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## The atomic nucleus : A natural laboratory of complexity

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The understanding of the structural properties of nuclei is a long-standing issue. Indeed, the underlying complexity of a many-body fermionic system in strong interaction, led to the arising of wide panel of phenomena and behavior. Thus an universal treatment of such properties is particularly challenging. We'll give a short overview of the usual techniques used to describe nuclear properties, illustrating each method with several example. Moreover we will discuss the impact of state-of-the-arts nuclear models, on observables of use in apparently unrelated fields, in particular Cosmology. To conclude I'll try to emphasize the link between theoretical description and experimental observables.

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