Samuel C. C. TING nació en Michigan (USA) en 1936. Desde 1936 a 1956 residió en China. En 1956 volvió a los Estados Unidos e hizo sus estudios de Licenciatura y Doctorado en la Universidad de Michigan (terminó el doctorado en 1962). En 1963 fue becario de la Fundación Ford para trabajar en el CERN. En 1965 Instructor en la Universidad de Columbia (Nueva York) y en 1966 Jefe de Grupo de Investigación en DESY (Alemania). En 1969 fue nombrado Profesor del MIT.
El Profesor Ting es miembro del Consejo Editorial de varias revistas: Nuclear Instruments and Methods, Mathematical Modeling, etc. Es miembro de la Academia de Ciencias de los Estados Unidos y ha recibido varios premios, como el Ernest Orlando Lawrence, la medalla Eringen de la "Society of Engineering Science" y el Premio Nobel de Física de 1976. Es también Profesor del Instituto Thomas Dudley Cabot y actualmente dirige el experimento L3 del CERN. Es autor de un centenar de trabajos de investigación. Desde 1980 mantiene colaboraciones de investigación con la Unidad de Partículas del CIEMAT.

THE FUTURE OF HIGH ENERGY PHYSICS

High Energy Physics is in the frontier of human intellectual activities with a history over three thousand years. It consists of searching for the fundamental building blocks of nature and for the forces holding these fundamental blocks together.

Three thousand years ago, the Greeks viewed the earth, fire, water and air as the basic elements of nature. Around 1000 a.d., sulfur, salt and mercury were added as additional basic elements of nature. In the 17th century, chemical elements were discovered and, indeed, by the end of the last century one hundred or so chemical elements were recognized as the most basic elements of nature. However, the discovery of electrons and protons changed fundamentally our concept of the universe. Instead of viewing the one hundred chemical elements as the fundamental building blocks of nature, we realized that the world was made of two elements: electrons and protons. In this century, through the construction of accelerators, many electron-like and proton-like particles were discovered and collectively called "sub-atomic particles". Indeed, by 1960, we came to view a few one hundred sub-atomic particles as the basic elements of nature.

In the late 1960's and early 1970's we realized that there were even smaller particles (the quarks and leptons). At the beginning of 1970, the three quarks and the three leptons were viewed as the basic elements of nature. Then, the fourth quark was discovered in 1974 and the fifth, in 1975, so that the five quarks and leptons were thought of as the most basic elements of nature.

Thus the purposes of High Energy Physics are to answer the following questions:

- *How many quarks are there? Are there smaller particles than quarks?*
- *How many leptons are there? Can leptons be divided into smaller particles?*
- *Do the forces binding quarks and leptons have a common origin?*
- *What is the origin of the masses of elementary particles?*

Spain has had a good tradition in high energy physics. In the recent years, the work of Alvaro DE RUJULA has been fundamental in identifying the origin of strong nuclear interactions (gluons). The experimental physics team of Juan Antonio RUBIO (from Junta de Energía Nuclear, Madrid) working on the electron-positron colliding beam accelerator PETRA, in Hamburg, was the first to see the link between weak forces and electro-magnetic forces.

Spanish physicists were among the first to propose experiments at the Large Electron Positron beam accelerator (LEP), at CERN. In these experiments, Spanish physicists, from DELPHI, ALEPH and L3 will be searching for new quarks, new leptons and for the origin of masses of elementary particles. Spanish physicists have made a major contribution in these experiments.

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