

The nature of DM: Cosmology

SEA Synergies Dark Matter Colloquium, 23rd Sep 2021

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Inflationary Predictions

BIG BANG

Inflation

380,000 years
after Big Bang

Quantum Fluctuations

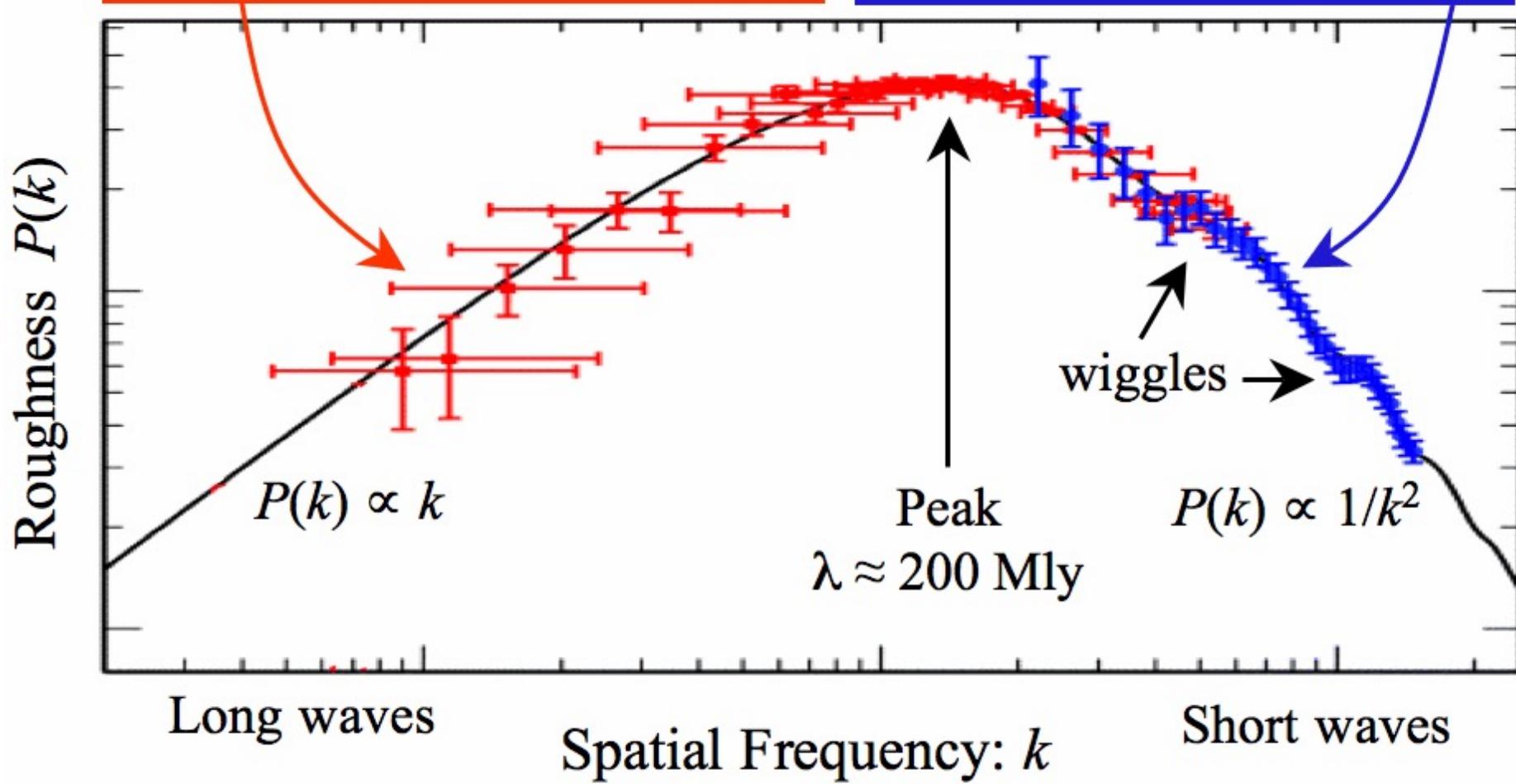
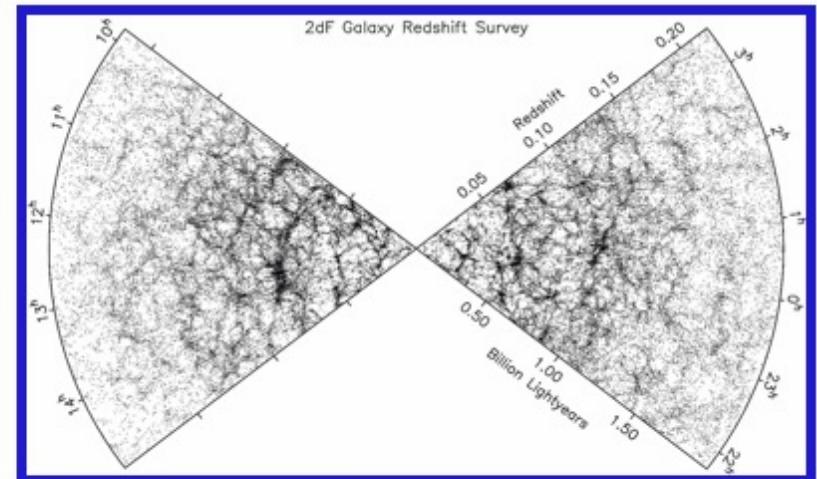
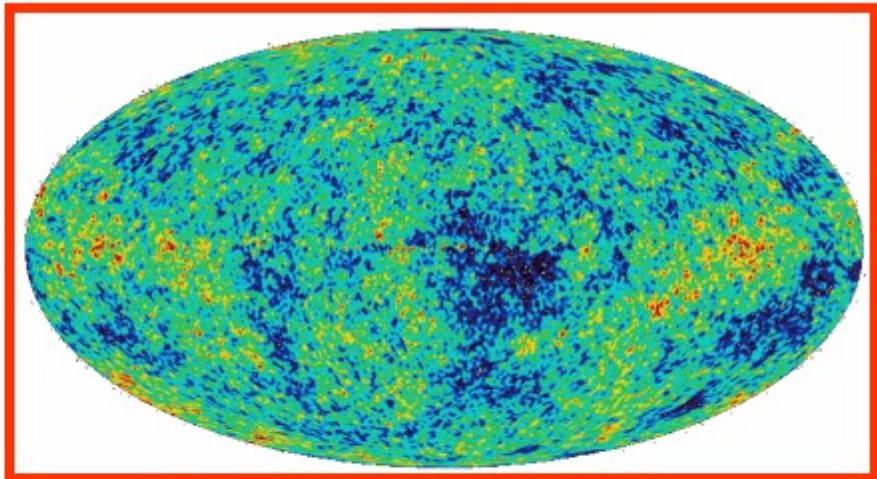
CMB Anisotropies

