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The ones that got away: formation and evolution of intermediate-mass black holes in massive star clusters

Thursday, 22 August 2024 17:20 (20 minutes)

Repeated stellar collisions and hierarchical mergers in dense and massive star clusters are among the most straightforward mechanisms to produce intermediate-mass black holes (IMBHs).
In my talk, I will investigate the formation channels of IMBHs in globular clusters up to $10^6\,\mathrm{M}_\odot$. To do this, I will rely on an extensive set of accurate N-body models run with the recently-developed `PeTar` – `MOBSE`, which is uniquely conceived to integrate both stellar interactions and long-term dynamical evolution in massive and long-lived stellar clusters. I will show how the initial central densities and masses of the cluster affect the probability to form and retain an IMBH. Finally, I will discuss the peculiar impact of hierarchical mergers on the growth of IMBHs and the expected mass spectra of binary black hole mergers.

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