

Abstract Submitted
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Chiral **Effective**
Field Theory and Nucleonic Matter¹ FRANCESCA SAMMARRUCA, Uni-
versity of Idaho — The main features and strengths of chiral Effective Field Theory
(EFT) can be summarized as follows: 1) the framework of chiral EFT has a firm
connection with quantum chromodynamics; 2) it represents a method to generate
two- and few-nucleon forces on an equal footing; 3) it allows for systematic im-
provement of the predictions. High-quality two- and three-nucleon forces have been
developed up to fifth and sixth order of chiral EFT. Naturally, the next step is the
application of these forces in the many-body system—the goal of *ab initio* nuclear
physics and a task of formidable complexity. In spite of recent progress, we are still
faced with serious problems. One of them concerns the proper quantification of the
uncertainty in predictions of structure and reaction observables. A related issue is
whether the order-by-order convergence of the chiral expansion in the many-body
system is satisfactory. I will illustrate the above problems by way of representative
examples of nucleonic matter and nuclear structure issues. Specifically, I will also
discuss recent EFT-based predictions of the symmetry energy and the pressure in
neutron-rich matter in relation to recent constraints from heavy-ion collisions.

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