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Directly Detecting Light Dark Matter

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While the experimental program to detect ever lighter dark matter is proceeding full steam ahead, the theory of such light, detectable dark matter is at a crossroads. I will detail two examples of sub-GeV hadrophilic dark matter models which these future direct detection endeavors may discover while highlighting the serious challenges model builders face. The first achieves probe-able direct detection cross sections by way of a late-time, dark-sector phase transition, while the second does so by assuming the entire thermal bath is reheated at very low temperatures. Both models lead to dark matter-nucleon scattering cross sections of interest for near-future experiments for dark matter masses in the range of 100 keV-100 MeV, often in parts of parameter space with few or no models.

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