

**UNCONFIRMED****Australian Council of Heads of Mathematical Sciences****Meeting 1/2021****MINUTES**

The annual meeting of the Australian Council of Heads of Mathematical Sciences (ACHMS) was held at 10:30am Tuesday 16 February 2021 by video conference. The meeting was adjourned from 12:30-1:00pm for lunch.

**PRESENT****ACHMS Executive Committee**

Professor Anthony Dooley (Chair), Associate Professor Linda Galligan and Associate Professor David Yost.

**University Representatives**

Associate Professor Amie Albrecht, Professor Andrew Bassom, Professor Howard Bondell, Professor Adelle Coster, Mrs Maree Crepinsek, Professor Silvestru Sever Dragomir (for items 1-6), Associate Professor Vladimir Ejov, Dr Michael Evans (for items 3-11), Associate Professor Federico Frascoli (for items 4-7), Associate Professor Volker Gebhardt, Dr Tim Gould, Professor Joseph Grotowski, Professor Graeme Hocking, Dr Deborah Jackson, Professor Inge Koch, Professor Finnur Larusson (for items 1-10.3), Dr Christopher Lenard, Associate Professor James McCoy, Emeritus Professor Brendan McKay, Dr Anthony Morphett (for items 4-6), Professor Samuel Muller, Dr David Ompong (for items 1-6), Professor Asha Rao, Associate Professor Jorgen Rasmussen (for items 8-11), Dr Steven Richardson, Professor Stephen Roberts, Professor Tony Roberts, Associate Professor Leanne Rylands (for items 4-6), Professor Gerd Schmalz, Mr Donald Shearman (for items 4-6), Professor Aidan Sims, Professor Scott Sisson (for items 1-6), Professor Warwick Tucker, Professor David Wood (for items 1-6) and Associate Professor Zhou Zhang.

**Societies, Agencies, Groups, Observers and Non-Member Invited Speakers**

Mr Allan Dougan, Professor Tim Marchant, Dr Simon Dunstall (for items 4-11), Professor Catherine Greenhill, Dr Poh Wah Hillock (for items 4-6), Associate Professor Jessica Kasza, Associate Professor Deborah King (for items 1-6), Dr Judy-Anne Osborn, Professor Chris Tisdell, Professor Alan Welsh, Ms Misha Schubert (for items 7-11), Mr Michael Stothers (for items 8-11) and Professor Ole Warnaar.

**Others Attending**

Ms Angela Coughlin, Ms Anna Muscara (for items 4-11), Ms Karen Roe (Secretary) and Ms Maaiké Wienk (for items 4-11).

## BUSINESS

### 1. Welcome and Apologies

The Chair welcomed those present at the meeting.

#### 1.1 Apologies

Apologies were received from Dr Simon Barry, Dr Jim Denier, Professor Troy Farrell, Mr Nathan Ford, Professor Andrew Francis, Professor Thomas Lowrie, Professor Ryan Loxton, Professor Chris Matthews, Professor Thomas Nann, Professor Lyle Noakes, Professor Brian Yates and Dr Jon Whittle.

#### 1.2 Proxies and Introduction of New Representatives

The Chair welcomed the new representatives to the meeting.

#### 1.3 Minutes of the 2019 ACHMS Meeting

Minutes of the previous meeting held on Tuesday 18 February 2020 were confirmed by the ACHMS as a correct record.

#### 1.4 Action Sheet from the 2020 Meeting

The ACHMS received and noted the action list from the previous meeting and noted that all actions were completed or underway.

#### 1.5 Matters Arising

Nil.

#### 1.6 Election of Positions to be Filled (2 Year Responsibility)

The Chair reported verbally about vacancies on the Executive Committee following the conclusion of two year terms by the previous incumbents. He undertook to email the ACHMS members with a call for nominations in the categories of applied mathematics representative, pure mathematics representative and executive officer.

### 2. Report from the Chair

The ACHMS received a verbal report from the Chair reflecting on the past year and its impact on teaching and examining practices. The COVID-19 coronavirus pandemic triggered a switch to online teaching and assessment, and created difficulties for continuing research under pandemic restrictions. These challenging times called upon mathematics departments across Australia to be adaptable but still ensure that graduates acquire the core competencies in mathematics.

