



Australia's Academic and Research Network

29 January 2010

The Secretary
House of Representatives Standing Committee on Industry, Science and Innovation
e-mail: isi.reps@aph.gov.au

Re: Inquiry into Australia's International Research Collaborations

Dear Sir/Madam

AARNet thanks the Committee for the opportunity to make a brief submission to the above Inquiry. Our main purpose in making this submission is to draw the Committee's attention to the importance of certain infrastructure, vital to establishing and maintaining many international research collaborations.

As you will no doubt be aware, there has been considerable activity within Australia's Higher Education and Research sectors over the past few years, in pursuit of the National Collaborative Research Infrastructure Strategy (NCRIS), and in particular its Platforms for Collaboration, to ensure that the necessary infrastructures are put in place to support Australia's research agenda (see <https://www.pfc.org.au/bin/view/Main>).

We are sure you will also be well aware of the existence of AARNet, Australia's National Research and Education Network, which celebrated its 20th anniversary in 2009 – AARNet was responsible for bringing the Internet to Australia (see Glenda Korporaal, "AARNet: 20 Years of the Internet in Australia: 1989-2009", AARNet Pty Ltd, 2009). AARNet is focused on providing a world-class high-speed network infrastructure to support Australia's higher education and research community, which is driving the evolution of high speed broadband networks and applications which will foreshadow the development of Australia's National Broadband Network.

Within AARNet, we have been fully supportive of the above research infrastructure initiatives. AARNet is owned, funded and operated by 38 Australian universities and the CSIRO, and has made substantial investments of its own to support the creation and maintenance of its network. AARNet is a fully owned entity of the Higher Education and Research Community in Australia and has built and acquired its own optical fibre backbone right across Australia, together with high-speed links across the Pacific. These now operate at between 10 and 40 Gbps, and are capable

of increasing substantially in line with demand. They connect every university and CSIRO and many other research organisations to each other and to the international research community. In addition, AARNet connect hundreds of Schools, TAFES, Medical Research and Cultural Institutions across Australia to each other and the rest of the world.

In setting out the above, we wish to underscore how vital such e-infrastructure is to successful research collaborations, especially to international research engagement, and it enables Australian researchers to compete and collaborate on equal terms with their international counterparts (ToR 4).

The nature and extent of existing international research collaborations (ToR 1) employing this e-infrastructure is exemplified by the following illustrative international collaborative initiatives:

- High-Energy Physics: huge amounts of data from CERN's Large Hadron Collider (LHC) are fed to scientists around the world via multiple 10Gbps links, and are carried by AARNet to the Australian (Tier 2) distribution point at Melbourne University, where AARNet has worked closely with Professor Geoffrey Taylor and his team to ensure that there are no bottlenecks in feeding this data stream to Melbourne University, and thence to other researchers within Australia.
 - Radio Astronomy: synchronising the data that radio telescopes collect in real-time from remote astronomical sources by connecting them over high-speed fibre links enables very substantial improvements in image resolution (this is termed electronic very long-base interferometry, eVLBI); Australian astronomers have collaborated successfully on many occasions with their colleagues in Europe, Japan and China and elsewhere by incorporating Australian radio telescopes into such "live" international hook-ups; this is the principle being employed by the Square Kilometre Array (SKA) and the Australian SKA Pathfinder radio-telescope arrays – AARNet has been working very closely with CSIRO and other Australian radio-astronomers to ensure that Australia is well-served by its network connections to support its bid to host the SKA; this is one of the benefits to Australia from engaging in international research collaborations (ToR 2).
AARNet would also like to draw the attention of the Committee to international recognition of the importance to research collaboration of adequate e-infrastructure, and various international efforts to put it in place. These include the European Union's e-Infrastructure Strategy and USA's National Science Foundation's Cyberinfrastructure strategy:
 - EU's e-Infrastructure Reflection Group's Roadmap, December 2009 – see http://www.e-irg.eu/index.php?option=com_content&task=view&id=39&Itemid=38
 - EU's Conclusions on the future of information and communication technologies research, innovation and infrastructures 3-Dec-09 – see www.consilium.europa.eu/uedocs/NewsWord/en/intm/111719.doc
 - USA's National Science Foundation's Office of Cyberinfrastructure Vision for 21st Century Discovery, March 2007 – see <http://www.nsf.gov/pubs/2007/nsf0728/index.jsp?org=OCI>
- In addition, there have been at least two international Reports which underscore the strategic importance of National Research & Education Networks:
- The Case for National Research and Education Networks (NRENs), Terena, January 2009 – see <http://www.terena.org/publications/files/20090127-case-for-nrens.pdf>.
 - KAREN Economic Value Report, REANNZ, February 2009 – see <http://www.karen.net.nz/assets/Uploads/Publications/REANNZ-Economic-Value-Report->

[Full.pdf.](#)

All these Reports and Strategies both underscore the vital role played by such infrastructures (especially networking and applications) in providing practical measures for addressing impediments to initiating and participating in international research collaborations (ToR 4), and also nicely illustrate various principles and strategies for supporting international research engagement (ToR 5). For Australian researchers, separated by large distances from the centre of much international research activity (eg USA and Europe), the importance of adequate international network connections cannot be overemphasized.

AARNet recommends that the Committee recognizes the role of the differentiated needs of high end networking for Research and Education and its support for international research collaborations, and reinforces the role of AARNet in its efforts to maintain world-class national and international network connections for researchers and educators in Australia.

Yours faithfully

A handwritten signature in black ink, appearing to read 'C Hancock', written in a cursive style.

C Hancock
Chief Executive Officer

Appendix 1: Terms of Reference of the Inquiry into Australia's International Research Collaborations:

The House of Representatives Standing Committee on Industry, Science and Innovation shall inquire into and report on Australia's international research engagement, with particular reference to:

1. The nature and extent of existing international research collaborations.
2. The benefits to Australia from engaging in international research collaborations.
3. The key drivers of international research collaboration at the government institutional and researcher levels.
4. The impediments faced by Australian researchers when initiating and participating in international research collaborations and practical measures for addressing these.
5. Principles and strategies for supporting international research engagement.