



Contribution ID: 138

Type: **Talk**

The ejection of hypervelocity stars from Milky Way globular clusters

Thursday, 22 August 2024 15:35 (20 minutes)

Discoveries of Milky Way stars with velocities in excess of the Galactic escape speed (~ 500 km/s at the Solar position) have been reported with increasing frequency in the era of large Galactic surveys. These 'hypervelocity stars' serve as a fascinating probe of the extreme dynamical and astrophysical phenomena which produce them, such as dynamical interactions with Sgr A* or supernovae within binaries. In this work we explore the possibility that three-body interactions between single stars and black hole binaries in dense Milky Way globular clusters eject stars well above the Galactic escape speed. Combining state-of-the-art cluster evolution simulations, dynamical interaction modelling, and mock observation techniques, we can predict the size and character of the globular cluster-ejected hypervelocity star population which is (in principle) detectable in current and future surveys. We find that a significant population of these objects should lurk in the current data release from the Gaia space mission, and yet more should become detectable in future Gaia data release(s) and in the upcoming LSST survey.

In this talk I will outline our modelling approach, describe in further detail this population of very fast stars, and offer insight on effective observational strategies for identifying them.

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Session Classification: Stellar multiplicity, exotica, and transients in star clusters

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