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New Physics beyond the Standard Model: from the Earth to the Sky

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The Standard Model in particle physics has been very successful in explaining the strong, weak and electromagnetic interactions of fundamental particles. There are, however, motivations for new physics beyond the Standard Model. The origin of electroweak symmetry breaking and generation of masses are still unresolved issues. The existence of dark matter and the explanation of matter-antimatter asymmetry also call for new physics beyond the Standard Model. In this talk, I will discuss recent developments in theoretical particle physics and how to discover those new physics scenarios in both high energy colliders and dark matter detection experiments.