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Symmetries in nuclei: New methods and applications¹

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When a symmetry is a “good” symmetry of the nuclear system, as in the dynamical symmetries of the shell model and interacting boson model, this symmetry can directly give the spectroscopic properties of the nucleus, without the need for involved calculations. However, even if a symmetry is strongly broken, it nonetheless provides a calculational tool, classifying the basis states used in a full computational treatment of the many-body problem and greatly simplifying the underlying computational machinery. The symmetry then serves as the foundation for a physically meaningful truncation scheme for the calculation. This talk will provide an introduction to new applications of symmetry approaches to the nuclear problem, including the required mathematical developments.

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