

## Ab initio Nuclear Calculations for Dark Matter Detection and CEvNS

*Friday 24 May 2024 10:45 (25 minutes)*

Over the past decades, ab initio nuclear calculation has made dramatic progress, especially reaching the heavy mass region as  $^{208}\text{Pb}$  recently. This means that it becomes possible to obtain first-principles computation (with quantified uncertainties) of quantities which even reside in the heavy-mass region. The quantities include these relevant for astrophysics and searches for physics beyond the Standard Model. In this talk, I will present a conceptual introduction to modern ab initio theory. Then, I will focus on recent advances in ab initio calculations of nuclear responses for dark matter (DM) direct detection and coherent elastic neutrino-nucleus scattering (CEvNS), including nuclei  $^{19}\text{F}$ ,  $^{23}\text{Na}$ ,  $^{27}\text{Al}$ ,  $^{28-30}\text{Si}$ ,  $^{70,72-74,76}\text{Ge}$ ,  $^{127}\text{I}$ ,  $^{133}\text{Cs}$ , and  $^{128-132,134,136}\text{Xe}$ .

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