BLACK HOLES IN DENSE STAR CLUSTERS
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TITLE: Rates of Stellar Tidal Disruption: Theory versus Observation

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Rates of stellar tidal disruption by supermassive black holes (SMBHs) due to two-body relaxation are calculated using a large galaxy sample ($N \sim 200$) in order to explore the sensitivity of the tidal disruption event (TDE) rates to observational uncertainties, such as the parameterization of galaxy light profiles and the stellar mass function. The largest uncertainty is the poorly constrained occupation fraction of SMBHs in low-mass galaxies, which otherwise dominate the total TDE rate. We calculate detection rates of TDE flares by optical surveys as a function of SMBH mass and other observables for several physically motivated models of TDE emission. If most detected events are characterized by super-Eddington luminosities (such as disk winds, or synchrotron radiation from an off-axis relativistic jet), then the measured SMBH mass distribution will tightly constrain the low-end SMBH occupation fraction. If Eddington-limited emission channels dominate, however, then the occupation fraction sensitivity is much weaker for flux-limited surveys (although still present in volume-complete samples). The SMBH mass distribution in the current TDE sample, though highly inhomogeneous and fraught by selection effects, already hints that either Eddington-limited emission channels dominate. Even conservative assumptions produce theoretical TDE rates at least an order of magnitude above observationally inferred ones; we speculate that this could be due to either (i) a pronounced bimodality in optical emission mechanisms, or (ii) strong tangential velocity anisotropies in galactic nuclei. The talk will begin with a general introduction to the subject of TDEs.