photons

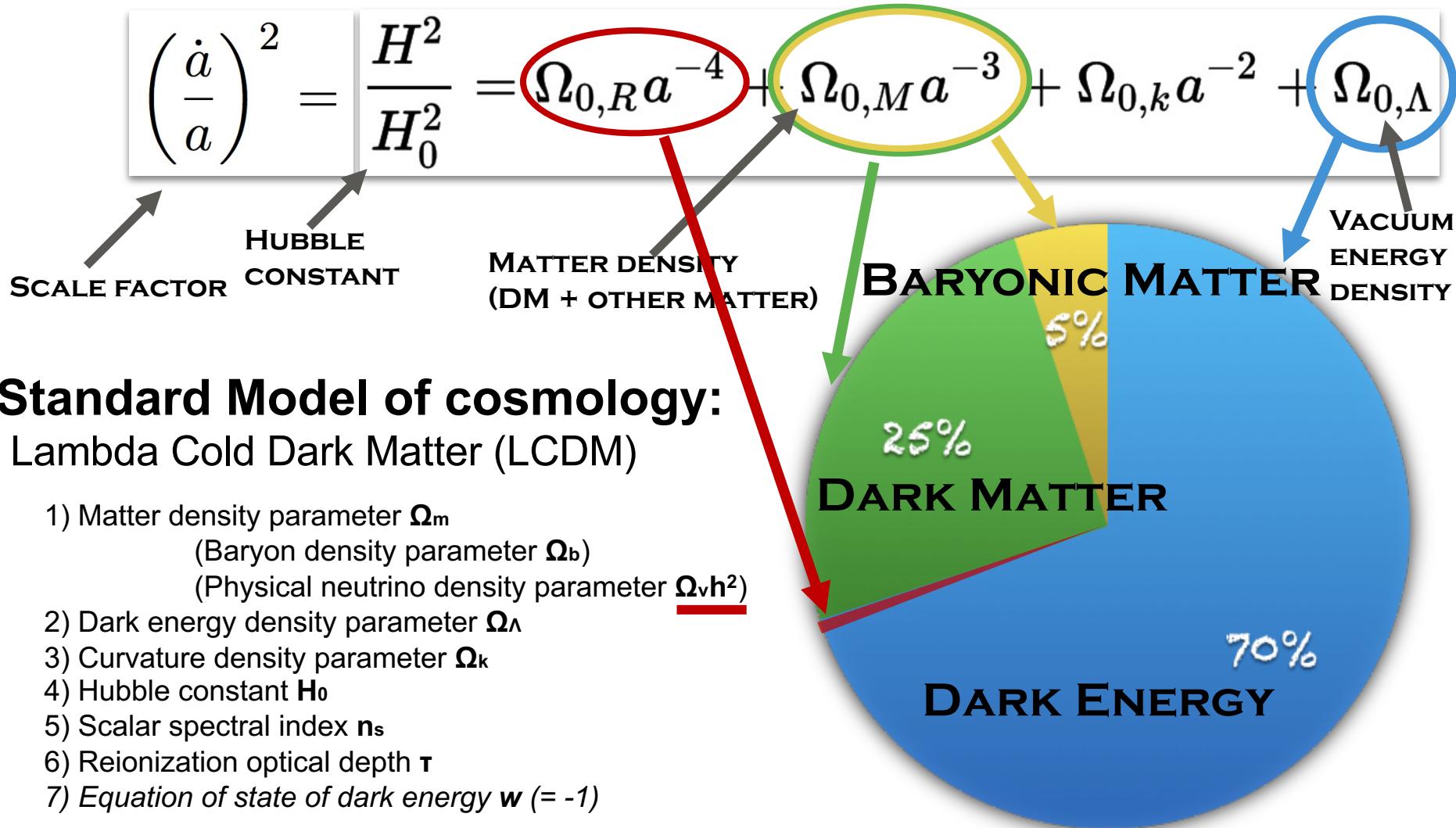
Gravitational waves

13,800 million years
