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A Bright Vision for Dark Matter¹

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Dark matter orchestrates the expansion of the universe and the development of the cosmic web of structure, yet its identity is unknown. We know that dark matter molds luminous matter into galaxies, yet the microphysical processes that govern its own creation and evolution remain a mystery. Despite its cosmic importance, the nature of dark matter remains one of the biggest unsolved problems in fundamental physics. However, it is one that may be solved with the tools of astronomy. In this talk, I will show how astronomical observations, building on the pioneering work of Vera Rubin, have shaped our understanding of the microphysical properties of dark matter. I will discuss the exciting prospects for a new generation of astronomical facilities to enable measurements of dark matter physics.

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