

15 May 2019

ARC Research Priorities Panel
Australian Research Council
ARC-NSRPRReview@arc.gov.au

Dear members of the ARC Research Priorities Panel,

[SUBMISSION TO ARC REVIEW INTO THE IMPLEMENTATION OF THE NATIONAL SCIENCE AND RESEARCH PRIORITIES UNDER THE NCGP]

The Australian Mathematical Sciences Institute (AMSI) welcomes the opportunity to make a submission to this review of the implementation of the national Science and Research Priorities.

As a lead organisation for mathematics in Australia, AMSI is well placed to make comment and provide advice pertaining to mathematical sciences research and its applications. For a general summary of AMSI's policy position on mathematical sciences research and building research infrastructure we refer to the 2017 AMSI policy document "[Improving Australia's Maths Grades](#)". The following general observations and recommendations are the result of consultation with academic research staff in the mathematical sciences, employed by AMSI's university members.

The ARC's priority has always been to broadly foster high-quality research capacity in Australia. A critical component of the role of public funding through the NCGP is to facilitate fundamental research. Research of this kind can generate truly transformative ideas and discoveries which often come out of left field. Fundamental research has played an essential role in applications that we can no longer live without, such as the internet, online banking, Wi-Fi and GPS. Such projects are common in the mathematical sciences. For example, the very commonly used RSA cryptography in bank ATMs relies on number theory that is centuries old.

Fundamental research delivers long-term benefits via a multi-stage pipeline. The final stages of the research pipeline can often be appropriately supported through private investment and partnerships with industry. The initial stages, however, tend to be high-risk for the private sector and are therefore not possible without public NCGP investment. Given the importance of enabling research across the whole pipeline, public funding of excellent research and supporting a strong scientific workforce will always be in Australia's national interest in the long term.

Given the public nature of NCGP funding, alignment of funding allocation with current national priorities is desirable and appropriate, provided it is appropriately balanced with research excellence. The evidence put forward by the ARC shows that Australian researchers across the board are engaged with impactful research. They align their research programs either with current Science and Research Priorities or with impact through longer-term research pipelines. This is a clear indication that the Australian scientific community accepts that publicly funded research should support the national interest both now and into the future. It is to be expected that there are differences in the proportions of immediate and longer-term impact between different disciplines. It is therefore appropriate to measure alignment of funding with national Science and Research Priorities at the national level and not by discipline.

While most funding is allocated in alignment with the national Science and Research Priorities, there is a significant minority of projects which fall outside their scope. It is important to recognise that these projects equally lead to growing knowledge and innovation and have the same potential for a transformative impact on society and the economy. These projects might be in areas that will underpin future research priorities. Some projects will have a fundamental, enabling or very broad scope.

In addition, there is no guarantee that the current Science and Research Priorities will remain in Australia's national interest in the future. Targeted funding alignment in certain research areas, linked to short term priorities, will inevitably lead to lost opportunities in other research areas. This will likely be to Australia's detriment in the longer term. To safeguard research capacity in future areas of importance, Australia must continue to invest in a broad-based research community. In the case of the mathematical sciences, the funding of high-quality fundamental research will ensure that Australia is best equipped for future challenges.

Consultation with its members has not provided AMSI with any evidence of concerns or difficulties with the current voluntary and widely accepted approach adopted by the ARC. AMSI therefore recommends maintaining the status quo.

Yours sincerely,

A handwritten signature in black ink that reads "Timothy Brown". The signature is written in a cursive style with a large initial 'T'.

Professor Tim Brown
AMSI Director