

Third KIA Laureate Fundamental Research



- ◆ **Field:** Physics
- ◆ **Researcher:** Prof. Hsiang-Nan Li
- ◆ **Nationality:** Taipei
- ◆ **Date of Birth:** Jan. 07, 1964
- ◆ **Position:** Research Fellow
- ◆ **Scientific Affiliation:** Academia Sinica
- ◆ **Research work title:** Perturbative QCD approach to Bmeson decays

Abstract: I developed the perturbative QCD (PQCD) approach to B meson decays, which has been widely recognized in the community. Radiative and power corrections to two-body nonleptonic B meson decays can be calculated systematically, so this approach goes beyond the naïve factorization that has been employed for decades. Using PQCD, we have gained control of QCD dynamics in these decays, which helps extracting the standard-model parameters. Our predictions for the direct CP asymmetry in $B^0 \rightarrow \pi^+ K^+$ and for many other quantities have been confirmed by the B factories BaBar and Belle. The known puzzling data of small longitudinal polarization fractions in $B \rightarrow V$, and of the dramatically different direct CP asymmetries between the $B^0 \rightarrow \pi^+ K^+$ and $B^+ \rightarrow \pi^0 K^+$ may be resolved in PQCD. To demonstrate the constraint on new physics models from B factory data in our framework, we have studied effects of the sequential fourth generation quarks on penguin-dominated nonleptonic B meson decays.

Biography: Prof. Hsiang-Nan Li received his bachelor degree from National Taiwan University in 1986, and his PhD from State University of New York at Stony Brook in 1992. He was an Associated Professor of National Chung-Cheng University and a Professor of National Cheng-Kung University, and became a Research Fellow of Academia Sinica in Taipei since 2001. Prof. Li is an expert on perturbative Quantum Chromodynamics (PQCD), and famous of his development of the PQCD approach to nonleptonic B meson decays. This approach has been widely recognized and adopted in the community. His prediction for the direct CP asymmetry in the $B^0 \rightarrow \pi^+ K^+$ modes, confirmed by the B factories later on, rendered him a world renowned B physicist. This work has accumulated more than 500 citations according to the Spire database. Prof. Li has published 90 papers in top journals with around 4,400 total citations so far, served in advisory boards of several prestigious Research Centers, and won a number of honors and awards.