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Stellar-Mass Black Holes in Globular Clusters MEAGAN MORSCHER, FREDERIC A. RASIO, Center for Interdisciplinary Exploration and Research in Astrophysics (CIERA) and Department of Physics and Astronomy, Northwestern University — Globular Clusters with core-collapse times longer that the lifetime of the most massive stars can avoid runaway growth of a very massive object, and can instead form many stellar-mass black holes (BH). The dynamical evolution of BHs in clusters is important for studies of merging BH-BH binaries, which are promising sources of gravitational radiation for future gravitational wave observatories. Since BHs are among the most massive objects in clusters, they tend to sink to the center through two-body relaxation, forming a dense core in which BH-BH binaries can be formed, destroyed, and ejected. The fate of BHs in clusters, however, is still highly uncertain. Only recently have dynamics codes become powerful enough to simulate clusters with realistic N, full stellar mass spectra, and significant numbers of primordial binaries. Using a Monte Carlo method, we model realistic star clusters with stellar-mass BHs. We discuss the evolution of BH populations within clusters, as well as the implications for gravitational wave astronomy.

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