

# Binary black holes detected by LIGO: astrophysical and cosmological implications

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Astrophysical and cosmological implications of merging binary black holes as gravitational waves sources detected by LIGO are discussed. Specifically, the black hole binary properties inferred from the first LIGO GW150914 posed several problems. The high masses and low effective spins of merging black holes in this binary can be explained if they are primordial (PBH) rather than the products of the stellar binary evolution. Such PBH properties are postulated ad hoc but not derived from fundamental theory. We show that the necessary features of PBHs naturally follow from the slightly modified Affleck-Dine (AD) mechanism of baryogenesis. The log-normal distribution of PBHs, predicted within the AD paradigm, is adjusted to provide an abundant population of low-spin stellar mass black holes. The same distribution gives a sufficient number of quickly growing seeds of supermassive black holes observed at high redshifts and may comprise an appreciable fraction of Dark Matter which does not contradict any existing observational limits.