



# AMSI News

## Creating opportunities

As I visit member academic institutions, I find that many of them have been quite creative in designing specialist undergraduate and coursework masters programs that will equip students not only with generic skills but also with skills for niche places in the workforce. However, several undergraduate maths programs, including some long-established ones, are experiencing lower than usual enrolments. Anecdotal evidence suggests that this stems partly from a low public perception of the employment prospects of mathematical scientists. This is happening at a time when there are indications that the world demand for mathematical scientists is likely to escalate over the next few years. There is growing recognition of this impending shortfall not only in education authorities and in government scientific agencies such as CSIRO, ABS, DSTO, ANSTO, AIMS, GeoAus and ABARE, but also in mainstream government administrative departments and in private industry groups. In the mathematical science discipline, some perceive a serious phase lag between supply and demand that has been experienced before in geoscience, medicine, nursing and engineering. Workforce planning issues came to the fore at our recent Industry Forum on Mathematical Opportunities in Healthcare. I came away convinced that healthcare is yet another area that has a need for more mathematical input. I thank Tom Montague who carried the lion's share in organising a successful forum.

Around the country, I am hearing many suggestions that mathematical science departments must now work together more cooperatively to attract more students. Towards this end, on 23rd May, AMSI will be hosting a one-day "Workshop on Careers and Opportunities", organized in cooperation with the Australian Mathematical Society and ICE-EM. I hope that this will initiate a more concerted strategy.

One of the administrative departments that is becoming more interested in the mathematical sciences is the Federal Department of Agriculture, Fisheries and Forestry (DAFF). On 2nd May, the minister, the Hon Peter McGaurin MP has formally opened the new Australian Centre of Excellence for Risk Analysis (ACERA), based at the University of Melbourne but with links to all AMSI member institutions. See <http://www.maff.gov.au/releases/06/06035pm.htm>.

The ACERA Director, Prof. Mark Burgman FAA of the Dept. of Botany, is a livewire with a strong appreciation of mathematics. One of the strong selling points of the Melbourne bid for ACERA was the fact that AMSI could access a vast amount of national expertise in mathematics and statistics. DAFF recognized from the outset that it needed mathematically based biosecurity decision support tools to protect its primary industries against ecological hazards. AMSI will be investing \$100,000 per year with a guaranteed return of \$250,000 on project funding; hopefully much more in the future if we can establish our worth. These projects will progress if our universities rediscover their traditional role of working for the public good. Too many collaborative projects are stymied by university legal departments that agonize over protection of wealth-generating IP, which in practice doesn't exist outside of Fairyland, given that neither mathematical equations nor algorithms are patentable. As reported recently in the *Gazette* and in the popular newspapers, some universities' mathematics staff are facing even more downsizing to the point that the word "mathematics" no

longer will rightly appear in the title of any academic unit. We can no longer assume that university administrators, let alone the general public, will recognize the worth of mathematics. Most mathematical scientists have a primary interest in something esoteric. The stimulation of an esoteric interest is the essential driver of much of the enthusiasm in our discipline. For their own job security, many academic mathematicians have developed a strong secondary interest in something applied, such as finance, computer science, ecology, physiology, gene technology, engineering optimisation and materials science. For this purpose, the new area of risk analysis is well worth a closer look. It will involve statistics of extreme events, operations research and systems modelling. People with a background in financial modelling, statistical mechanics, non-normal distributions, stochastic simulation, ecological modelling and operations research will immediately be at home with it. The chairman of the ACERA advisory committee will be Emeritus Professor Colin Thompson FAA, whose research background is in the mathematics of statistical mechanics. I will represent AMSI on the ACERA board. New tools of risk analysis will apply not only to ecology but also to investment planning, engineering design, epidemiology, defence, geophysics and disaster response planning.

I wish to thank Associate Professor Geoff Prince, formerly our Executive Director and Interim Director who conceived of AMSI's involvement in a bid for a national centre for risk analysis. Following the completion of Geoff's term of office, I am pleased to report that he remains in close contact as the organiser of the Access Grid Network. His advice on many issues is invaluable.

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