

Review of Shell Model Approaches in Nuclear Physics *

D. J. Dean¹,

¹*Physics Division, Oak Ridge National Laboratory, Oak Ridge, TN 37831, USA*

Short of a complete solution to the many-nucleon problem, the interacting shell model is widely regarded as the most broadly capable description of low-energy nuclear structure, and the one most directly traceable to the fundamental many-body problem. In order to apply the shell-model successfully, one must develop reliable two-body effective interactions. The second problem to be overcome is to determine observable quantities from a given Hamiltonian. Progress has been made in both areas, and I will review some of the more recent developments. I will also review the progress made in the last few years in shell model applications to nuclear systems far from β -stability. Specifically, I will discuss shell-model applications in the medium-mass cross-shell region near ^{32}Mg , the ^{100}Sn region, and in nuclei near the r-process $N = 80, 126$ waiting points.

I will also discuss future directions and applications that will be required of the shell model in order to effectively solve problems relevant for work in RIA structure physics and in nuclear astrophysics where nuclear structure often plays a crucial role.

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