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From Zero to Hero... to Zero? 0νββ-decay, energy frontier probes, and the origin of matter

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Lepton number violation (LNV) is a very attractive research topic for theoretical and experimental physicists due to its implications beyond the Standard Model. It provides feasible theoretical explanations to several open questions in particle physics (e.g., the origin of neutrino mass) and has a rich phenomenology at different energy scales. We explore the underlying connections between neutrinoless double β–decay (0νββ) experiments, hadron colliders, and cosmology observations. In the context of simplified models, we show that future collider and 0νββ experimental results may complement each other.

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