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JOHANNES GUTENBERG UNIVERSITÄT MAINZ

PRISMA+ Colloquium

Jan. 22, 2020 at 1 p.m.
Lorentz-Raum 05-127, Staudingerweg 7

Assumpta Parreno
Universitad de Barcelona

Lattice QCD calculations for Nuclear Physics

A central goal of Nuclear Physics is to obtain a first-principles description of the properties and interactions of nuclei from the underlying theory of the strong interaction, Quantum Chromodynamics (QCD). Being the theory that governs the interactions between the basic building blocks of matter, quarks and gluons, it is also responsible for confining those primary pieces into hadronic states, binding neutrons and protons through the nuclear force to give the different elements in the periodic table. Nevertheless, due to the large complexity of the quark-gluon dynamics, one cannot obtain analytical solutions of QCD in the energy regime relevant to nuclear physics. In order to address this problem, numerical solutions of QCD can be obtained in a finite volume through its formulation in a Euclidean discretized space-time. I will present the results of our study in the two-baryon sector for different values of the light quark masses, as well as for the very light A=3,4 nuclei.

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