel in February 2020.

CAREER AWARENESS

Careers Events

AMSI and the host universities continue to collaboratively deliver careers events within the project-activity programs. In 2019/20, three events were delivered and were well-attended. Although these events across the three project activities were unique in their format, each promoted career awareness to attendees and encouraged networking.

BioInfoSummer Careers Evening

A panel event to showcase career opportunities in bioinformatics and provide a forum for discussion around different career pathways was held on Tuesday night. Attendees heard about the APR.Intern program from Business Development Manager Maria Galanis. Panel facilitator Dr Rebecca Poulos from the Children's Medical Research Institute then asked each of the following panellists to share their experiences in the mathematical sciences before inviting questions from the audience:

- Dr Brett Laydon, Optiver Asia Pacific
- Dr Kitty Lo, The University of Sydney
- Associate Professor Jason Wong, University of Hong Kong
- Elena Zotenko, Garvan Institute of Medical Research

Summer School Careers Day Fair

The Careers Day Fair is always a highlight for students attending Summer School, providing valuable information and contacts for student careers pathways. This year, the event was hosted by AMSI Director Professor Tim Brown. Presentations about career pathways in mathematics were given by:

- CSIRO's Data 61
- Optiver
- Australian Signals Directorate
- Bureau of Meteorology
- APR Intern

This was followed by two different panel sessions about pathways for Graduates in the Mathematical Sciences and a Diversity in STEM panel. These panel sessions gave students the opportunity to find out more about different career paths available to them, exposure to different career experiences and a chance to engage in deeper discussion with members of industry.

Choose Your Own Adventure—Pathways for Graduates in the Mathematical Sciences

- Nicole Meaker, CISCO
- Sam Salehi, Trustwave, an Optus Company
- Michael Camarri, Cognizant
- Chloe Pearse, AMSI (Panel MC)

Diversity in STEM Panel Session

- Dr Sarah Stephenson, Murdoch Children's Research Institute/ founding member of QueersInScience
- Stephanie Marinis, La Trobe University
- Haylo Roberts, microbiologist, geneticist and science communicator
- Dr Bishnu Lamichhane—The University of Newcastle
- Chloe Pearse, AMSI (Panel MC)

The Careers Day Fair also included an expo where students were able to talk with presenters, panel speakers and stall holders individually about career paths and graduate employment opportunities. 120 students participated in the event with positive feedback from both presenters and students. Students found the day very informative, discovering career pathways they did not realise were available to them.

VRS Guest Speakers

Three guest speakers gave careers presentations, sharing their experiences and giving professional advice to the scholarship recipients at AMSIConnect (the two-day conference for Vacation Research Scholars and their supervisors):

- Michelle Strumila, The University of Melbourne: Life as a PhD Student
- Dr Julien Ugon, Deakin University: Life as a Researcher
- Professor Tim Brown, AMSI: Careers Advice interactive Q&A session

Maths Adds

Maths Adds gathers together a sample of job advertisements from recent years. The common theme of the ads is mathematics and statistics, but the actual jobs vary across a very broad spectrum—from health to computing, data analysis to biology, and meteorology to finance.

Highlighting opportunities available to students who include mathematics or statistics in their degrees—only adding to future career options—this print resource is updated annually and circulated to over 120 schools, in addition to AMSI's 31 Member Universities around Australia. 28,000 were distributed in 2019/20.

In addition to job advertisements, Maths Adds features student case-studies and profiles of mathematicians and statisticians, including participants in the SAMW 2016–2020 project.

Targeting senior secondary students and undergraduate students, this resource is prepared by AMSI and La Trobe University and is also available online at careers.amsi.org.au.

MEDIA

AMSI in the Media

AMSI has continued to achieve significant increases in the number of news articles featured in community, local and national media coverage across channels and platforms, including print newspapers and website articles, social media posts and radio interviews. This has increased the number of visits to the AMSI website and to the event sites.

AMSI's Research and Higher Education activities have featured strongly in the media in 2019/20, with 42 unique instances of coverage. This success results in a wide reach, increased awareness, and the enhanced profile of the project and the program.

