

Massive binary black holes from Population III stars

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Population III (Pop III) stars are almost metal-free stars, born from the primordial gas in the Universe. They have eluded any attempt of observation so far. Therefore, we must rely on predictions from the most advanced and detailed stellar evolutionary models to study them. The almost total absence of metals impacts their initial mass function distribution (predicted to be top-heavy), their evolutionary path, and their final fate. For example, Pop III stars are more compact and hotter than their metal-rich counterparts. Moreover, they lose a negligible fraction of their mass via stellar winds during their life. Such properties make them important ionising photon sources and ideal massive black hole progenitors.

In this talk, I will first present the new models of Pop III stars computed with the PARSEC stellar evolutionary code. Then, I will show the large sets of Pop III and Population II binary populations computed with the SEVN code used to study the formation channel of binary black hole mergers.

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