Nuclear Physics Approach to Exotic Hadrons
(*The Third Greatest Story Ever Told)*

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ABSTRACT

Quantum Chromodynamics (QCD) not only predicts states with two and three quarks but also hadrons (exotica) with no quarks (glueballs), quarks and gluons (hybrid mesons and baryons) and multi-quark states (quarks in conventional and exotic color configurations, tetraquarks, pentaquarks, etc.). There is very limited and incomplete data regarding exotica but a dedicated program at Jefferson Lab (GlueX, which has a significant FSU presence) has just completed the first phase of experiments and new information is soon expected. Although lattice QCD is regarded as the default theoretical treatment, this talk details how a nuclear physics approach can provide useful insight and understanding of both conventional and exotic hadrons. Calculations in which an approximate QCD Hamiltonian is diagonalized utilizing several many-body techniques (Hartree-Fock, BCS, RPA, coupled-channels and variational) will be presented for light and heavy mesons, glueballs, hybrids, tetraquarks and their mixing.