



Math matters

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If only Math Mattered

I am sitting in the Qantas/British Airways business class lounge at Singapore Changi International Airport, in transit from Sydney to Frankfurt, on my way to the MFO [1]. For those of you for whom Math really matters I do not need to explain what MFO stands for. For all others, MFO stands for ‘Mathematisches Forschungsinstitut Oberwolfach’, a research institute for the mathematical sciences in a little German village, Oberwolfach, in the Schwarzwald (Black Forest). The main purpose of the institute is to organise specialised workshops, 51 weeks per year, bringing together mathematicians from all over the world, who are more than happy to pay for their own traveling expenses (out of their own grants, to be precise), with only local expenses paid by the MFO. No lack of enthusiasm from potential organisers either, the program has already been fixed to the end of 2007. Why do we not have something like the MFO which, by the way, is by no means unique in the world (there’s also the PIMS, MSRI, Fields Institute, to name a few) in Australia? Of course, we have AMSI [2], but despite all the good intentions, its funding and/or funding conditions, just don’t make it comparable to the MFO.

Anyway, while I am sitting in the lounge, reminiscing about the MFO, two thoughts cross my mind, with a common theme: ‘if only Math mattered’. The first one has to do with our busy lives, where due to all the other obligations that come with an academic job, very little time remains for Math. I realize that to my wife, who is usually more than sympathetic towards my mathematical needs, my justification that I have to make a trip to an idyllic institute in the

Black Forest to do Math, and in this particular case, besides listening to expert talks, try to finish a project with some Australian colleagues who are going to the same workshop, must sound like a poor excuse for taking a short vacation. It’s true nevertheless. At home, I simply don’t have a lot of time to do Math.

How wonderful is it to be in a location where, for an entire week, the only thing that really matters is Math. Surrounded by world experts in the field, by a library that ranks amongst the best Math libraries in the world, and in a location so remote that the only distraction is the (obligatory) wednesday afternoon walk to the next village to eat black forest cake. In fact, sometimes one gets the feeling that if it weren’t for the MFO, half the population of Oberwolfach would be unemployed. Here I am not just thinking of the cleaning and kitchen staff, but also for instance of the people working for the two local taxi companies, whose main source of income seems to be shuttling people back and forth from the nearest railway station to the institute. In fact, they have perfected the art of predicting on which trains the mathematicians arrive and how many, as in my (rather limited, I confess) experience there is always just enough taxis waiting. You don’t have to say where you want to go either, as for some reason that seems obvious to them.

Gone are the days that only Math mattered. These days it is just not good enough to be an excellent mathematician. You have to be a manager; manage your applications and reports, manage as many students as are willing to do projects with you. You have to be an administrator. You have to teach more and more courses. You have to

sit on 1001 committees, somehow we seem to be reviewing almost everything at any given time. You have to reach out. Many Math matters contributors have pointed out the importance of reaching out, of being accountable, of making Math more relevant to society, and I don't disagree with any of it, but ultimately for most of us there are two reasons we have chosen this profession and those are that we like Math and that we're good at it, and not because we like writing grant proposals, annual reports, etc. It is just a pity we seem to have less and less time to do what we do best, and that people who are just good mathematicians don't have a chance of survival.

To single out one particular frustration of mine, there seems to be little difference in requirements regarding application and reporting whether you apply for a \$500k or a \$10k grant, and that there is a whole unexplored spectrum of possibilities between being successful and getting \$500k, or being unsuccessful and getting nothing. Shouldn't it be easier to get \$10k? We probably all agree that we cannot properly function as a mathematician without some nominal support to attend a few conferences, invite some collaborators, buy a laptop, but that it is reasonable to require additional justification to actually employ a research associate. Now, I don't want to sound like I'm just complaining, so let me make a concrete recommendation. Why don't we lobby the ARC for a new scheme, which awards nominal research support grants, and just requires one to submit an up-to-date CV to prove one is still active? One might argue this is part of the 'university infrastructure', and that is not for the ARC to finance these basic needs, but we all know that the operating budget of most Math departments barely suffices to cover salaries.

I was about to write 'In the old days', but this might suggest I belong to an older generation of mathematicians, while the fact is that as a mathematician I am still rather young, which points to another problem

with our Math workforce that I won't be addressing in this column.

