

Gravitational waves across frequencies

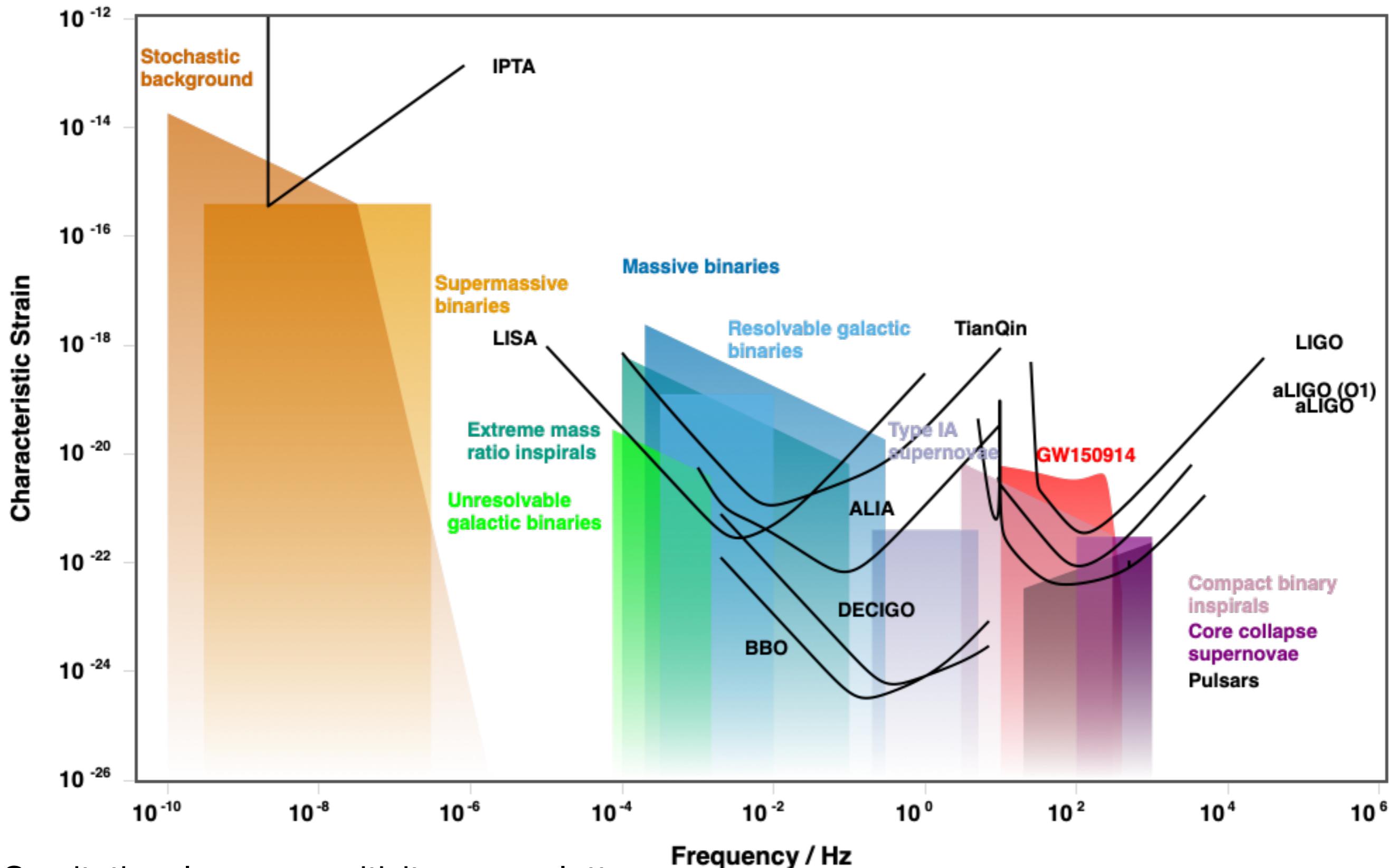
Alberto Vecchio

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Birmingham - 28 October 2019



