

Galaxy merger rates

How many binary BHs from galaxy mergers?

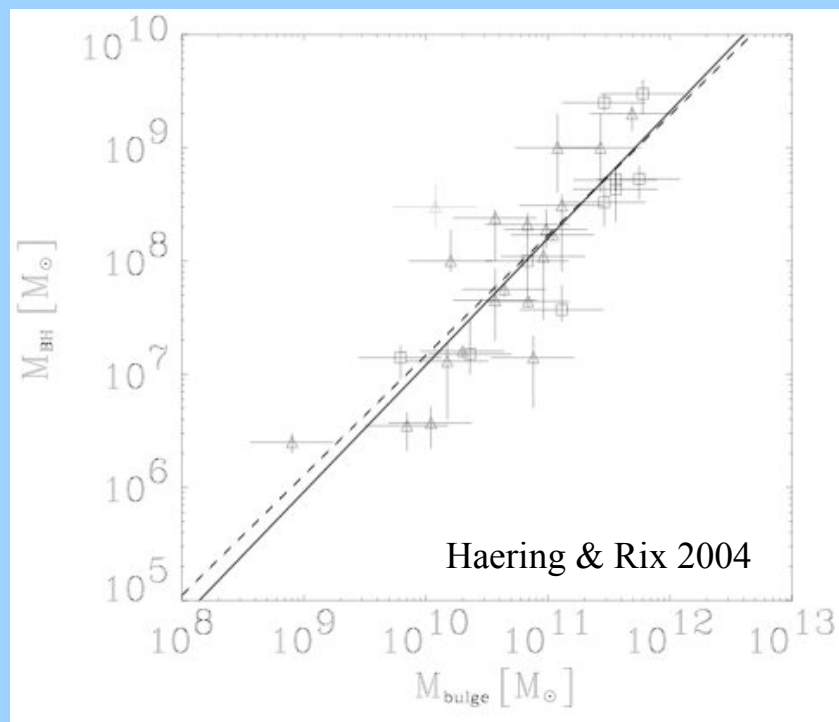
Black-hole mass function Φ (BH mass, z)

+ Galaxy merger rate f (galaxy mass, z)

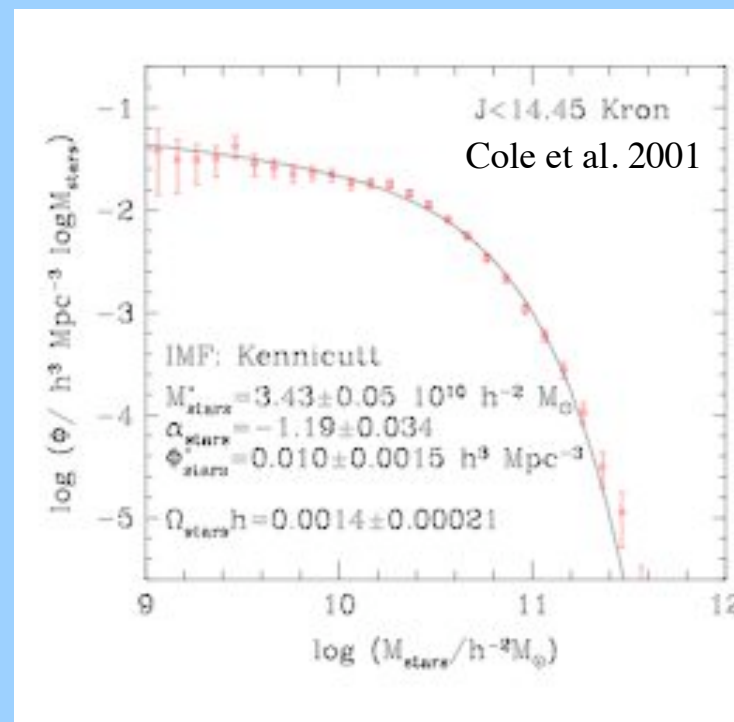
=> Predicted black-hole merger rate (z , BH mass)

[BH mass ~ 0.002 x Galaxy stellar mass]

Black-hole mass function



Bulge mass - BH mass relation ($z \sim 0$)



Stellar Mass Function ($z \sim 0$)

Black holes can grow in mass either by mergers or by gas accretion (e.g. in a QSO/AGN phase)

Galaxy merger rates?

- Many possible ways of estimating merger rates, either from observations or from n-body models.
- For PTA, mainly interested in $M_{\text{BH}} > 10^8 M_{\text{sun}}$, redshift $z < 2$ and mergers of near-equal M_{BH} black holes.

i.e. luminous elliptical (LRG) or disk galaxies, not dwarfs

<i>Merger</i>	<i>Observe</i>
LRG-LRG	Stellar mass growth, changes in stellar population, isophote distortions?
LRG-disk	Bulges with HI, dust disks, star formation, AGN?
Disk-disk	Massive starburst, AGN?