In the old days, we had ARC Small Grants, which to some extent served the purpose of providing basic needs, and had a simplified application and reporting process. But, for reasons unknown to me, that scheme disappeared. Universities were still getting the funding, some started their own small grants scheme, others used it for 'strategic initiatives' or as incentives to make people apply for larger grants, but by and large I think now the original small grants scheme has more or less fizzled out.

This brings me to the second thought I was entertaining in the lounge: the ARC. Since being asked to write a contribution for Math Matters many possible topics have crossed my mind. When I finally set down to write something (btw, thanks to the editors for their patience!) there was only one thought on my mind: ARC applications, progress and final reports. I apologize to those of you, probably most of you reading this column, who have just completed their own application(s) and report(s), and probably don't want to read anything having to do with the ARC for a while. I hope you forgive me for lingering on.

Anyway, we have all done our duty. We have published a lot, we have written a thorough proposal (intelligible to the non-expert, but still containing enough detail), or in fact as many proposals as we were eligible to put in, and now we only need to sit back and let the process take its due course, trusting that the process is fair, to paraphrase a current ARC College of Experts member [3].

I have no reason to doubt the integrity of any of the panel members, nor do I think that the process in itself is flawed (although it certainly could be improved), but the simple observation is that it is not only the Math that matters. There are a lot of considerations, of political or tactical nature, that enter each application as well. I will just mention a few, some of which are

tainted by my own experience or my background as a Mathematical Physicist. First of all, since I mentioned it already, what is Mathematical Physics? There is no such RFCD code [4], and probably rightly so, as it seems to mean different things to different people. Some would say it is a branch of Theoretical Physics, but with a more mathematically oriented approach. Some would argue it is a branch of Applied Mathematics, namely mathematics applied to physics. The Math that I am using or developing belongs to what is traditionally considered Pure Mathematics, so my personal definition might be different altogether. I guess I'm not going to attempt to give you an all inclusive definition. So, how do we choose our RFCD codes? A good place to start is to look at the composition of the "Mathematics, Information and Communication Sciences" and the "Physics, Chemistry and Geoscience" panels (which has been more difficult recently as all College of Experts members are now listed in a single list), and to determine which panel might look more favorably towards your proposal. Suppose you have decided you have more friends on the MICS panel, and you have chosen your RFCD codes accordingly. Since there are only two mathematicians on the panel, you pretty much can be assured that those will be the people assigned to your proposal. Since ultimately, due to the weighting of the different assessors, the opinion of the international experts (who, out of all assessors, are most likely to be experts in your field of expertise) counts for very little, it is probably a good idea to write a proposal, not for the experts, but in a way that those

panel members can understand and appreciate it. One might even throw in a reference to their work to please them. Of course, one should not be too obvious, so one should do some groundwork and start referring already to the panel member in the publications leading up to your proposal. [Before you accuse me of doing exactly this, let me point out I was already referring to said panel member before I knew he was going to be on the ARC panel!] Then we get to National Research Priorities. Another tactical decision to be made. We probably all agree that (all aspects of) Mathematics, if it isn't already, definitely should be a research priority, and will be tempted to tick the box of the National Research Priority area "Frontier Technologies for Building and Transforming Australian Industries: Breakthrough Science". On the other hand, many of us will probably have experienced negative comments regarding poor justification of why our mathematics falls under the National Research Priority guidelines. So, as we are being assured that whether or not our application falls within one of the National Research Priorities has no impact on the final ranking, maybe it's better to not tick the box and avoid negative comments in the assessment. I am sorry if you had hoped to get some definitive advice on this issue! Anyway, I could go on like this, but they are sounding the bell for the afternoon cakes (I have arrived at the MFO in the meantime), so I'll leave it at these few examples to illustrate that, unfortunately, it is not always only the Math that matters. But, for now, you have put in your application, there's nothing you can do about it any more, so sit back, do some Math and relax!

References

- [1] Mathematisches Forschungsinstitut Oberwolfach, <http://www.mfo.de/>
- [2] Australian Mathematical Sciences Institute, <http://www.amsi.org.au/>
- [3] I. Raeburn, *Math Matters: How others see us*, *Gazette* **32** (5) (2005) 148–150.
- [4] Research Fields, Courses and Discipline Classification codes, http://www.arc.gov.au/apply_grants/rfc_d_codes.htm

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