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Constraints on asteroid-mass primordial black holes from capture by stars

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Primordial black holes (PBHs) in the asteroid-mass range remain a viable and until now unconstrained dark matter (DM) candidate. If these PBHs exist, they could be captured by stars in DM-dominated environments such as dwarf galaxies. The capture probability increases with the stellar mass, and captured PBHs would rapidly destroy their host stars. Using photometric observations from the Hubble Space Telescope, we use the non-observation of this destruction process to place constraints on the PBH abundance, and exclude asteroid-mass PBHs from making 100% of the DM at the 3.7σ level.

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