

## PROFILE OF A MATHEMATICIAN: PROFESSOR IAN SLOAN

Professor Ian Sloan is one of Australia's most accomplished mathematicians. Australian born, Ian completed his schooling in Ballarat in Victoria. Ian's post secondary education includes degrees in physics and mathematics at Melbourne University, a Master's degree in mathematical physics at Adelaide, and a PhD in theoretical atomic physics at the University of London. This formal training was completed in 1964. After a decade of research on few-body collision problems in nuclear physics, and publishing some 35 papers in the physics literature, Ian's main research interests shifted to numerical analysis. Since making that change he has published some 150 papers on the numerical solution of integral equations, numerical integration and interpolation, boundary integral equations, multiple integration, continuous complexity theory and other parts of numerical analysis and approximation theory.

Ian was employed by Australia's CSR Company from 1961 to 1965, before joining the University of New South Wales as a Lecturer in 1965. After several promotions, he was appointed to a Personal Chair in Mathematics in 1983 and he has served as Head of the School of Mathematics from 1986 to 1990 and again from 1992 to 1993. He was appointed a Scientia Professor at UNSW in 1999. He has served a term as Chair of the Chemistry, Mathematics and Physics Panel of the Australian Research Council and is Immediate Past President of the Australian Mathematical Society .

In 1993 Ian was elected a Fellow of the Australian Academy of Science in recognition of his work in Mathematics. In 1997 he was further recognized by the award of the Australian and New Zealand Industrial and Applied Mathematics (ANZIAM) Society Medal, and in 2000 he was the IMA (Institute of Mathematics and its Applications UK) Distinguished Lecturer. In 2001 he was awarded the Thomas Ranken Lyle Medal of the Australian Academy of Science. The Lyle Medal is the oldest of the Academy's medals and is awarded every two years for Australian research in mathematics or physics.

Professor Ian Sloan's current research interests are in boundary integral methods, finite element methods, high dimensional numerical integration and related issues of information-based complexity, multivariate approximation theory, and the time discretisation of evolution problems. Ian describes his area of expertise, Computational Mathematics, as "that part of mathematics devoted to devising and understanding good numerical approximation schemes for the equations of engineering and science". Ian points out that "Although many people outside mathematics might not realize it, computers are nothing without an underlying scheme of mathematical computation. On the other hand, people working at the leading edge of engineering, geophysics, weather forecasting, environmental modelling, fluid dynamics, quantum physics, chemical reaction dynamics, solidification of materials and many other branches of technology are very well aware of the importance of computational mathematics. Indeed they are often themselves experts in specialized computational techniques." Potential applications of Ian's research contributions embrace fields ranging from mathematical finance to the de-

termination of the Earth's gravitational potential. He delights in the fact that the underlying mathematics touches many parts of mathematics, including analysis, group theory, approximation theory, and even number theory.

Professor Ian Sloan's contributions to mathematics go far beyond his own research accomplishments. He has played a major role in Australia and internationally in the promotion and advancement of mathematics. Some of his contributions in this regard include: Co-Chair of the New South Wales Centre for Parallel Computing, Chair of the Division of Applied Mathematics of the Australian Mathematical Society, and, Chair of the International Program Committee for the International Congress on Industrial and Applied Mathematics to be held in Sydney in July 2003. As chair of the National Committee for Mathematics he was the guiding force behind a major review of the mathematical sciences in Australia, launched by the Academy of Science in 1996. As Editor of the Journal of the Australian Mathematical Society, Series B, 25 years ago he is considered to have saved that journal from collapse. Ian is a member of the editorial boards of *IMA Journal of Numerical Analysis*, *Advances in Computational Mathematics*, *Journal of Integral Equations and Applications*, *Journal of Complexity* and *Computational Methods in Applied Mathematics* and he has completed a 6-year term as an Editor of the *SIAM Journal on Numerical Analysis*.

In addition to all of his other activities and accomplishments Professor Ian Sloan is a teacher of undergraduate students and postgraduate students and a mentor for other members of staff in mathematics at UNSW. Ian's teaching ranges across Computational Mathematics, Linear Algebra, Discrete Mathematics, Control Theory, Functional Analysis, Differential Equations, Numerical Analysis and many other subjects. He likes to involve others in his research, and proudly points out that over the years he has collaborated with more than twenty members of staff (including the new Vice-Chancellor of Sydney University) and many students.

In 2001, Professor Ian Sloan was elected as the next President of the International Council for Industrial and Applied Mathematics. This international organization for the promotion and advancement of mathematics is the umbrella society for the world's professional societies of applied mathematics.

The Citation for the Lyle Medal, awarded on 4 May 2001 by the Australian Academy of Science, reads:

**“Professor Ian Sloan:** Professor Sloan is internationally known for his work on the development and analysis of approximation methods for integral equations and differential equations, high-dimensional numerical integration, and multivariable approximation. He has developed new methods, and analysed and validated existing methods. He began his research career in theoretical physics, producing highly regarded research in few-body collision problems in atomic and nuclear physics, until changing to numerical analysis in the mid-1970s. He is Scientia Professor, School of Mathematics, University of New South Wales.”