Contribution ID: **11** Type: **not specified**

Chris Byrnes: Determining the origin of LIGO's merging black holes

Wednesday, 4 December 2019 13:00 (45 minutes)

Although there is a reasonably broad consensus that primordial black holes in the mass range detected by LIGO and Virgo cannot make up more than a small fraction of the dark matter, it remains possible that all of the black holes whose merger LIGO has detected were primordial in origin. I will briefly summarise the evidence and challenges behind this claim, and then focus on how current and future data can be used to discriminate between astrophysical and primordial black holes. I will discuss the black hole mass function, the mass ratio of the merging pairs, and how the merger rate is modified by (small) amounts of primordial non-Gaussianity. Finally, I will briefly show that the QCD transition when the horizon mass was about one solar mass may lead to a large enhancement in the formation rate of primordial black holes with mass below the Chandrasekhar mass limit.