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Do we still need quark model?

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The quark model has long been a cornerstone for understanding the hadron spectrum. However, in recent years, numerous hadrons have been observed experimentally that fall outside the predictions of the traditional quark model. Meanwhile, theoretical advancements in methods more closely aligned with QCD—such as chiral effective field theory, the Dyson-Schwinger equation formalism, and lattice QCD—have gained prominence. These developments appear to have pushed the quark potential model into a corner.

In this talk, I will revisit the significance of the quark model and explore what kind of quark model is needed to adapt to the demands of this new era. I will present a benchmark test of the quark model using various potentials and few-body approaches. Additionally, I will introduce an automated, high-precision package designed for studying multiquark resonance systems.

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