UNIVERSITY OF
BIRMINGHAM

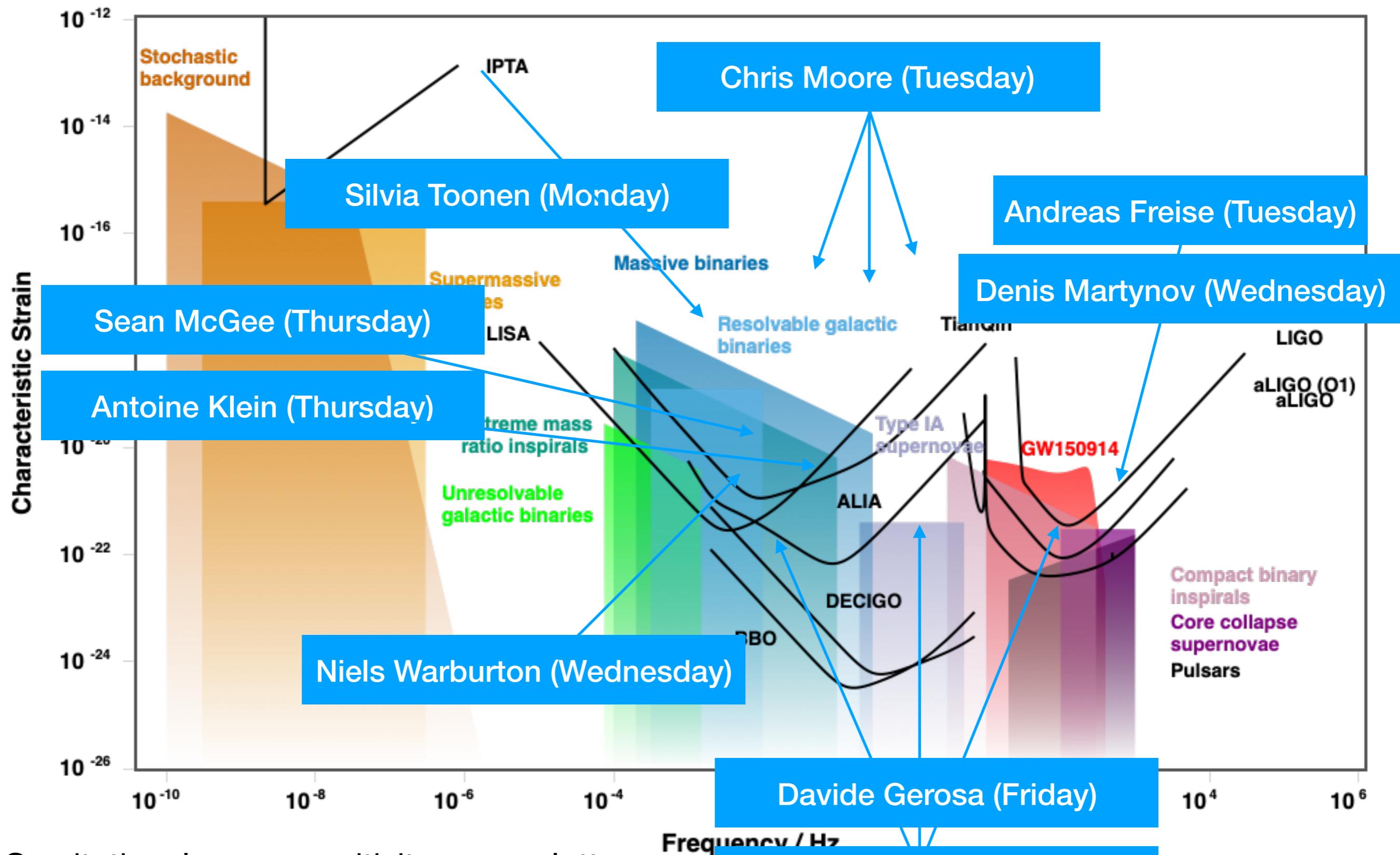
GRAVITATIONAL
WAVE ASTRONOMY



Gravitational wave sensitivity curve plotter

<http://gwplotter.com>

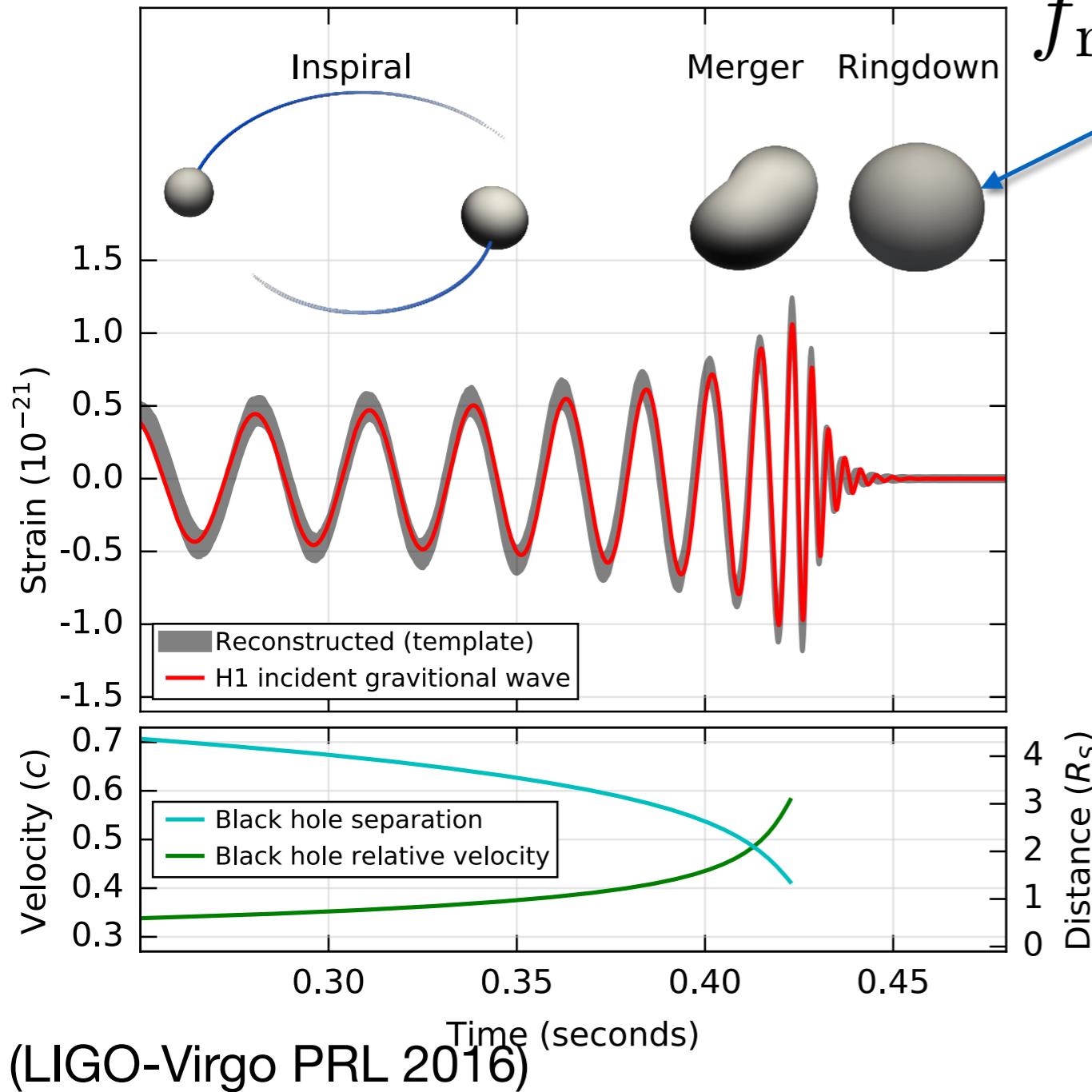
