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

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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 $10^6 M_{\odot}$. 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.

Affiliation

Gran Sasso Science Institute

Current Position

PhD Student

Primary author: MESTICHELLI, Benedetta (Gran Sasso Science Institute)

Co-authors: Prof. MAPELLI, Michela (Institut für Theoretische Astrophysik - Universität Heidelberg); Dr RASTELLO, Sara (Institut de Ciències del Cosmos - Universitat de Barcelona)

Presenter: MESTICHELLI, Benedetta (Gran Sasso Science Institute)

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