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Nuclear Density Functional Theory: general aspects and interpretation of recent experiments

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In this contribution, the nuclear Density Functional Theory (DFT) will be briefly introduced and confronted with other nuclear structure models. This introduction will be tailored for a general audience. Some state-of-the-art Energy Density Functionals (EDFs), as well as their predictive power and their current limitations, will be discussed.
It will be emphasised that one of the main advantages of DFT is the capability to treat excited states, throughout the whole isotope chart. Shell structure evolution, collective nuclear properties and connections with the nuclear Equation of State (EoS) are some of the physics problems that can be addressed. Accordingly, in this contribution, a few applications of DFT and extensions thereof will be highlighted, by focusing on both single-particle and collective spectroscopy. The theoretical results will be compared with the outcome of inelastic scattering and transfer experiments. In particular, a few recent data from ISOLDE, on the evolution of single-particle states, will be also discussed.

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