Moore et al arXiv:1408.0740 (CQG 2015)



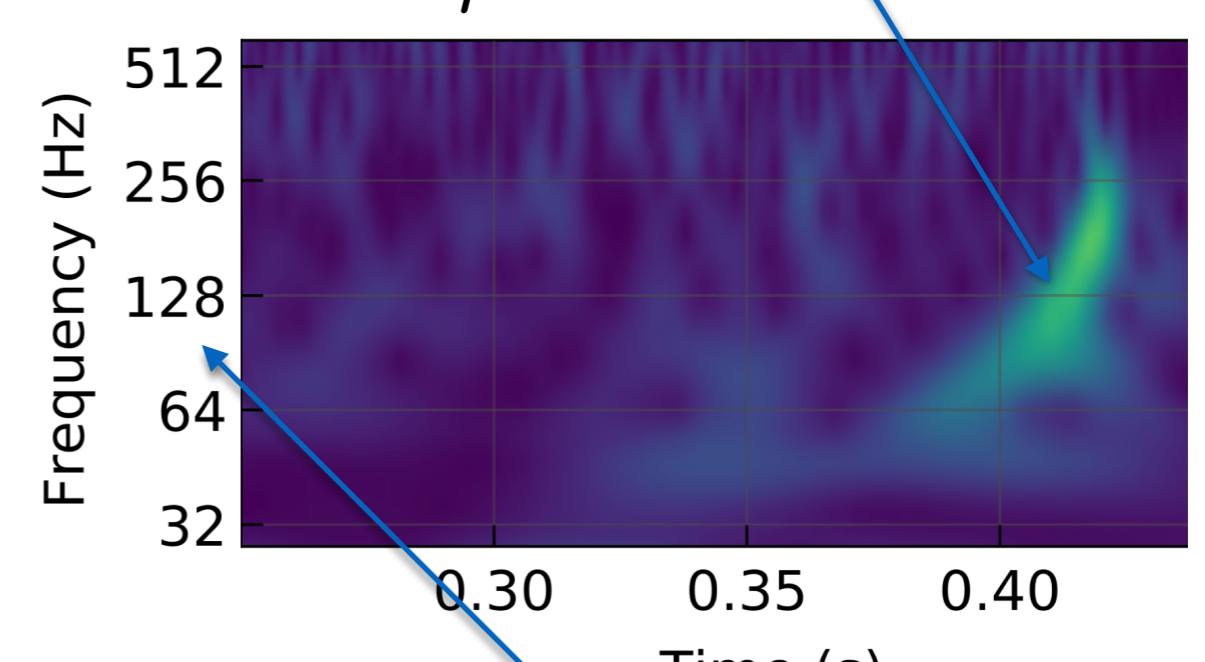
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Gravitational waves from binary systems

