Editorial

Often, we mathematicians are asked that dreaded question: "What is it you actually do all day?" A few of us are perhaps brave (or is it foolish?) enough to respond with an exposition on elliptic curves, homotopy theory, pde's or Markov processes, but most of us will give a deep sigh, look sheepish, and begin to stutter "Uhhhhh ..., well ..., hmmm ..., you see ...," to finally blurt out in what seems like a super-human effort, "It is kind of complicated," hoping this will satisfy our inquisitor.

Perhaps a reasonable response would be to explain that mathematics is much like art or music, with 'beautiful theorems', 'amazing proofs' and 'stunning conjectures', but that unfortunately the wonderland of mathematics can only be fully appreciated by those initiated into the art. This may not actually answer the question about what mathematicians do, but hopefully conveys that 'doing mathematics' is a creative proces that requires passion, inspiration and an eye for beauty. After all, how different (apart from being not quite as famous) are Gauss and Euler from Mozart and Picasso?

Before you is the final *Gazette* for 2004 and the first issue with completely new artwork. Art, and how to best protect it, is also Norman Do's topic in **Mathellaneous**. His inclusion of the 'proof from the Book' of the 'Art Gallery Theorem' illustrates the view of mathematics as an aesthetic endeavour rather well.

With the end of the year drawing near, Peter Taylor has thrown down the gauntlet and challenged us in **Math Matters** to take control of the mysterious process between theory and application by adopting a rather radical new year's resolution.

We all, of course, have at one time or another resolved to prove the Riemann hypothesis or, if that were to hard, one of the other million dollar Millenium Problems. This issue of the *Gazette* launches a new series of mathematical challenges that could (or should?) have been on the Clay Institute's distinguished list, and in **The 8th problem** Alexander Molev, poses his favourite open problem.

In this last issue of the year we take the opportunity to thank our columnists, book reviewers, local correspondents and all other contributors to the *Gazette* for their efforts in 2004. In particular we would like to thank R. Baxter, R. Berghout, R. Brak, R. Buchholz, B. Clarke, G. Cohen, D. Donovan, I. Doust, D. Fitzgerald, N. Frankel, O. Foda, O. Goodman, J. Groves, P. Hall, W. Hart, M. Hirschhorn, H. Lausch, K. Matthews, P. Norbury, A. van der Poorten, W. Read, K. Seaton, E. Seneta, J. Simpson, M. Williams, N. Witte and R. Zevenbergen for their behind-the-scenes support with refereeing and translating.

We wish you all a great finale to the year and hope for your continued involvement with the *Gazette* in 2005.