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Type : **Poster**

Quantifying the Effect of a Bottom-Light IMF on Globular Cluster Evolution Using the Cluster Monte Carlo Code

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The distribution of stellar masses within a globular cluster (GC) at the time of formation, referred to as the Initial Mass Function (IMF), is directly linked to the evolution of the cluster, including the rate of binary black hole (BH) mergers that produce gravitational waves. Recent studies suggest that GCs may have formed with a bottom-light IMF, meaning fewer low mass stars and more BH progenitors per unit cluster mass compared to the standard Kroupa (2001) IMF. In this study, we evolve a small set of simulated GCs with a bottom-light IMF using the Cluster Monte Carlo code, which models the dynamical interactions between stars, the formation and retention of compact objects and the large-scale evolution of the cluster mass and radius. We then compare the evolutionary data to an identical set of clusters formed with the standard Kroupa IMF to quantify the effect of the varying mass distribution. By analysing properties including black hole populations, cluster mass and radius over time, we investigate whether a bottom-light IMF produces properties of evolved GCs that differ significantly from those produced by a Kroupa IMF. The results of these simulations can be compared to current photometric observations to inform future work surrounding the IMF and help revise predictions for the rates of binary BH mergers originating in GCs.

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No

If you are selected for a poster, would you be interested in giving a short flash talk on your work?

Yes

What is your career level?

Undergraduate

Which keyword describes the area of focus of this talk?

Stars & stellar clusters

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