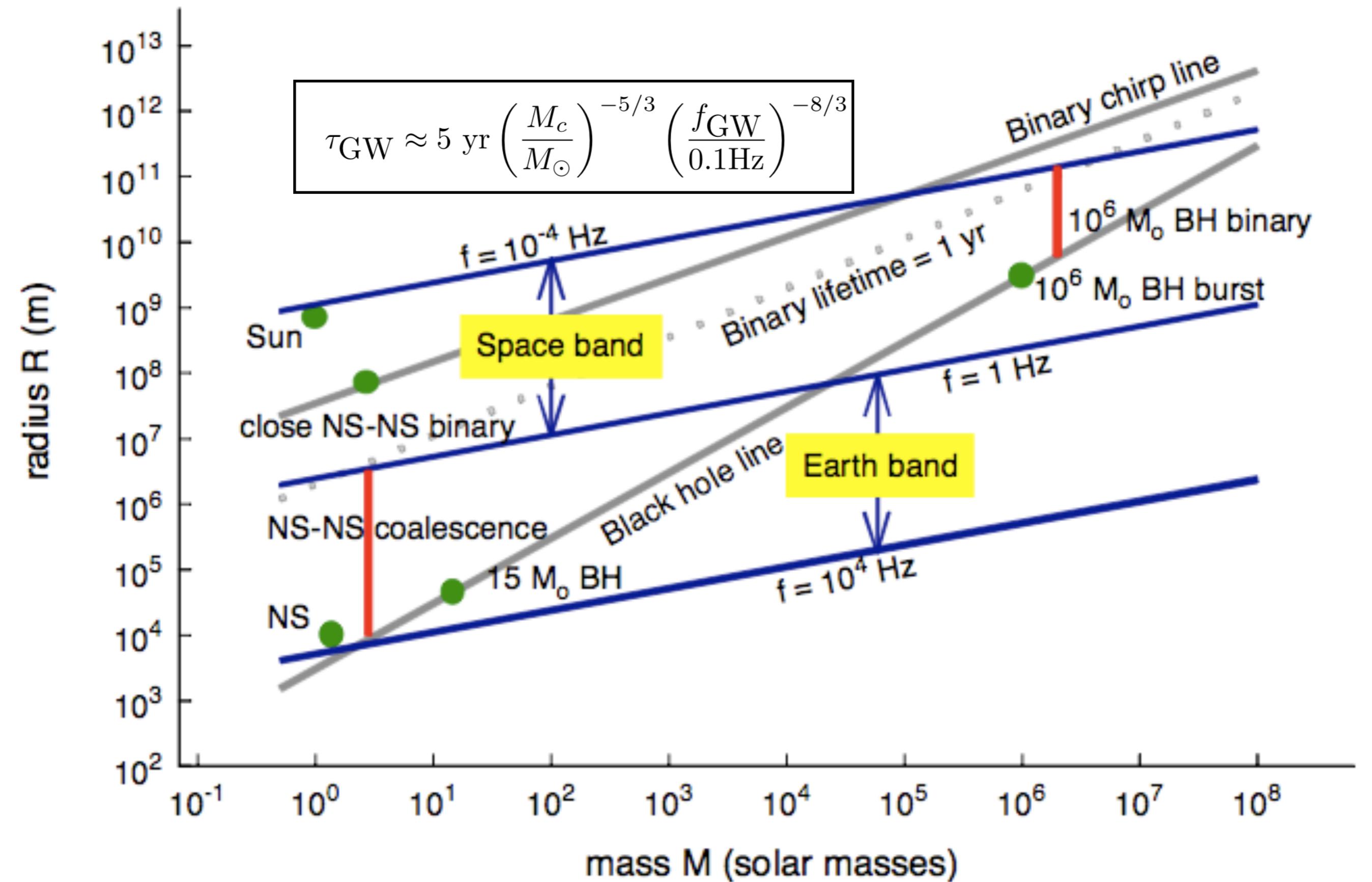


$$f_{\text{rd}} = \frac{1}{2\pi M} \quad df/dt \sim \mathcal{M}^{5/3} f^{11/3}$$
$$\mathcal{M} = M\eta^{3/5}$$



