

# Plenary Speakers

## **Professor John Barrow**

### *The Origin of the Universe*

John D Barrow is Professor of Mathematical Sciences at the University of Cambridge. His research is in the area of cosmology and gravitation theory. He is particularly interested in the very early history of the universe and the ways in which astronomical observations can be used to test theories of high-energy physics and the constancy of the constants of Nature. He is also the Director of the Millennium Mathematics Project, at Cambridge, a new program to raise public awareness of mathematics and its scientific applications. He is the recipient of the Locker Award for astronomy and the Kelvin Medal. He is a frequent lecturer to audiences of all sorts and the author of many books about science and mathematics for the general public, including 'Theories of Everything', 'Impossibility', 'Between Inner Space and Outer Space', 'The Origin of the Universe', and most recently, 'The Book of Nothing'.

## **Professor Mike Kelley**

### *Exciting New Discoveries in Ionospheric Science*

Professor Michael C Kelley has been deeply involved in ac/dc electric field experiments in space since 1966. He has played an important role in supplying electronics and/or analysing results for 70 rocket flights, 4 satellite missions and numerous balloon flights. Since moving to

Cornell in 1975, he has also performed experiments for neutral wind measurements using chemical tracers, for active experiments in space plasmas and for scatter radar measurements of turbulence and dc electric fields. He has published more than 200 papers in the refereed literature, several of which were review papers concerning ac electric field and plasma density fluctuation measurements in the ionosphere and along auroral zone magnetic field lines. He was an Associate Editor of the Journal of Geophysical Research, has served on a number of advisory panels for NSF and NASA, was Chairman of the NSF CEDAR Steering Committee, and served as Adjunct Director of Atmospheric Science at the National Astronomy and Ionospheric Center. Currently, Dr Kelley is Chair of the National Academy of Sciences Committee on Solar Terrestrial Research, serves as Adjunct Director of Atmospheric Science at the National Astronomy and Ionospheric Center, and is Associate Dean for Professional Development in the College of Engineering.

## **Professor Michael Hough**

### *Physics Education in a Globalizing Economy where Knowledge and Information are Competitive Advantages*

Professor Michael Hough holds Professorships in both Management in the Business School, and in Educational Leadership in the Faculty of Education at the University of Wollongong. He has been a Science Teacher and Head of a Science Department in NSW State High Schools. He lectures extensively on quality management, and the impact of technology on societal and business practices. He has just

completed a 7 month period of sabbatical leave at the University of Texas at Austin and University of Georgia in the USA; and at the University of Portsmouth in the UK. During this time, he reviewed the scope and impacts of new technologies and updated his thinking on quality management and project management.

## **Professor Dean Zollman**

### *Teaching Quantum Mechanics to Everyone: Can it be done with Technology?*

Professor Dean Zollman received his BS and MS from Indiana University, Bloomington and PhD in theoretical nuclear physics from the University of Maryland, College Park. In 1972 he was hired as an assistant professor by the Department of Physics at Kansas State University to begin a physics education research group. Since that time his research has been devoted exclusively to studying how students learn physics and to developing materials which improve that learning. He was promoted to Associate Professor in 1977 and to Professor in 1982. Dr Zollman also holds an appointment in Secondary Education and has graduate students in both Physics and Science Education.

Professor Zollman has twice been a Fulbright Fellow in Germany. In 1989 he worked at Ludwig-Maximilians University in Munich on development of measurement techniques for digital video. In 1988 he visited the Institute for Science Education at the University of Kiel where he investigated student understanding of quantum physics.

In 1996 the Carnegie Foundation for the Advancement of Teaching named him the Doctoral University Professor of the Year.

In recent years, he has concentrated on research and development in the use of technology for teaching physics and on providing materials to physics teachers, particularly those teachers whose background does not include a significant amount of physics. He is co-author of six videodiscs for physics teaching, including 'Puzzle of the Tacoma Narrows Bridge Collapse' - the first commercially available interactive videodisc for physics teaching. He was the director of software development for the 'Physics InfoMall', a large database for high school physics teaching. At present Professor Zollman is leading the Visual Quantum Mechanics project to develop materials for teaching quantum physics to three different groups of students - non-science students, science and engineering students, and students interested in biology and medicine.

## **Professor Victor Ninov**

### *Production and Structure of Super-Heavy Metals*

Professor Victor Ninov achieved his BS in Physics in 1987 and his PhD in Nuclear Physics in 1992, from the University of Darmstadt. Present areas of research include heavy element isotope production by compound-nucleus formation; the study of the alpha-decay properties of Heavy Elements ( $Z > 100$ ); the design and implementation of detector, target and data acquisition systems; software for ion optical design of magnetic spectrometers, ion traps and storage rings and he is also studying the nuclear decay properties of neutron deficient isotopes along the neutron shell at  $N=126$  and  $152$ .