Discovery of a Glueball-like Particle X(2370) at BESIII

NBI Particle Physics Seminar

Speaker: Prof. Dr. Shan Jin
Nanjing University

Date/time: August 25th, 2025, at 2.00 PM (CET)

Location: NBB Margrethe Bohr Hall

Abstract:

Radiative decays of the J/ψ particle are of gluon-rich environment, providing an ideal place for hunting glueballs. The X(2370) particle was first discovered in $J/\psi \to \gamma\pi^+\pi^-\eta'$ process in 2011 with the BESIII experiment at BEPCII Collider, and later it was confirmed in $J/\psi \to \gamma K\bar{K}\eta'$ decays. In 2024, with a sample of 10 billion J/ψ events collected at the BESIII detector, the spin-parity of the X(2370) was determined to be 0^{-+} for the first time in the partial wave analysis of $J/\psi \to \gamma K_S^0 K_S^0 \eta'$process. Recently, new decay modes $X(2370) \to K_S^0 K_S^0 \pi^0$, $\pi^0\pi^0\eta$ and $a^0\pi^0$ were observed. The mass, spin-parity quantum numbers, production and decay properties of the X(2370) particle are consistent with the features of the the lightest pseudoscalar glueball.

Speaker:

Prof. Shan Jin received his Ph.D. in 1995 at the Institute of High Energy Physics (IHEP), Chinese Academy of Sciences, following a postdoc at University of Wisconsin-Madison, USA. In 2001, He was a professor at IHEP and Deputy Director of Experimental Physics Center of IHEP. Since 2017, he has been a professor at the Physics School of Nanjing University.

Chair: You Zhou, High Energy Heavy-Ion Physics (HEHI) Group

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