### 3. State of the Nation under COVID-19

The ACHMS received and noted a report entitled 'State of the Nation'. Feedback from the university representatives outlined the changes that had occurred at their universities since the previous meeting as follows:

- a. changes to the executive leadership,
- b. declining enrolments and shrinking departmental budgets,
- c. decreases in tutorial sizes,
- d. reviews of courses that resulted in the loss of several subjects,
- e. cancellation of mathematics majors,
- f. focus turned to service teaching for other disciplines,
- g. reduction in staff numbers and loss of colleagues through voluntary separation and (involuntary) redundancy programs,
- h. reduction in casual teaching support,
- i. changes in workload design for the remaining academic staff toward less face-to-face interaction with students, fewer assignments and online assessment.

Concerns were expressed about the:

- j. viability of the mathematics degree due to the loss of subjects;
- k. adequate staffing of invigilated examinations following the reduction in staff numbers;
- l. technological problems associated with the digital platforms used for online lectures and examinations. There were difficulties in uploading student essays and challenges in verifying the true identity of students;
- m. reliance on technology. Students must be able to recognise when a computer has miscalculated or supplied inaccurate information;
- n. challenges in maintaining academic integrity. There were incidents of late uploads after the conclusion of online examinations and subsequent increases in misconduct cases.

The Chair undertook to write a statement outlining the state of mathematics teaching across Australia, circulate it to the ACHMS members for feedback, then email the final draft to the Chair of the National Committee for the Mathematical Sciences.

### 4. Report from the Survey on Non-Invigilated Exams

The ACHMS received and noted the 'Summary Report of Survey on Examinations in Mathematical Sciences 2020/21' and 'Survey Responses Raw Data'. The survey questions covered university policy, academic integrity, student assessment, non-invigilated examinations and impact of the Job Ready Program' (JRP) of the federal government. The survey responses will be provided to the Australian Academy of Science for the mid-term review of the decadal plan for the mathematical sciences 2016-2025.

The ACHMS resolved to form a working group comprising the Chair, Deputy Chair and AMSI Director for the purpose of investigating the issues and writing a national

statement about non-invigilated examinations. The Chair invited volunteers to join the Examinations Working Group also.

## 5. Teaching Maths Online

The ACHMS received a verbal report from the Associate Dean (Undergraduate) at the University of Melbourne about the online teaching of mathematics during the pandemic. Physical attendance on campus and face-to-face interaction were often prohibited under the pandemic restrictions, so online methods were implemented instead. The ACHMS members discussed their experiences and made observations about the benefits and challenges of online teaching as follows:

Benefits:

- a. cost savings during a time of financial constraints for universities;
- b. remote participation by students from various campuses and increased interaction with their tutors;
- c. innovative solutions and advances in teaching practices. Technical features of the digital platforms were explored to facilitate interactive activities such as group collaboration in solving mathematical problems. However, not all students owned the most up-to-date laptops with features that enabled participation.

Challenges:

- d. online teaching increased the workload for academic staff. Additional steps were required to support remote learning for students such as online materials, interactive quizzes and support workshops. Mathematical problems and assignments had to be rethought to better suit the online delivery mode;
- e. universities did not provide adequate support for academic staff. The learning units of some universities were not well prepared for the switch to online delivery and some facilities such as recording studios needed updating;
- f. student attendance at online lectures and tutorials was high initially, but decreased over time. Engagement levels dropped and student responses during the online tutorials were low. Later access to the recordings was high however;
- g. student feedback indicated that online teaching was less engaging than face-to-face interaction but, at the same time, many students were grateful their learning could continue throughout the pandemic. Staff missed the interaction with students too;
- h. authentic assessment of students was difficult when done remotely. Invigilating examinations through digital platforms was challenging for staff.

## 6. Impact of the Job Ready Program on Mathematics Departments

The ACHMS received and noted the 'Summary Report of Survey on the Job Ready Program' of the federal government which focused on the employment-based skills of graduates and influenced funding levels for universities. The ACHMS discussed the impact of the JRP on universities and the approaches taken by mathematics departments. Feedback from the university representatives indicated that:

- a. government funding cuts were expected to be larger for the mathematical sciences than engineering or computer science;
- b. reduction of course fees would result in less income for mathematics departments;
- c. short courses were being pursued by some universities, but were not widespread so far.

It was agreed that mathematics plays a fundamental role in meeting the government objective to generate highly trained STEM graduates, so the contribution of mathematics departments should be recognised more widely. A suggestion was made to pursue inter-disciplinary connections with data science and computer science to strengthen the profile of mathematics as the underlying discipline in the training of STEM graduates.

