

Abstract Submitted
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The Parents of LIGO Black Holes and Their Hometown¹ VISHAL BAIBHAV, Johns Hopkins University — Two of the dominant channels to produce black-hole binary mergers are believed to be the isolated evolution of stellar binaries in the field and dynamical formation in star clusters. Pair instabilities prevent stellar collapse from generating black holes more massive than about 45-60 solar mass. This mass gap only applies to the field formation scenario: repeated mergers in clusters can fill the gap. A similar reasoning applies to the binaries spin parameters. If black holes are born slowly rotating, the high-spin portion of the parameter space (the spin gap) can only be filled by black-hole binaries that are assembled dynamically. I will discuss how such signatures are a smoking gun for the hierarchical origin, and how recent detections (GW190521 and GW190412) fit in this context. I will also talk about how we may be able to reconstruct the properties of progenitors of second-generation black holes.

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