A collection of news articles is featured and promoted on AMSI's website. To find out more about the coverage, reach and profile of AMSI, or to read some of the articles, please visit the website at:https://amsi.org.au/media-releases/ .

Media Coverage of Flagship Events

AMSI Summer School 2020 received coverage in 42 publications around Australia. An article published on news.com.au focused on the recent bushfire season and the impact of climate change. This article was syndicated in a further 37 news publications including *The Herald Sun, Courier Mail, The Daily Telegraph* and *The Advertiser*. A second article appeared in four Fairfax newspapers across Australia including *The Age, Sydney Morning Herald, WA Today and Brisbane Times*. This article focused on climate change in reference to the Australian Open and the intense summer temperatures. A breakdown of publications promoting the Summer School public lecture is listed below:

FIGURE 7: AMSI Summer School 2020 media coverage

	Publisher	Title	Reach
26 Jan 2020	Greenie Watch	The science behind climate change and its impact on bushfires	5209
25 Jan 2020	Fraser Coast Chronicle*	Role of climate change in recent bushfires	64550
25 Jan 2020	Tweed Daily News*	Role of climate change in recent bushfires	31491
25 Jan 2020	Gladstone Observer*	Role of climate change in recent bushfires	88695
25 Jan 2020	Chinchilla News*	Role of climate change in recent bushfires	19937
25 Jan 2020	The Morning Bulletin*	Role of climate change in recent bushfires	141407
25 Jan 2020	News Mail*	Role of climate change in recent bushfires	156885

25 Jan 2020	The Queensland Times*	Role of climate change in recent bushfires	175769
25 Jan 2020	Sunshine Coast Daily*	Role of climate change in recent bushfires	291494
25 Jan 2020	Charleville Western Times*	Role of climate change in recent bushfires	1346
25 Jan 2020	The Chronicle*	Role of climate change in recent bushfires	184563
25 Jan 2020	The Coffs Coast Advocate*	Role of climate change in recent bushfires	91947
25 Jan 2020	Byron Shire News*	Role of climate change in recent bushfires	7564
25 Jan 2020	Ballina Shire Advocate*	Role of climate change in recent bushfires	2746
25 Jan 2020	The Daily Mercury*	Role of climate change in recent bushfires	50241
25 Jan 2020	The Daily Examiner*	Role of climate change in recent bushfires	60164
25 Jan 2020	Surat Basin Online*	Role of climate change in recent bushfires	1471
25 Jan 2020	Central Queensland News*	Role of climate change in recent bushfires	49426
25 Jan 2020	Northern Star*	Role of climate change in recent bushfires	214186
25 Jan 2020	Coolum & North Shore News*	Role of climate change in recent bushfires	2045
25 Jan 2020	Lismore Echo*	Role of climate change in recent bushfires	6693
25 Jan 2020	South Burnett Times*	Role of climate change in recent bushfires	14969
25 Jan 2020	Stanthorpe Boarder Post*	Role of climate change in recent bushfires	22450
25 Jan 2020	The Gimpie Times*	Role of climate change in recent bushfires	21563
25 Jan 2020	The Ipswich Advertiser*	Role of climate change in recent bushfires	7428
25 Jan 2020	Central Telegraph*	Role of climate change in recent bushfires	35358

25 Jan 2020	Balonne Beacon*	Role of climate change in recent bushfires	6919
25 Jan 2020	Dalby Herald*	Role of climate change in recent bushfires	6159
25 Jan 2020	Gatton Star*	Role of climate change in recent bushfires	62243
25 Jan 2020	Central & North Burnett Times*	Role of climate change in recent bushfires	2485
25 Jan 2020	Whitsunday Times*	Role of climate change in recent bushfires	40997
25 Jan 2020	Warwick Daily News*	Role of climate change in recent bushfires	48361
25 Jan 2020	News.com.au*	Role of climate change in recent bushfires	15774911
25 Jan 2020	The Advertiser*	Role of climate change in recent bushfires	1437804
25 Jan 2020	The Daily Telegraph*	Role of climate change in recent bushfires	3209328
25 Jan 2020	The Courier Mail*	Role of climate change in recent bushfires	1947807
25 Jan 2020	Herald Sun*	Role of climate change in recent bushfires	2723145
25 Jan 2020	The Western Star*	Role of climate change in recent bushfires	8538
19 Jan 2020	The Age*	'They have to adapt': top scientist says Australian Open should consider moving	3637397
19 Jan 2020	WA Today*	'They have to adapt': top scientist says Australian Open should consider moving	465851
19 Jan 2020	The Brisbane Times*	'They have to adapt': top scientist says Australian Open should consider moving	819482
19 Jan 2020	The Sydney Morning Herald*	'They have to adapt': top scientist says Australian Open should consider moving	8208893

