ALAIN ASPECT

CITATION FOR AN HONORARY DEGREE

Mr Chancellor, it is my privilege to present for a degree of the University, Professor Alain Aspect.

Alain Aspect was born in Agen, France in 1947. He studied at the École Normale Supérieure de Cachan in France. He has worked as a researcher in quantum optics and atomic physics in Institut d'Optique and Ecole Normale Supérieure and has had placements as a teacher in France and Africa. He is now a Professor at the renowned École Polytechnique, and a CNRS Distinguished Senior Scientist. He is a member of both the French Academies of Sciences and Technologies. In 2008 he was elected a member of the US National Academy of Sciences. In 2005 he was awarded the gold medal of the Centre National de la Recherche Scientifique, the most prestigious recognition for a researcher working in France.

Alain Aspect is acknowledged internationally as a pioneer in the field of quantum physics. In the early 1980s he carried out the first comprehensive experimental tests that fully showed the validity and necessity of the quantum concepts of entanglement, which were introduced in the 1930s.

By being the first to produce and measure the properties of single photons with identifiable moments, and by testing the equations introduced by John Bell, Alain Aspect confirmed our present view of the quantum world. This work settled a long standing dispute between Bohr and Einstein about interpretation of quantum physics. While this is fundamental science at its best, it forms the foundation of many technologies that shape our lives. The transistor, the laser and the modern computer are all based on quantum physics and more ideas based on entanglement are yet to come.

In 1985 four experienced scientists in France, including Alain Aspect, launched a team to investigate the cooling of atoms with light and later the generation of a new form of cold matter, a Bose-Einstein-Condensate, and more recently an atom laser. His team pioneered new techniques to cool matter close to absolute zero temperature and showed how we can manipulate atoms with ever increasing precision. Again technological advances, such as better navigation with GPS and exploration for water and minerals with atom interferometers, will be some of the future rewards.

In summary, Alain Aspect's pioneering contributions over the last 30 years triggered a revolution in experimental physics. In addition he is a gifted teacher and mentor, and many of the graduate students who have trained with him are now leading scientists who are setting the agenda for the development of future quantum technology.

Alain Aspect maintains a keen interest in developments in science in Australia. Over many years he has developed a close connection to Australia, and The Australian National University in particular, through his role as Senior Advisor to the Centre of Excellence for Quantum Atom Optics led by ANU.

Mr Chancellor, it is with pleasure that I present to you Alain Aspect that you may confer on him the Degree of Doctor of Science, *honoris causa,* on the ground of his outstanding creative achievement in physics.

Professor Ian Chubb AC
Vice-Chancellor
The Australian National University
12 December 2008