Abstract Submitted
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Nucleon Structure in realistic QCD on a lattice[1] SERGEY SYRITSYN, RIKEN/BNL Research Center, TOM BLUM, University of Connecticut, MICHAEL ENGELHARDT, NMSU, JEREMY GREEN, Mainz University, Germany, TAKU IZUBUCHI, CHULWOO JUNG, BNL, STEFAN KRIEG, Juelich Supercomputer Center, Germany, MEIFENG LIN, BNL, STEFAN MEINEL, JOHN NEGELE, MIT, SHIGEMI OHTA, BNL, ANDREW POCHINSKY, MIT, EIGO SHINTANI, BNL, MICHAEL BUCHOFF, University of Washington, CHRIS SCHROEDER, JOSEPH WASEM, LLNL — I will present recent advances in computing nucleon structure from first principles on a lattice and discuss their connection to current experiments. Making reliable predictions from Quantum Chromodynamics requires numerical methods. After decades of development of theory and computing, lattice QCD is now capable of calculations with realistic parameters. Calculating structure of the proton and the neutron is critical to both validating lattice QCD methods and providing theory counterpart to modern experimental efforts to study hadron structure, with proton charge radius, electromagnetic form factors, and proton spin origin being the most notable. In addition, searches for deviations from the Standard Model, such as neutron-antineutron oscillation, require specific nucleon matrix elements, which can be computed only on a lattice without model assumptions.

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