QCD Phenomenology from a Novel Improved Fermion Action

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I will present an overview of recent advances in our understanding of QCD facilitated by a new form of improved fermion action known as FLIC fermions. This action provides near continuum limit results at finite lattice spacing and allows the direct simulation of hadron properties at light quark masses. The latter is key to directly revealing chiral nonanalytic behavior in hadron observables such as baryon magnetic moments where such behavior is expected to be large, even in the quenched approximation. We'll explore QCD vacuum structure and the manner in which FLIC fermions suppress artifacts at the scale of the lattice spacing, key to an efficient and topologically correct implementation of chiral fermions on the lattice. Finally the current state of baryon-resonance spectroscopy obtained in lattice QCD will be summarized, where new results on odd-parity spin-3/2 nucleon resonances will be presented.