Can intermediate mass black holes (IMBHs) form by mergers in globular clusters?

\[ M_{IMBH} \sim 10^2 - 10^4 \, M_\odot \]

Are ultraluminous X-ray sources (ULXs) powered by IMBHs?

\[ L_x \sim 10^{40} \, \text{ergs}^{-1} \sim L_{Edd}(10^2 M_\odot) \]

if isotropic

\[ \text{X-ray luminosity function of nearby galaxies normalized by star formation rate (Grimm et al., 2002)} \]

- Most ULXs are XRBs — anisotropic emission

- Of GR 1915 + 105:

\[ M_{BH} \sim 13 M_\odot, \quad L_x^{\text{isotropic}} = 7 \times 10^{39} \, \text{ergs}^{-1} \]

\[ = 4 L_{Edd}^{\text{ul}} \]
BH mergers in GCs?

gravitation
Wave emission
(quadrupole - octupole)

$V_{kick} \sim V_{orb}$ (last stable orbit)

$\Rightarrow$ Vescope in many cases