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The Formation of Massive Black Holes in Dense Young Star Clusters

Baumgardt, Holger(理研)、牧野淳一郎(東京大学)、戎崎俊一(理研)

We report on N-body simulations of the formation of intermediate mass black holes in young star clusters and the subsequent dynamical evolution of star clusters containing massive black holes. Our simulations show that runaway merging of massive main-sequence stars can produce an intermediate mass blackhole in the M82 cluster MGG-11 if the initial concentration of this cluster is large enough. This could explain the detection of an ultra-luminous X-ray source in this cluster by Matsumoto et al. (2001). We will also show results of how star clusters with massive, central black holes evolve at later stages and discuss ways by which the black holes can be found.