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A New Era of Symmetries in the Hadronic Interaction[1]

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The search for a weak component of the nuclear force began in 1957, shortly after the proposal of parity violation. While it has been observed in compound nuclei with large nuclear enhancements, a systematic characterization of the hadronic weak interaction is still forthcoming almost sixty years later. New experimental facilities and technology have rejuvenated efforts to map out this "complexity frontier" within the Standard Model, and we will soon have precision data from multiple few-body experiments. In parallel, modern effective field theories have provided a systematic model independent description of the hadronic interaction with estimates of higher-order effects. The characterization of discrete symmetries in hadronic systems has recently become important for the design and analysis of other precision symmetries measurements, for example, electron PV scattering and time-reversal violation experiments. These new developments in experiment, theory, and application have ushered in a new era in hadronic parity violation.

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