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Testing Nuclear Theory On Light Nuclei: Electromagnetic Observables

Atomic nuclei play a central role in processes that govern the synthesis of chemical elements, provide unique laboratories for probing fundamental interactions, and offer critical tests of the Standard Model of particle physics. Recent advances in nuclear theory, combined with the power of high-performance computing, now enable unified ab initio calculations of nuclear structure and reactions for increasingly complex systems—alongside quantifiable theoretical uncertainties. In this talk, I will present recent breakthroughs in ab initio methods for light nuclei, emphasizing their impact on contemporary challenges in modeling electromagnetic reactions, where precise theory-experiment comparisons allow stringent tests of nuclear theory.

Primary author: BACCA, Sonia (Johannes Gutenberg University Mainz)

Presenter: BACCA, Sonia (Johannes Gutenberg University Mainz)

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