

Addressing the CP-strong problem with two heavy axions

Sunday, 25 October 2026 14:40 (20)

We present a mechanism to solve the CP-strong problem with two heavy axions in a composite Higgs . An $Sp(8)$ technicolour group drives electroweak symmetry breaking by producing the Higgs as a pseudo-Nambu-Goldstone boson of the associated flavour symmetry breaking. The same sector generates the Standard Model Yukawa hierarchies through fundamental partial compositeness. At high energy, colour and technicolour are unified into $SU(11) \times Sp'(8)$, a UV completion engineered so that the two physical axion masses receive contributions both from $Sp'(8)$ small instantons and from the $Sp(8)$ confinement scale, naturally raising them well above the QCD axion mass. We analyse the pseudo-Nambu-Goldstone boson spectrum of the technicoloured sector, the resulting axion mass matrix, and the flavour structure of the Standard Model.

Primary author(s) : DI RISI, Vigilante (ICTP-AP, University of Chinese Academy of Science)

Co-author(s) : Prof. CACCIAPAGLIA, Giacomo (LPTHE); MA, Teng (ICTP-AP); Dr JIANG, Xu-Hui (ICTP-AP); Mrs LIN, Dan (ICTP-AP)

Presenter(s) : DI RISI, Vigilante (ICTP-AP, University of Chinese Academy of Science)

Session Classification : Particle Phenomenology (Room B)