

AINSE Gold Medal - 1997 Dr Trevor Hicks



Dr Hicks, at left, receiving his Gold Medal from Professor Tevor Ophel, President, AINSE

Dr Trevor Hicks has won the AINSE Gold Medal for research over the past five years for his fundamental research using the only instrument attached to HIFAR, which polarises neutrons.

Dr Hicks is Reader in Physics at Monash University and has been coming to Lucas Heights for the past 28 years. He conceived and designed the neutron beamline facility on HIFAR with his physics group at Monash. 'The instrument is now in its third reincarnation,' laughed Trevor. 'Both my Melbourne-based students, completing their PhDs, and I come to HIFAR for several weeks of the year for research work in connection with our facility. This is what AINSE (the Australian Institute for Nuclear Science and Engineering) is all about,' he said.

'The instrument itself contains many parts made by my group at Monash,' he said. 'It has been largely financed by grants from the Australian Research Council and from AINSE. The facilities for attaching it to the reactor, for example the out-of-pile shielding which prevents the radiation escaping, were supplied by ANSTO together with a large amount of workshop time to manufacture other parts.

'Our instrument is also capable of analysing the polarisation after the beam has scattered from the material being investigated,' Trevor said. 'We are particularly interested in magnetism. The advantage of polarisation is that neutrons get scattered from both the magnetism and from the nuclei in the atoms in the material. We use polarisation to distinguish between the two. Without it, the two remain locked together. 'From the analyses, we learn how the magnetism is distributed on a microscopic scale in materials such as spin glasses. In a spin glass, the magnetic moments on the atoms are distributed randomly. Our research validates particular theories of types of magnetic order and techniques of statistical mechanics, which flow over into many other areas where there are random networks, such as neural networks. It even has relevance to what is known as the "travelling salesman problem". What is the optimum way of getting a salesman to all his customers, which is another random problem? In science, it is amazing how the relevance of something in one area can apply to other areas, which initially were not thought of. A touch of serendipity!' Trevor said.

The gold medal was given to Trevor at the annual meeting of the AINSE Council, on Thursday 28 May, at which he made a presentation on 'flipping neutrons' which was very well received.

In his presentation he described how novel ways of producing and handling polarised neutrons have been necessary to effectively contribute to the characterisation of magnetic systems on a medium flux reactor. These methods were described and recent examples of the power of the neutron polarisation analysis technique for the understanding of several magnetic materials were discussed.

For further information contact Dr Hicks at Trevor.Hicks@sci.monash.edu.au

Congratulations from us all Trevor

Dr Trevor Hicks received his Ph.D. from Monash University in 1966 and subsequently held two postdoctoral positions at Harwell and Oak Ridge National Laboratory. He returned to Australia to a lectureship in the Department of Physics, Monash University and is currently Reader in Physics.

His main research interest is the magnetism of disordered systems for which he has developed novel polarised neutron techniques over the past twenty five years. He has served on the Neutron Diffraction Commission of the International Union of Crystallography and on the Magnetism Commission of the International Union of Pure and Applied Physics. In the latter capacity he was a member of the selection committee for the triennial International Prize in Magnetism and facilitated the holding of the International Conference on Magnetism in Australia in 1997, the largest international conference in the physics area to be held in Australia, for which he was Programme Chairman.

Dr Hicks has published in excess of one hundred refereed papers in neutron scattering and magnetism and is the author of the book "Magnetism in Disorder" published by Oxford Press.