Cabibbo@60

Friday 15 March 2024 - Saturday 16 March 2024 Department of Physics, Central University of Karnataka

Scientific Programme

In 1961, Feynman and Gell-Mann's theory on Fermi constants in muon and neutron-beta decay demonstrated the universality of weak interactions, revealing a common origin and equal strengths in nuclear and lepton vector currents, simplifying understanding. Concerns about smaller Fermi constants in strange-particle beta decays were addressed by Nicola Cabibbo's 1963 article, which modified the vector-coupling constant by introducing a factor sinθ, where θ is now recognized as the Cabibbo angle, thereby laying the groundwork for the modern unification of electromagnetic and weak interactions. The Cabibbo theory, pivotal upon publication, not only embodied lepton-hadron universality successfully but also hinted at a fundamental theory of weak interactions. The introduction of quark mixing in the theory addressed the suppression of strangeness-changing neutral processes through the GIM mechanism, where the charm quark coupled to a combination of down and strange quarks orthogonal to the Cabibbo combination. Cabibbo's introduction of quark mixing is encapsulated in the Cabibbo–Kobayashi–Maskawa (CKM) matrix, a three-by-three unitary matrix. Over the past 60 years, the CKM scheme has been consistently confirmed through precise measurements and theoretical predictions, serving as a highly successful framework that accurately predicts weak processes and deepens our understanding of CP violation sources in the universe.

Intended Participants:

On the eve of the 60th anniversary of the Cabibbo angle, the planned one-day conference, "Cabibbo@60," will encompass a broad theoretical and experimental High Energy Physics perspective.

The intended participants include B.Sc. Physics, M.Sc. Physics, and Research Scholars (both internal and external), early-stage postdoc fellows with an interest in High Energy Physics. For more details, please contact Dr. Suchismita Sahoo: suchismita@cuk.ac.in