Séminaire de physique des particules et de cosmologie

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No LIGO MACHO: bounds on primordial black holes as dark matter from gravitational lensing of supernovae

Miguel Zumalacarregui

Berkeley Center for Cosmological Physics and IPhT

Black hole mergers detected by the Laser Interferometer Gravitational-Wave Observatory (LIGO) have revived dark matter models based on primordial black holes (PBH) or other massive compact halo objects (MACHO). These objects would be abundant in the mass range $1 - 100 M_{Sun}$, where rather remarkably, previous bounds were the weakest. I will present constraints on the PBH abundance and mass using the gravitational lensing magnification of type Ia supernovae using current data. Our results rule out the hypothesis of MACHO/PBH comprising the totality of the dark matter at high significance in the mass range $M > 0.01 M_{Sun}$. Eliminating the possibility of a LIGO-mass MACHO constraints early-universe models that produce PBHs and further strengthens the case for lighter dark matter candidates.