President's column

Nalini Joshi*

Three months have passed since I wrote my last column for the *Gazette*. In this usually peaceful part of the year, so many events of interest have occurred that I am finding it difficult to fit them all into this report.

Two of these are face-to-face conversations with key people in authority in Australia, an activity which I find extremely important. By saying this, I do not mean to imply that written reports are unnecessary. Reports provide evidence, usually backed up by expert researchers, reference groups or reviewers. They crystallise facts and propose change. But information comes in many forms and communication works in many ways. If you are involved in teaching or training, you would already know that the best kind of communication conveys a passion for your subject, enables an exchange of ideas and tantalises the listener or reader with a dream of great things. Conversations back up reports by conveying passion, ideas and dreams in a very immediate way.

On 16 October 2009, I had a meeting with the Chief Scientist for Australia, Professor Penny Sackett. My meeting with Penny ranged widely over many issues of importance to mathematical sciences in Australia, including primary and secondary education and research funding for mathematical sciences. On 27 January 2010, I had a meeting with the Chief Executive Officer of the ARC, Professor Margaret Sheil[1]. My conversation with Margaret ranged over the ERA and research funding for the mathematical sciences.

To each, I highlighted two pages of a DEST report called 'Australian Science and Innovation System, A Statistical Snapshot 2006'[2] . These two pages show Australian scientific publications as a percentage of world totals by field of research, 2001–2005 (p. 215) and the impact of Australian scientific publications relative to the world by field of research 2001–2005 (p. 216). Let me refer to these plots by the abbreviations 'totals' and 'impact' respectively. On the impact plot, mathematical sciences is ranked third (below Geosciences and Space Science), while it is twentieth or fifth last (above Materials Science, Chemistry, Physics and Law) on the totals plot. In other words, we produce less output relative to mathematical scientists in other countries but the impact of our publications on the global mathematical scene is much higher. We punch well above our weight.

My message was that, while universities and other bodies have been discounting the quality of mathematical work by valuing numbers of publications, numbers of

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[1]For part of our meeting, we were joined by Andrew Calder from the ERA team at the ARC.
[2]See pages 215 and 216 of http://www.dest.gov.au/NR/rdonlyres/C4822084-87B6-46C2-947B-B55A70FB60A4/17649/AustraliasScienceandInnovationSystemAStatisticalSn.pdf.

PhD completions, and dollars of grant money as the currency of success, we have been quietly producing work within our discipline that is internationally regarded as very high value. Wouldn't it be nice if the ERA rankings reflected this high value?

On the ERA front, there have been three developments of interest to mathematical sciences. First, on 2 November 2009, our Society recommended a ranked list of journals in the mathematical sciences to the ARC, as it was contracted to do. We are told that the final list, incorporating feedback from overlapping disciplines, will be released in February.

Second, we have been told that papers with at least 80% mathematical content that appear in journals classified under other Field of Research codes can be 'clawed back' to the mathematical sciences codes, if the authors of these papers make a case to the ERA submissions group at their individual University. Note that the pathway for making such a case is a local arrangement that may vary from institution to institution. You should be making contact with your University's Research Office to find out how to make this case if any of your output (i.e. refereed papers, book chapters and research monographs) is assigned to FoR codes that lie outside the 01* codes for mathematical sciences.

This mechanism is expected to increase the number of outputs that are captured in each University's submission for mathematical sciences, particularly in the FoR codes 0102, 0103, 0104 and 0105. However, it is not expected to add substantially to the submissions for the pure mathematics FoR code 0101. This led to the third development in the ERA of interest to us. The ARC has determined that peer review will be used for assessing the research output in the pure mathematics FoR code 0101, but citation analysis will be used for the remaining mathematical science FoR codes, despite our submission to the ARC recommending that peer review should be used for all the 01* FoR codes. Once again, this requires action from the authors of outputs that are classified in the 0101 code. Each of you should be nominating what you believe to be the top 20% of your output to your local Research Office to be put forward for peer review.

In addition to the ERA, my continuing message has been that support for mathematical sciences is essential for maintaining a scientifically and technologically proficient, innovative society. So I was pleased to see recently that the guidelines for the next round of Future Fellowships recognise mathematical sciences as an *enabling discipline*. I quote from the guidelines:

> 4.3.3. b. Targeted discipline areas
> There are a range of disciplinary areas where national capacity needs enhancing, especially by mid-career researchers. The targeted discipline areas are enabling disciplines: mathematics; earth sciences; history; English; sociology; education; and economics.

I hope that this is the start of the turn of the tide.

Last, but not least, I joined a panel discussion by regional Heads of Mathematical Societies from Asia at the joint meeting of the Korean and American Mathematical Societies in Seoul in December 2009. There is a momentum building in the region. I expect to see some interesting action at the ICM in Hyderabad in August.

Nalini Joshi holds a PhD and MA from Princeton University in Applied Mathematics and a BSc (Hons) from the University of Sydney. She has held lecturing positions and fellowships at ANU, UNSW, and the University of Adelaide, as well as visiting positions at institutions including Princeton, Kyoto, Manchester and the Isaac Newton Institute of Mathematical Sciences at Cambridge University. In 2002, she returned to the University of Sydney to take up the Chair of Applied Mathematics and became the first female mathematician to hold a Chair there. In 2008, she was elected a Fellow of the Australian Academy of Science. Her research focuses on longstanding problems concerning the asymptotic and analytic structure of solutions to nonlinear integrable equations. She has solved open problems for the classical Painlevé equations (differential equations that are archetypical nonlinear models of modern physics) and discrete systems. Currently, she is obsessed with the analysis of cellular automata.