

# Figuring out the ancestors of LIGO-Virgo black holes

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Pair-instability supernova (PISN) prevents black-hole formation from stellar collapse within the approximate mass range  $M \in [65, 130]M_{\odot}$ . Such black holes may form hierarchically through merging ancestral black holes, whose properties determine those of the “child” one: mass, spin, and recoil velocity. Crucially, the child will leave its host environment if its “birth recoil” exceeds the corresponding escape velocity, preventing further mergers. I will present a Bayesian framework to obtain the masses and spins of the putative parents of the components black holes of LIGO-Virgo observations, as well as their putative birth recoil. With this, I will discuss the viability of such component black-holes as hierarchically formed depending on the properties of the host environment, focusing on the primary component of GW190521, which squarely populates the PISN gap.

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