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Particle theorists win Dirac Medal

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James Bjorken of Stanford University and Curtis Callan of Princeton University have been awarded the 2004 Dirac Medal for their work on the theory of the strong interaction. The award is made every year by the Abdus Salam International Centre for Theoretical Physics in Trieste to recognise scientists who have made outstanding contributions to theoretical physics and mathematics.

In the 1960s, Bjorken formulated a law to explain how deep inelastic scattering - a powerful technique for studying the internal structure of protons, neutrons and other hadrons - scaled with energy. The discovery of "Bjorken scaling" in electron-proton collisions led to the identification of point-like particles, which we now know to be quarks, inside the proton. The quarks are confined inside the protons by the strong force. Working with Sheldon Glashow in 1964, Bjorken also presented arguments for the existence of a fourth quark, which they called the charmed quark.

Callan, together with the late Kurt Symanzik, reinvented the so-called perturbative renormalization group. Renormalization is a mathematical procedure that removes infinities from certain equations in the Standard Model of particle physics. Callan applied these methods to deep inelastic scattering and made significant contributions to the foundations of quantum chromodynamics (QCD), the theory of the strong force. In more recent years, he has worked on string theory, quantum gravity and the theory of magnetic monopoles.

The medal is awarded each year on Paul Dirac's birthday - August 8 - and is worth $5000.

For more information, see the Dirac Medal of the ICTP web site.