

The 165th HENPIC seminar by Prof. Jiangming Yao, Sun Yet-sen University, May 26, 2022, Thursday 10:30am (Beijing time)

Title: Advances in modeling nuclear matrix elements of neutrinoless double beta decay

Abstract: Nuclear weak decays provide important probes to fundamental symmetries in nature. In particular, an observation of the hypothetical neutrinoless double-beta ($0\nu\beta\beta$) decay would unambiguously demonstrate the Majorana nature of neutrinos and the existence of the lepton-number-violation process. It would also provide unique information on the ordering and absolute scale of neutrino masses. The next-generation tonne-scale experiments will probably provide a definite answer to these fundamental questions based on our current knowledge of the nuclear matrix element (NME), the precise determination of which is a challenge to nuclear theory and requires comprehensive knowledge of both the strong and weak interactions in the nuclear medium and of the dynamics of quantum many-body systems. In this seminar, the advances in the studies of the NME assuming the standard mechanism of an exchange of light Majorana neutrinos will be highlighted. The challenges and prospects will be discussed.

About the speaker: Jiangming Yao received his doctorate degree from Peking University in 2009. After holding research positions at Southwest University, Université libre de Bruxelles, Tohoku University, the University of North Carolina at Chapel Hill, and Michigan State University, he joined Sun Yat-sen University in 2021 as a full professor. His research interest is nuclear theory and its application to interdisciplinary fundamental problems in nuclear physics, particle physics, and astrophysics.