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Memory Burden and Ultralight Black Holes : A New Window for Dark Matter

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The memory burden effect describes how the information load carried by a system contributes to its stabilization. This phenomenon is particularly significant in systems with a high capacity for information storage, such as black holes and other entities with maximal microstate degeneracy, commonly. The effect has several key implications. Notably, it slows the further decay of a black hole—mainly after it has radiated approximately half of its initial mass. As a result, light primordial black holes, previously thought to have fully evaporated, may persist and serve as viable dark matter candidates.

I will explore the memory burden effect and its role in solitons and black hole dynamics. I will highlight novel features with potential observational relevance, including the model-independent distribution of stabilized masses for initially degenerate primordial black holes.

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