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Website

The AMSI website is the primary channel of communication regarding AMSI events. The following website hits were recorded for AMSI Optimise and AMSI Winter School from 1 April 2019 to 31 March 2020. The following hits were recorded for AMSI summer events from 1 July 2019 to 30 June 2020.

FIGURE 8: Flagship Event website hits from 2019 to 2020

Website	Hits
Optimise	6575
Winter School	24 900
BioInfoSummer	11 870
Summer School	18,651
Vacation Research Scholarships	20,319

e-News

AMSI's monthly Research and Higher Education electronic newsletter consistently achieves healthy open rates (averaging 27 per cent) and click rates, as made evident throughout the past 12 months.

AMSI promotes its programs and events to direct segments and targeted audiences via this channel, increasing engagement with the wider mathematical sciences audience, and promoting the SAMW project and activities. The format includes promotion of upcoming events and other opportunities, recaps of past events, and links to quirky maths problems and fascinating stories worth sharing.

FIGURE 9: Research & Higher Education e-News subscriber numbers and unique open- and click-rate statistics from June 2019 to June 2020

	Number of Subscribers	Open Rate (%)	Click Rate (%)
Jun-19	4298	26	3
Jul-19	1550	45	10
Aug-19	4260	24	3
Sep-19	4194	24	2
Oct-19	4196	2	4
Nov-19	4177	26	4
Dec-19	4156	25	4
Apr-20	4098	25	6
Jun-20	4072	24	4

NB: Statistics exclude January, February, March and May 2020 because no e-News was sent during those months

Social Media

Social media is an important marketing tool for bringing greater awareness to the mathematical sciences and is an effective platform for promoting AMSI and its initiatives, including the SAMW project activities. AMSI's social media following continues to expand through a reach to both Australian and international audiences. The AMSI Research and Higher Education program has a strong presence on Facebook (facebook.com/DiscoverAMSI) and Twitter (twitter.com/DiscoverAMSI).

Facebook groups and events contribute to increased engagement and provide a networking channel for students participating in AMSI's Research and Higher Education events, fostering a collaborative and social environment.

Twitter is an effective way to connect with audiences unable to attend AMSI events, spreading the message across the globe and maximising the virtual reach of programs.

Promoting Flagship events such as AMSI BioInfoSummer 2019 and AMSI Summer School 2020 has been an excellent way of showcasing news and connecting with our many Facebook readers. Posts promoting these events have reached over 65,000 people on Facebook.

