AWARDS

Tullio Regge

Heineman Prize

Tullio Regge, professor of physics at the University of Turin, was awarded the 1964 Dannie Heineman Prize for Mathematical Physics on April 29, during the Washington meeting of the American Physical Society. He was cited for "important papers introducing into particle theory the concept of analytic continuation in angular momentum".

Since 1961, the evolution of the theory of strong interactions has largely depended on Regge's discovery, according to Geoffrey Chew of the University of California at Berkeley. Dr. Regge's original papers, which appeared in 1959 and 1960, were in potential scattering theory. Theoreticians have found explicit solutions for the scattering amplitude only for a few very simple potentials. For more complicated potentials (in particular, superpositions of Yukawa potentials), they have had only limited success. They were able to find the behavior of the scattering amplitude, A, for large values of energy and fixed angular momentum, l, and they could find the analytic properties of A in the complex energy plane for fixed momentum transfer.

What Dr. Regge did was to prove that the scattering amplitude was an analytic function of the continuous complex variable, l, for fixed energy (although physically only integral values of angular momentum can exist). He developed an interpolation procedure for calculating the singularities in the scattering amplitude. The singularities are now known as Regge poles. In the complex angular momentum plane, the path traced out by the Regge pole as a function of the energy is evaluated. The path is called a Regge trajectory.

For large values of momentum transfer, the Regge pole that is furthest to the right in the complex l plane dominates the scattering amplitude. This pole corresponds to a resonance whenever it is near an integral value of l. Hence, by evaluating the behavior of the scattering amplitude for high momentum transfer, Regge's results implied that the position of resonances could be found.

Particle physicists pounced on Regge's idea and tried to extend it to the theory of strongly interacting particles. They plotted the mass and spin angular momentum, J, of known elementary particles. Then they drew straight lines between those which shared all other quantum numbers except J, and had $\Delta J=2$. These straight lines correspond to Regge trajectories. By means of these plots, the known particles could be organized. It should be possible to predict the existence of new particles along the trajectories, but none has as yet been found.

Theoreticians hoped that, by looking at the high-energy behavior of the scattering amplitude, they would gain complete information about the amplitude, but this hope has not yet been realized. However, the idea of looking at the properties of the scattering amplitude in the complex l plane has been, and probably will continue to be, useful in understanding the dynamical properties of strongly interacting particles.

The \$2500 Heineman Prize, endowed in 1959 by the Heineman Foundation for Research, Educational, Charitable, and Scientific Purposes, Inc., is presented under the auspices of the American Institute of Physics and the American Physical Society to encourage research and to recognize outstanding contributions to the published literature in mathematical physics. The endowment fund is administered by the Institute and the prize is awarded to an individual selected by a committee of the Society. Previous recipients of the honor include Murray Gell-Mann, Aage Bohr, Marvin L. Goldberger, Léon Van Hove, and Keith A. Brueckner.

NAS Awards

On the occasion of its 101st annual meeting in Washington, D. C., the National Academy of Sciences presented its Cyrus B. Comstock Award to Chien-Shiung Wu of Columbia University. The award, which is given every five years by the Academy for the most important discovery or investigation in electricity, magnetism, or radiant energy, paid tribute to Dr. Wu's work in providing the first experimental confirmation of the violation of parity.

In their classic paper of 1956, T. D. Lee and C. N. Yang considered the strange case of the unstable K mesons, τ^+ and θ^+, which appear identical in mass and lifetime but different in that one decays into pi mesons of odd parity and the other into pi mesons of even parity. Lee and Yang chose to assume that in the realm of weak interactions the principle of parity conservation might be violated and that τ^+ and θ^+ might be two different decay modes of the same particle. On the basis of existing experimental information, they concluded that there was no evidence either to confirm or refute parity conservation in weak interactions, and suggested ways of testing the question.

Within a few months, Dr. Wu, in collaboration with E. Ambler, R. Hayward, D. D. Hoppes, and R. P. Hudson of the National Bureau of Standards, demonstrated conclusively that the parity law does not hold in the beta decay of oriented cobalt-60 nuclei. Their procedure was described by Dr. Wu as follows: The essence