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Running a Dark Matter Experiment on a Galaxy

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The hypothesis of Cold Dark Matter (CDM) has been confirmed on the largest scales of the Universe and must now be stress-tested on sub-galactic scales. Many well-motivated and generic alternatives to CDM can leave spectacular signatures on precisely these scales, affecting the evolution of galaxies as well as their population statistics. Excitingly, over the course of the next decade, a flood of astrophysical data will open the possibility of searching for these distinctive imprints and shedding light on key questions about dark matter. I will review the promise of upcoming data as well as recent theory advancements for modeling dark matter physics on these scales.

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