FIGURE 10: @DiscoverAMSI Facebook page 'likes' from 1 June 2019 to 30 June 2020

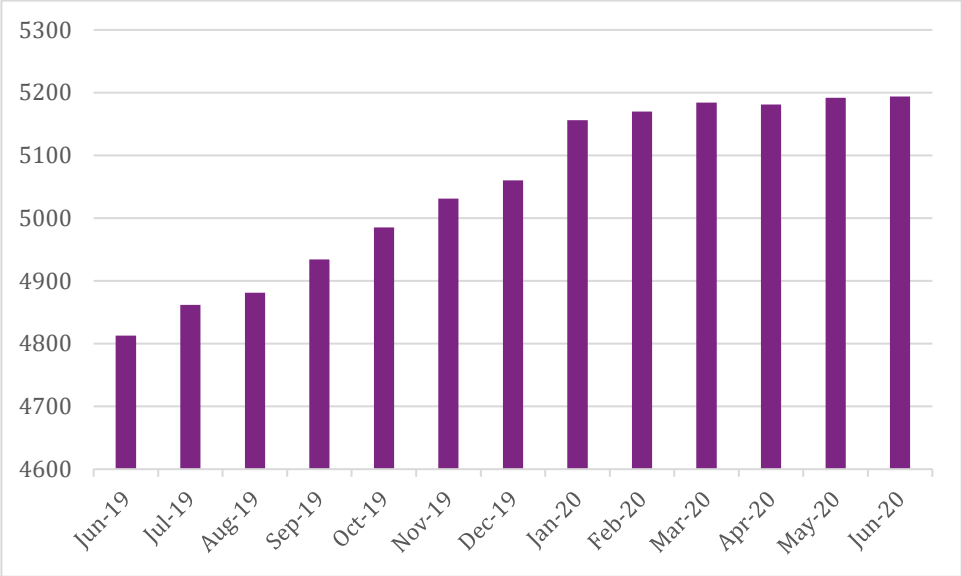
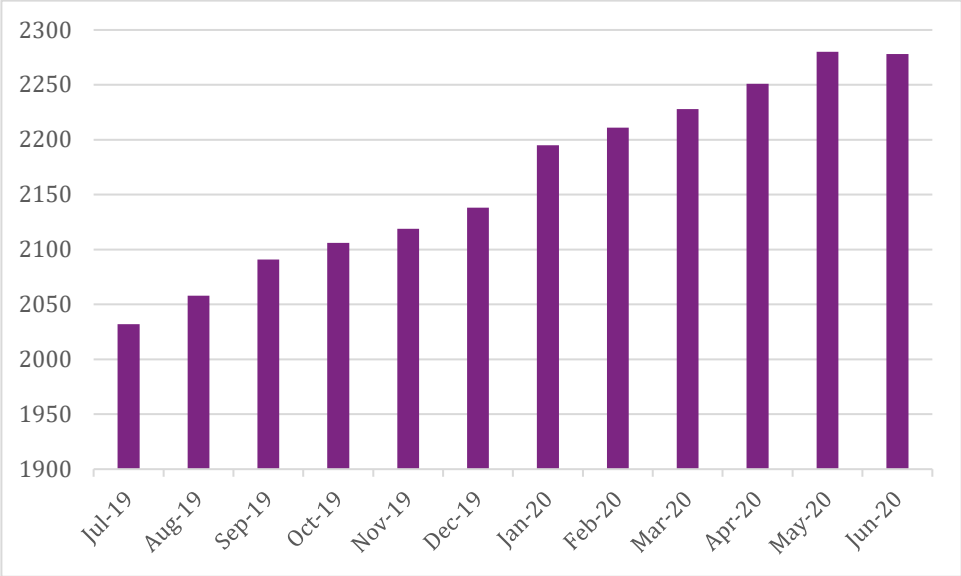
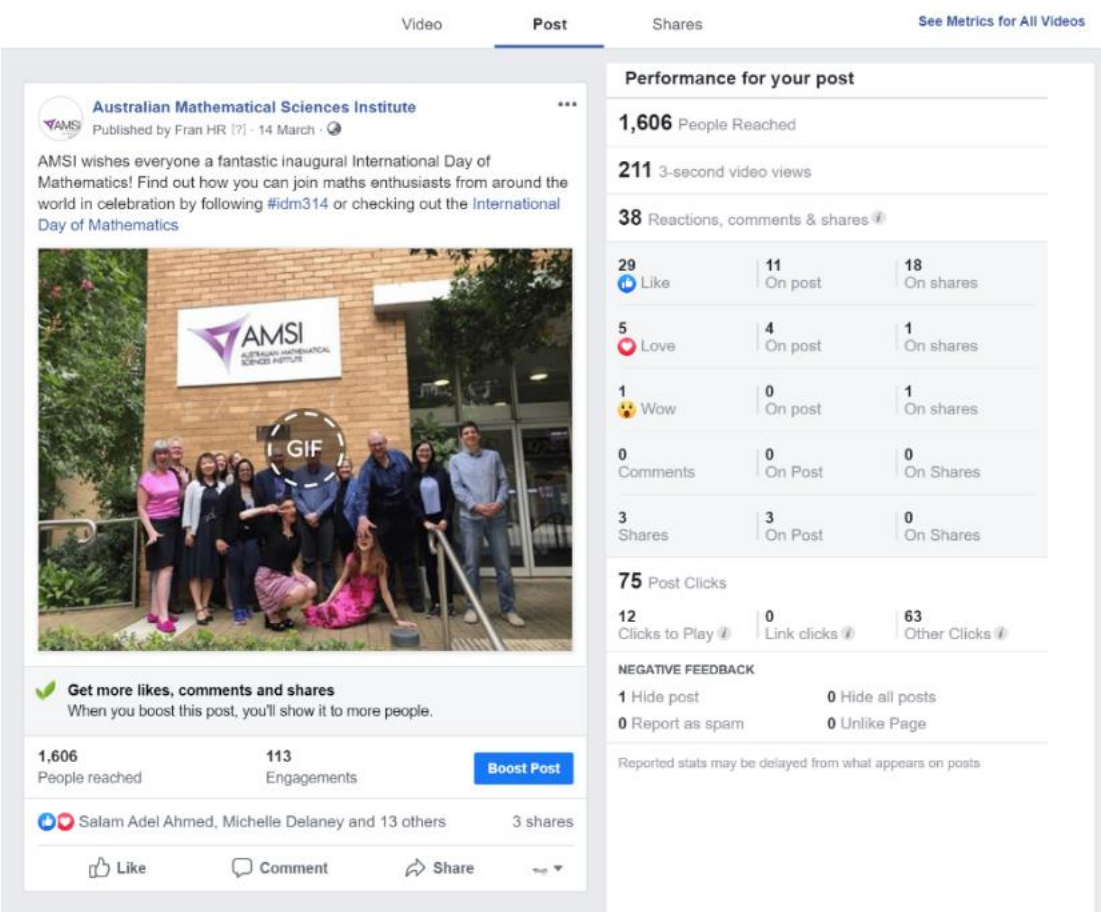


