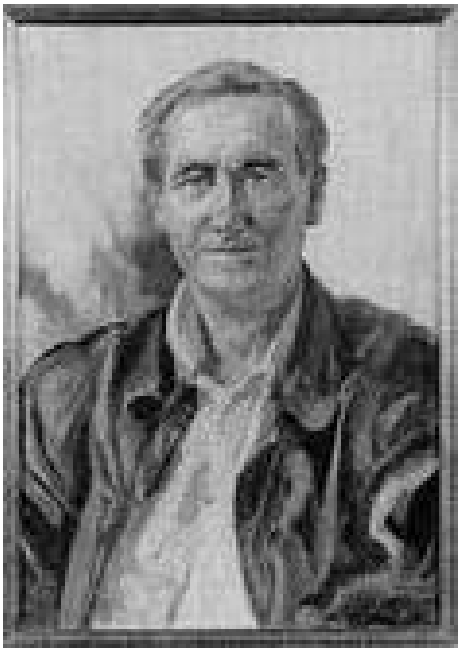
PROFESSOR EMERITUS ROY KERR GAINS NEW ZEALAND HONOUR



In the 2011 New Years Honours list our distinguished colleague was given the award of Companion of the NZ Order of Merit (CNZM) for his services to Astrophysics. This was for his work in the theory of rotating black holes, in the 1960s and later. This very high recognition results from his discovery of the exact solution of Einstein's equations for a rotating black hole. Subsequently, the Kerr solution was shown to be the only possible solution for these astrophysical phenomena. Consequently, his theoretical discovery is the basis for almost all research in astrophysics today. Indeed, the Kerr solution has been described by many as "the most important exact solution to any equation in physics".

Well-known astrophysicist Stephen Hawking, in his bestselling book A Brief History of Time, describes the uniqueness of the Kerr solution. "In 1963, Roy Kerr, a New Zealander, found a set of solutions of the equations of general relativity that described rotating black holes. These "Kerr" black holes rotate at a constant rate, their size and shape depending only on their mass and rate of rotation. If the rotation is zero, the black hole is perfectly round and the solution is identical to the Schwarzschild solution. If the rotation is non-zero, the black hole bulges outward near its equator (just as the earth or the sun bulge due to their rotation), and the faster it rotates, the more it bulges". So, to extend Israel's result to include rotating bodies, it was conjectured that any rotating body that collapsed to form a black hole would eventually settle down to a stationary state described by the Kerr solution... [Subsequent research showed] that this conjecture had to be correct: such a black hole had indeed to be the Kerr solution."

The Kerr solution, using what is now known as the Kerr metric, correctly and elegantly describes how space-time behaves in the four dimensional world about massive objects, such as steadily rotating stars or black holes. Such black holes are described by only their mass and angular momentum. This great mathematical simplicity reveals a deep and surprising simplicity in Nature regarding such important objects. Professor Andy Fabian, OBE, FRS, points out that recent research proves that large black holes "define the final mass of virtually all galaxies through a feedback action of their own output. Kerr black holes thereby play a defining role in producing the Universe we see around us." His historic paper published in Physics Letters A has been cited an amazing number of 767 times (up to 2009).

Professor Kerr was born and educated in NZ, entering immediately into year 3 at the University of Canterbury direct from school (St Andrews College), in 1951. He subsequently gained his PhD in 1959 from the University of Cambridge, and held appointments in the US before returning to NZ in 1971 as Professor of Applied Mathematics at his Alma Mater, the University of Canterbury. He became Head of the Department of Mathematics and Statistics in 1983, Today he is an Emeritus Professor at the University of Canterbury, and continues to be active in his research, both here and overseas (mostly in Italy). Expert referees involved are very much from a famous list of "Who's Who" in Astrophysics: Sir Roger Penrose of Oxford, Professor A.C. Fabian of Cambridge, and Professor Fulvio Melia of Arizona. The last of these has recently published a book entitled "Cracking the Einstein Code," in October, 2009, by the University of Chicago Press which is essentially a biography of Roy. It is highly recommended as a good read. We note he is very much at the top of this distinguished list and are glad that New Zealand (at last) has recognised the star amongst us. Your colleagues warmly congratulate him on this award.

Graeme Wake, Massey University Auckland
Graham Weir, Industrial Research Ltd, Wellington.