

Semiclassical analysis of the bifundamental QCD with anomaly-preserving T^2 compactification

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Bifundamental QCD, an $SU(N) \times SU(N)$ gauge theory with a bifundamental fermion, has received substantial attention due to its rich phase structure and its notable relevance to the large- N orbifold equivalence. To investigate the vacuum structure and phase diagrams of this model, we employ a semiclassical center-vortex description of the confining vacuum, enabled through anomaly-preserving T^2 compactification under the assumption of adiabatic continuity. In this presentation, we will show how our semiclassical framework explains one of the conjectured phase diagrams previously proposed in literature. Specifically, our results provide positive support for the nonperturbative validity of the large- N orbifold equivalence between bifundamental QCD and $\mathcal{N} = 1$ $SU(2N)$ supersymmetric Yang-Mills theory.

Presenter: Dr HAYASHI, Yui (YITP, Kyoto University)

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