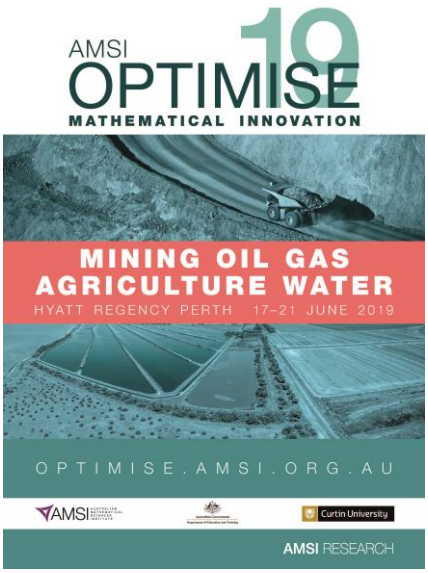
FIGURE 11: @DiscoverAMSI Twitter page 'followers' from 1 June 2019 to 30 June 2020



NB: All statistics exclude July 2020 figures as report due date is 15 August 2020

Details and performance of a March 2020 post on the Discover AMSI Facebook page




AMSI
OPTIMISE 19
MATHEMATICAL INNOVATION
MINING OIL GAS
AGRICULTURE WATER
HYATT REGENCY PERTH 17–21 JUNE 2019
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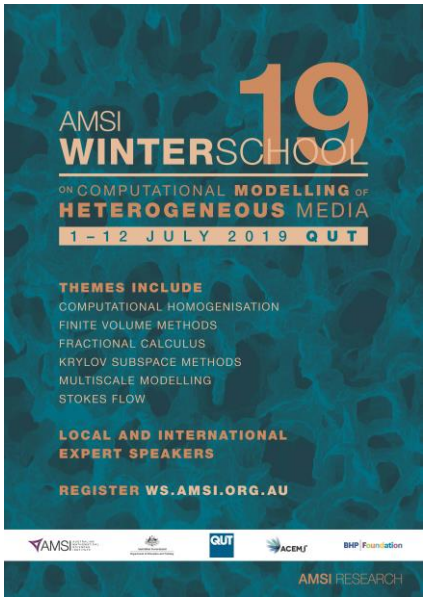
Curtin University
AMSI RESEARCH


