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Indirect searches for dark matter: annihilation, decay and collider production

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Models of particle dark matter (DM) that lead to the observed relic abundance today generically predict ongoing annihilation or decay into energetic standard model particles. Effective couplings to the standard model also imply that particle colliders such as the LHC can produce invisible particles which could be detected via enhancements in collision cross sections, or as missing energy and momentum. I will briefly review the theory behind indirect and collider searches, sketching out current constraints. I will then turn to exploring the myriad, complementary searches for DM annihilation and decay products using messengers such as gamma rays, cosmic rays, neutrinos, and the cosmic microwave background, as well as data from stellar astrophysics and cosmology.

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