$$(\pi f)^2 = M/a^3$$

$1M_\odot \simeq 5 \times 10^{-6}$ sec

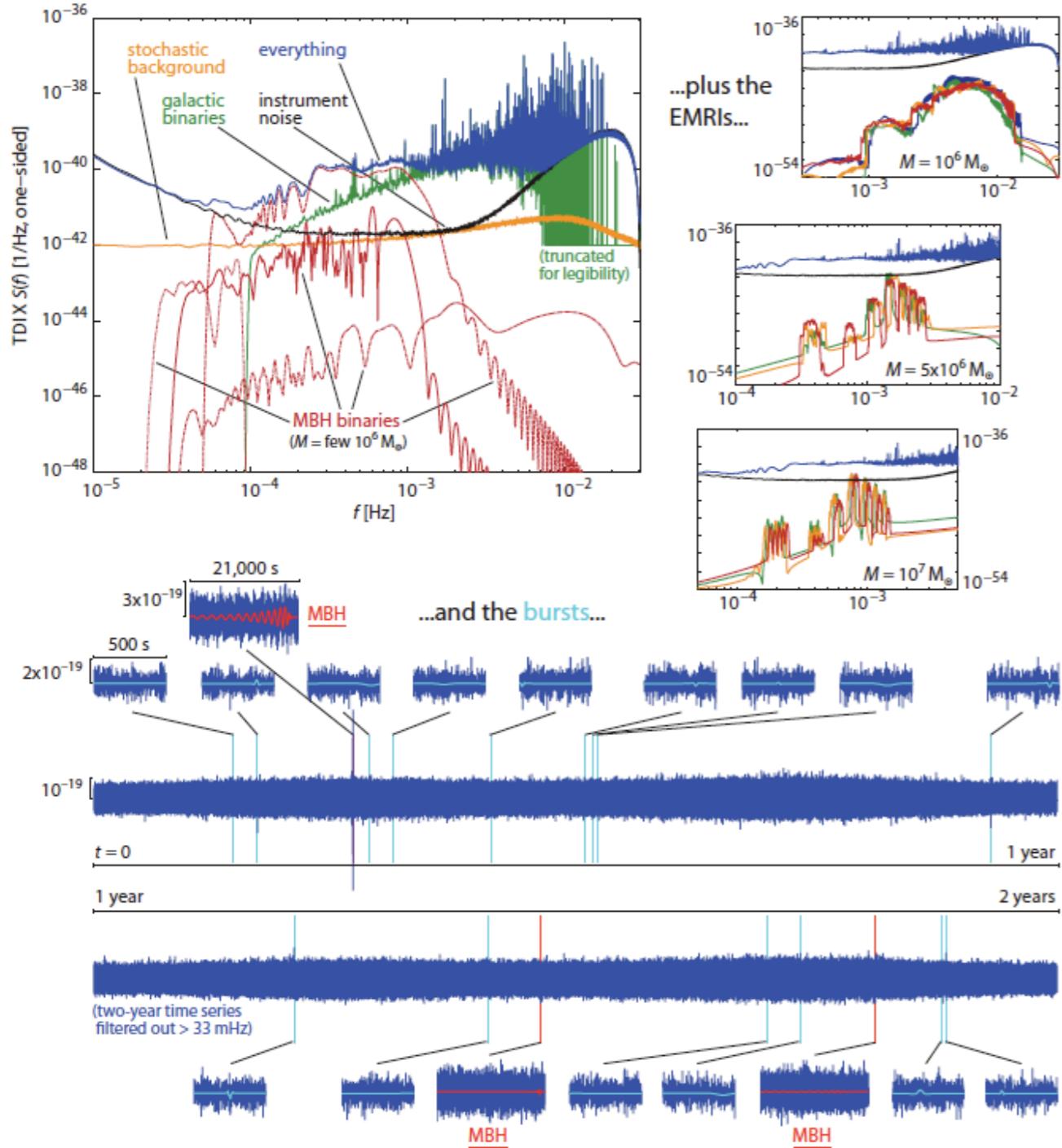


(credit B. Schutz)

Space-based instruments

MLDC4, training dataset

2 years of instrument noise, 60 million Galactic binaries, 4 MBH binaries, 9 EMRIs, 15 cosmic-string bursts, cosmological stochastic background



Ground-based instruments

