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Stellar Dynamical Pathways to Coincident Gravitational Wave and Electromagnetic Transients from Intermediate Mass Black Holes in Dense Stellar Systems

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When they are embedded in dense star clusters, intermediate-mass black holes acquire close stellar and compact object companions. Over time, these pairings are subject to dynamical exchanges, continuous fly-by gravitational interactions, and secular dynamical torques. These processes tend to scatter systems into the phase space where they undergo strong gravitational wave emission or tidal stripping of a stellar object. Because of the diversity of stellar types and dynamical processes at play, we expect a range of different signatures in the gravitational wave and electromagnetic domains. This talk will review how the dynamical processes that assemble these sources offer us crucial clues about the nature of their possible coincident electromagnetic and gravitational wave signatures.