## **7. Accreditation of Maths Degrees**

The ACHMS discussed the topic of accreditation of mathematics degrees. The benefits would include maintaining the quality of degrees through setting standards and preserving minimum content, supporting the survival of mathematics degrees and resourcing of the discipline at universities, raising the profile of the profession, demonstrating support for graduates and endorsing their fitness to practice. Observations and learnings could be taken from Engineers Australia, the Australian Institute of Physics and Royal Australian Chemical Institute which accredit courses; however a point of difference was noted in that mathematicians are not required to provide certification as part of their job, unlike engineers.

The ACHMS resolved to pursue the accreditation of mathematics degrees. The Vice-President (Learning and Teaching) of the Australian Mathematical Society (AustMS) undertook to investigate the matter and submit a recommendation to the next meeting.

## **8. WIMSIG**

The ACHMS received and noted the 'Women in Mathematics Special Interest Group (WIMSIG) Report for the 2021 Australian Council of Heads of Mathematical Sciences'. The WIMSIG Chair gave a verbal update on recent developments. Membership numbers have grown to encompass over 30 tertiary institutions. The annual WIMSIG conference has been postponed until 2021 due to the pandemic. A dinner or lunch for women in mathematics will be held as part of the annual AustMS and ANZIAM conferences. A poster series of women mathematicians across Australia is under development.

The ACHMS were encouraged to support the WIMSIG by:

- a. advertising WIMSIG events at their organisations;
- b. supporting WIMSIG programs and events;
- c. submitting job advertisements and items of interest to the WIMSIG newsletter;
- d. promoting a safe and welcoming culture in their workplace;
- e. being proactive in initiatives to improve gender equity.

An observation was made that job advertisements encourage diversity, but the unconscious bias of interview panels needs to be addressed. The current hiring freeze by universities has the potential to solidify the existing gender profile of mathematics departments. Publication metrics at some universities can disadvantage inadvertently the early career academics, particularly women.

## **9. Indigenous Issues in Mathematics**

The ACHMS Chair reported verbally on Indigenous issues in mathematics. Action plans for reconciliation and Indigenous development have been activated at many universities. Redefining competencies and promoting learning in culturally appropriate ways is crucial to supporting Indigenous students to succeed in higher education. It was suggested the Aboriginal and Torres Strait Islander Mathematics Alliance (ATSIMA), Institute of Mathematics and its Applications (IMA) and Australian Mathematical Society (AustMS) should assist with identifying Indigenous issues in mathematics and support universities to reach Indigenous targets.

The Chair undertook to reinvite the Chair of the Aboriginal and Torres Strait Islander Mathematics Alliance to speak at an ACHMS meeting about Indigenous issues in mathematics.

## **10. Matters for Noting**

### **10.1 Report from the National Committee for Mathematical Sciences**

The ACHMS received a verbal report from the Chair of the National Committee for Mathematical Sciences at the Australian Academy of Sciences on recent developments. A mid-term review of the implementation of the decadal plan for the mathematical sciences 2016-2025 is underway. He invited input from the mathematical sciences community.

### **10.2 Report from the Australian Mathematical Society**

The ACHMS received a verbal report from the President of the AustMS on recent developments. AustMS is facing financial challenges caused by increasing costs and decreasing income, so it is exploring the possibility of registration as a charitable organisation. It is preparing a statement to draw attention to issues in the mathematical sciences (which include the lack of diversity among mathematicians and shortage of jobs for graduates) and writing a formal procedure for addressing complaints about misconduct.

### **10.3 Report from the Australian Association of Mathematical Teachers**

The ACHMS received a verbal report from the Chief Executive Officer, Australian Association of Mathematics Teachers (AAMT) on recent developments. 2020 was a year of changes for the AAMT and this motivated a review of strategy and search for new opportunities. The premises were relocated to Canberra and there were changes in staffing. The biennial conference was postponed until 2021. A key objective for 2020 is to attract new teachers into the profession.

**10.4 Report from the Australian Mathematical Sciences Institute**

The ACHMS received a verbal report from the Director, Australian Mathematical Sciences Institute (AMSI), on recent developments. Individual meetings with AMSI members and stakeholders were held to understand the challenges for the education sector and receive input on how AMSI can offer value during these challenging times. The ACHMS members were invited to contact the AMSI Director to discuss any issues for their organisation.

**10.5 Report from the Statistical Society of Australia**

The ACHMS received the 'Statistical Society of Australia Report for ACHMS Meeting 2021-02-16'. The President of the Statistical Society of Australia (SSA) reported on recent developments. The SSA was unsuccessful in its application for charitable status. The Australian and New Zealand Statistical Conference was postponed until July 2021 when it will be delivered virtually. A letter was sent to the Vice-Chancellor conveying concerns about the reductions in staff numbers and cancellation of majors in physics, chemistry and mathematics and statistics at Murdoch University.

