

**BLACK HOLES IN DENSE STAR CLUSTERS**  
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TITLE: The Dynamical Evolution of Stellar Black Holes in Globular Clusters

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Massive globular clusters should form hundreds to thousands of stellar-mass black holes and retain most of them initially. Early theoretical arguments suggested that most black holes should be dynamically ejected within a few Gyr, implying that old globular clusters should have at most  $\sim 1$  black hole remaining at present. This prediction was, at the time, consistent with the lack of observational evidence for black holes in clusters. Recent detections of candidate stellar black holes in clusters, along with theoretical hints that at least some black holes can survive for many Gyr in clusters, both suggest that this topic is worthy of further theoretical study. I will describe the results of a Monte Carlo study aimed at investigating the long-term dynamical evolution of globular clusters containing large numbers of stellar black holes. We find that rapid mass segregation of black holes can drive gravothermal oscillations involving the most massive black holes, but it does not lead to a long-term physical separation of most black holes into a dynamically decoupled inner core, as often assumed previously. In almost all cases, we find that significant numbers of black holes (up to  $\sim 1000$ ) can be retained all the way to present.