AMSI
WINTERSCHOOL 19
ON COMPUTATIONAL MODELLING OF
HETEROGENEOUS MEDIA
1–12 JULY 2019 QUT
THEMES INCLUDE
COMPUTATIONAL HOMOGENISATION
FINITE VOLUME METHODS
FRACTIONAL CALCULUS
KRYLOV SUBSPACE METHODS
MULTISCALE MODELLING
STOKES FLOW
LOCAL AND INTERNATIONAL
EXPERT SPEAKERS
REGISTER WS.AMSI.ORG.AU
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AMSI 19
BIOINFO
SUMMER
A SYMPOSIUM IN
BIOINFORMATICS
CHARLES PERKINS CENTRE
THE UNIVERSITY OF SYDNEY
2–6 DECEMBER
THEMES
INTRODUCTION TO BIOINFORMATICS
EPIGENETICS / GENOMICS
SINGLE CELL OMICS
MASS SPEC ANALYTICS
BIOCASIA / PRECISION MEDICINE
REGISTER BIS.AMSI.ORG.AU
THE UNIVERSITY OF SYDNEY


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GEOMETRIC GROUP THEORY
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DYNAMIC PROCESSES SPREADING ON NETWORKS
EFFECTIVE TEACHING, EFFECTIVE LEARNING IN QUANTITATIVE DISCIPLINES
THE FINITE ELEMENT METHOD
RANDOM FIELDS: MATHEMATICAL THEORY AND SPATIAL STATISTICS APPLICATIONS
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SUMMER SCHOOL
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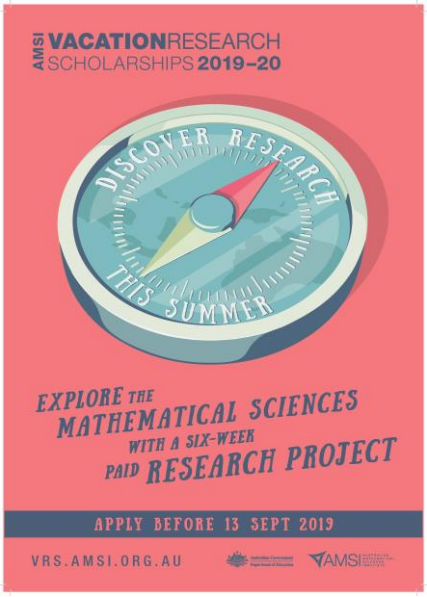
AMSI VACATIONRESEARCH
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DISCOVER RESEARCH
THIS SUMMER
EXPLORE THE
MATHEMATICAL SCIENCES
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PAID RESEARCH PROJECT
APPLY BEFORE 13 SEPT 2019
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2019 SCIENTIFIC EVENTS
6 - 8 SEP DYNAMICAL SYSTEMS APPLICATIONS TO PHYSIOLOGY DEAKIN UNI
9 - 13 SEP CHALLENGES IN HPC ANU
30 SEP - 4 OCT ANALYSIS ON MANIFOLDS ADELAIDE UNI
7 - 11 OCT APPLIED MULTIVARIATE STATISTICS METHODS WORKSHOP UON
11 OCT OPTIMISATION METHODS IN WILDFIRE EMERGENCY MANAGEMENT RMIT
20 OCT STOCHASTIC & ALGEBRAIC MODELS FOR GENOME EVOLUTION UTAS
25-29 OCT UNCERTAINTY QUANTIFICATION WORKSHOP ANU
2 - 6 DEC AMSI BIOINFO SUMMER 19 A SYMPOSIUM IN BIOINFORMATICS USYD
8 - 12 DEC DATA SCIENCE DOWN UNDER WORKSHOP UON
16 - 17 DEC FINITE GEOMETRY: A WORKSHOP IN HONOUR OF TIM PENTTILA ADELAIDE UNI
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