**11. Wrap Up and Summary Actions**

The Chair noted that next meeting of the ACHMS will be held in 2022.

The meeting concluded at 2:25pm.

Signed by the Chair: \_\_\_\_\_

and dated: \_\_\_\_\_

**DISTRIBUTION***ACHMS Executive Committee*

Professor Adrian Barnett, Statistics representative

Professor Anthony Dooley, Chair

Associate Professor Linda Galligan, Deputy Chair

Professor Tom Lowrie, Education representative

vacant, Pure Mathematics representative

vacant, Applied Mathematics representative

vacant, Executive Officer

*University Representatives*

Associate Professor Amie Albrecht, University of South Australia

Professor Andrew Bassom, University of Tasmania

Professor Howard Bondell, The University of Melbourne

Professor Adelle Coster, University of New South Wales

Mrs Maree Crepinsek, Southern Cross University

Professor Anthony Dooley, University of Technology Sydney

Professor Silvestru Sever Dragomir, Victoria University

Associate Professor Vladimir Ejov, Flinders University  
Dr Michael Evans, University of South Australia  
Associate Professor Federico Frascoli, Swinburne University of Technology  
Associate Professor Linda Galligan, University of Southern Queensland  
Associate Professor Volker Gebhardt, Western Sydney University  
Dr Tim Gould, Griffith University  
Professor Joseph Grotowski, University of Queensland  
Professor Graeme Hocking, Murdoch University and ANZIAM  
Dr Deborah Jackson, La Trobe University  
Professor Inge Koch, The University of Western Australia  
Professor Finnur Larusson, The University of Adelaide  
Dr Christopher Lenard, La Trobe University  
Associate Professor James McCoy, University of Newcastle  
Emeritus Professor Brendan McKay, Australian National University  
Dr Anthony Morphett, The University of Melbourne  
Professor Samuel Muller, University of Sydney  
Dr David Ompong, Charles Darwin University  
Professor Asha Rao, RMIT University  
Associate Professor Jorgen Rasmussen, University of Queensland  
Dr Steven Richardson, University of Western Australia  
Professor Stephen Roberts, Australian National University  
Professor Tony Roberts, Queensland University of Technology  
Associate Professor Leanne Rylands, Western Sydney University  
Professor Gerd Schmalz, University of New England  
Mr Donald Shearman, Western Sydney University  
Professor Aidan Sims, University of Wollongong  
Professor Scott Sisson, University of New South Wales and Statistical Society of Australia  
Professor Warwick Tucker, Monash University  
Professor David Wood, Monash University  
Associate Professor David Yost, Federation University Australia  
Associate Professor Zhou Zhang, The University of Sydney

*Societies, Agencies, Groups, Observers and Non-Member Invited Speakers*

Mr Allan Dougan, Chief Executive Officer, Australian Association of Mathematics Teachers  
Professor Tim Marchant, Director, Australian Mathematical Sciences Institute  
Dr Simon Dunstall, CSIRO  
Mr Nathan Ford, Australian Mathematics Trust  
Professor Catherine Greenhill, University of New South Wales and Chair, AustMS Women in Mathematics Special Interest Group  
Dr Poh Wah Hillock, University of Queensland  
Associate Professor Jessica Kasza, President, Statistical Society of Australia  
Associate Professor Deborah King, Associate Dean (Undergraduate), The University of Melbourne  
Professor Chris Matthews, Chair, Aboriginal and Torres Strait Islander Mathematics Alliance  
Dr Judy-Anne Osborn, University of Newcastle and Australian and New Zealand Association of Mathematical Physics



Professor Chris Tisdell, Vice-President (Learning and Teaching), Australian Mathematical Society

Professor Alan Welsh, Chair, National Committee for the Mathematical Sciences

Ms Misha Schubert, Chief Executive Officer, Science and Technology Australia

Mr Michael Stothers, CSIRO

Professor Ole Warnaar, President, Australian Mathematical Society

*Others Attending*

Ms Angela Coughlin, Acting Research and Higher Education Program Manager, Australian Mathematical Sciences Institute

Ms Anna Muscara, Project Coordinator, Research and Higher Education Program, Australian Mathematical Sciences Institute

Ms Karen Roe, Secretary

Ms Maaïke Wienk, AMSI Acting Chief Operating Officer / Research and Policy Officer, Australian Mathematical Sciences Institute

Written by K.Roe 4:26pm 3/3/21, amended by J. Grotowski 7/2/22, J. Osborn 08/02/2022