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Nuclear Isomers in Nucleosynthesis

In most astrophysical environments, the transitions among excited states of a nucleus occur more rapidly than those between the nucleus and other nuclei. In this case, the nucleus can be considered to be internally equilibrated. In certain interesting cases, however, the nucleus may possess a long-lived isomer that communicates inefficiently with the ground state. In the nucleosynthetic environment, the isomer equilibrates with the ground state via transitions to upper-lying levels and then cascading back to the ground state. In this talk, I will present the formalism one may use to include this effect in a nucleosynthetic environment and will use the example of s-process nucleosynthesis of the important geochronometer rubidium-87, whose nucleosynthesis is affected by the isomer at krypton-85, as an example.

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