



# AMSI News

**Geoff Prince\***

## **Clouds on the PhD horizon**

While our decadal planners are considering formal coursework requirements for Australian PhD programs in the mathematical sciences, doubts about the value of PhDs per se are being raised in government.

Concerns about the number and employability of PhD graduates have been around for a while (just search ‘too many PhDs’). They vary from concern about the mismatch between academic and research jobs and graduate numbers, the employability outside academia of current graduates and the responsibility or otherwise of academics who are seen as using cheap labour to solve arcane problems. Little of this disquiet is based on solid evidence, mainly because we don’t have much of it! Even today the absence of data and analysis won’t stand in the way of a populist policy agenda. We need to think now about how we will answer the charge that we are training would-be academics with no long-term future in our universities.

At the end of January this year, Ron Sandland and I spent a couple of days in Canberra talking to senior public servants. Even though the new government’s policies around science and innovation are still under development, it was clear from our discussions that industry demand is a key driver right now. Government subsidy to industry is off the table. In other words, if industry wants PhDs then government may aid supply. And, with doubts around the efficacy of PhDs, lack of industry demand may mean a reduction in supply. The irony is that the Australian private sector employs few research-trained staff by international standards (see the article by Alan Pettigrew<sup>1</sup>), itself both a reflection and cause of low demand, while accepted wisdom says that research drives innovation and productivity growth.

Now I am not in favour of the university sector rolling over once again in response to the sticks and carrots of government. But I am concerned that university mathematicians, and to a lesser extent statisticians, have not faced the fact that many of their PhD graduates and postdocs pursue non-academic research careers. I do believe that we care about their academic career paths. For example, we give our PhD students tutoring experience and we foster their communication skills. We give our postdocs lecturing experience and tutor their grant-writing skills. Most importantly, we encourage their publication in the best journals and their attendance at conferences. I don’t think we do this through personal self-interest, and yet we make very little effort to prepare them for research outside the universities, their most likely destination. If we did, they would ALL be able to write and code algorithms, numeric or symbolic, and they would all be encouraged to take

---

\*Australian Mathematical Sciences Institute, Building 161, c/- The University of Melbourne, VIC 3010, Australia. Email: [director@amsi.org.au](mailto:director@amsi.org.au)

<sup>1</sup>Pettigrew, A.G. Australia’s Chief Scientist, Occasional Paper Series 1, Issue 2 (May 2012). Australia’s position in the world of science, technology & innovation. <http://www.chiefscientist.gov.au/wp-content/uploads/OPS2-OECD-for-web-FINAL.pdf>.

occasional courses in optimisation, encryption, financial mathematics or systems biology. The number of AMSI internships and enrolments in the ATN's Industrial Doctoral Training Centre would be a lot higher if we took a broader view of career preparation.

My point here is that in applying our deep concern for our students' careers more broadly we would not only help them but it would protect us from over-zealous university management cutting our HDR enrolments in response to signals from government.

At a discipline-wide level, I am pleased to say that a new initiative led by AMSI will grow and strengthen the connections between graduate education in the universities and research in our government agencies. As a direct result of the Maths of Planet Earth program last year DSTO, CSIRO, the ABS and the BoM along with 16 universities have agreed to start a network which will see agency researchers communicating directly with undergraduates, postgraduates and early career researchers. Specific outcomes are

- enhanced employment opportunities for our students
- better graduate recruitment outcomes for the agencies
- improved student retention into university maths and stats programs
- new joint research between agencies and universities in the mathematical sciences
- direct agency input into graduate programs
- greater involvement of the agencies in AMSI's workshop and flagship programs.

I hope that it will also mean greater involvement with the academic community, including the learned societies, of the many PhD graduates of ours who do and will undertake research outside of academia.

PhD training is fundamental to scholarship and we have to do all we can to maintain its currency.



I completed a BSc (Hons) and secondary Dip Ed at Monash University in the 1970s and moved to La Trobe where I undertook a PhD in 1981 in geometric mechanics and Lie groups. I did a postdoc at the Institute for Advanced Study in Dublin.

I've taught at RMIT, UNE and La Trobe University, where I was Head of Department a couple of times in the last decade. I worked at AMSI from 2004 through to 2006 in part as executive director to Garth Gaudry and I oversaw the introduction of the AMSI/ICE-EM Access Grid Room project. I became AMSI director in September 2009.

My research interests lie mainly in differential equations and differential geometry and I work with friends in Europe: Mike Crampin, Willy Sarlet, Olga Krupkova and Demeter Krupka.

My partner is a mathematician and we have two children with a refreshing lack of interest in mathematics. On the margins I brew beer and ride a bike.

I'm a proud Fellow of the Society and am currently a Council member and a steering committee member.