

Honorary Fellowship Citation, 6th July 2004:

Chairman, Principal, Ladies and Gentlemen:

I present **Emeritus Professor Peter Kalmus, O.B.E.**

Peter was born in Prague into what turned out to be a family of scientists. He was both undergraduate and postgraduate at University College, London. He obtained his PhD in the year of Sputnik, 1957, and then remained at UCL for a further three years as a Research Associate. In a basement room, just off Gower Street, he helped design and build an electron accelerator. He devised an ingenious system to measure the beam energy using the fact that, in a medium, particles may travel faster than the local velocity of light. Peter was made a Fellow of UCL in 2001.

The fifties was still the age when one did not need half of the Alps to do particle physics, but he soon learned to think big and in 1960 joined the Argonne National Laboratory in the USA, carrying out particle physics experiments both there and at CERN, the European Laboratory near Geneva, for the next few years.

He came to Queen Mary in 1964, forty years ago, and for many years led the particle physics group in subtle experiments that contributed to our present understanding that the newly discovered zoo of sub-nuclear particles were made of quarks.

In 1978, he became Professor of Physics at Queen Mary and began work on the design and construction of the UA1 detector for the CERN Super Proton Synchrotron Collider.

[It was at this stage that Peter made the step that many said was the biggest mistake of his life, though I do tend to think differently, because that step was to hire me!]

It is hard to exaggerate the technical difficulties that the Super Collider project presented. Of course anti-matter had already long since been discovered but this project demanded not just that antiprotons be produced, but that they were then controlled sufficiently. The need was to make a beam of these particles, just tens of microns wide, that could accurately circle an existing accelerator 7km in circumference and then strike, head-on, a corresponding beam of protons travelling in the opposite direction. The sub-text was to beat the Americans to producing the highest energies available in the smallest volume. The reason for this was that there might be a chance of creating a family of fundamental particles that had been predicted to exist, orders of magnitude more massive than anything seen before.

This indeed happened in 1983. Out of more than a billion recorded collisions, a few dozen or so were identified that bore the unmistakable predicted signatures. The celebrated discovery of the so-called W and Z bosons had been made. These particles have a mass, or weight, somewhat close to that of a whole atom of silver, whilst having a size which, in comparison, is something like less than a grain of sand is to the distance between here and Paris! Having been created, these particles stick around for

some 10^{-23} of a second, and then decay. What a waste! Nevertheless their transient existence gave the experimental proof that unified two of nature's four fundamental forces, the common force of electromagnetism, with which we are all familiar, and that of the weak interaction which is responsible for so many radioactive decays. For his involvement in these achievements, Peter later shared the Institute of Physics Rutherford Medal.

Peter went on to work at the DESY laboratory in Hamburg where, to this day, high energy electrons or positrons are used, in a similar but up-dated colliding beams technique, to strike protons head-on and thus probe their internal structure with a resolution of some $1/10,000$ their diameter. This is truly the world's biggest and best electron-microscope.

Peter did not duck administrative roles. He was Head of the Physics Department at Queen Mary from 1992 to 1997.

Over the years he has held high office in many learned Societies. He was elected to Fellowship of the Institute of Physics in 1967 and rose to become Vice President. He served on the Council of the British Association, and also became Vice President of the Royal Institution. He served on ICFA, the International Committee for Future Accelerators and was Vice-President of the International Union of Pure and Applied Physics.

[Until I began to think about preparing this talk, I'd quite forgotten how many "Vices" Peter had!]

Peter nominally retired in 1998 with more than 230 publications to his credit. Since then he has given in excess of 130 popular-level talks to audiences totalling 22,000 people. This included lecture tours across both South Africa and India. He has probably single-handedly explained the concept of anti-matter, and its role in the creation and evolution of our Universe, to more lay people than any other world-scientist. He was awarded the Kelvin Medal for the Public Understanding of Science. In 2001 he received an OBE "for services to Physics". Justly so.

Chairman, for his outstanding contributions to particle physics, I present Professor Peter Kalmus for admission as an Honorary Fellow of the College.

Graham Thompson 6th July 2004