after the Big Bang

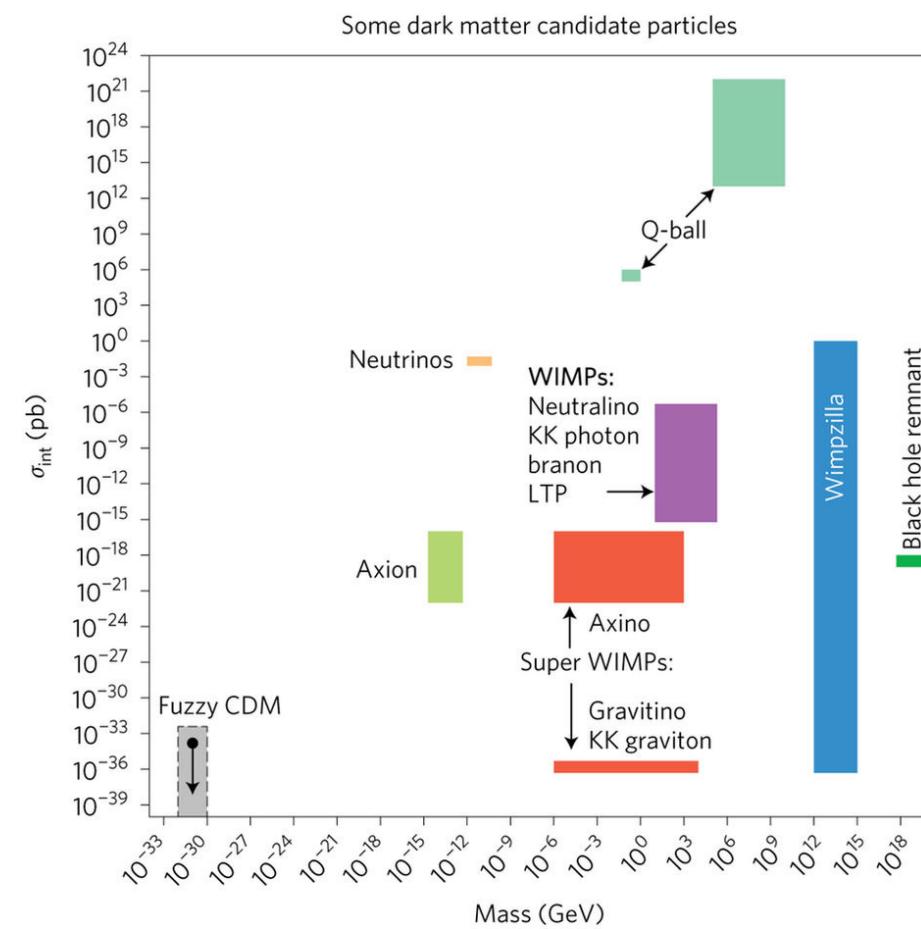
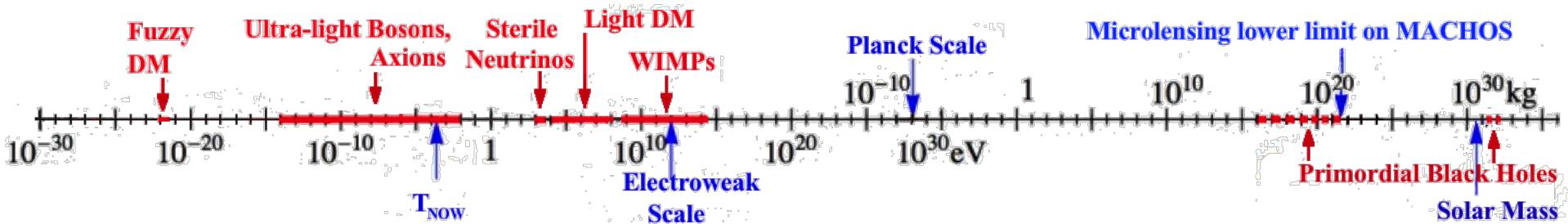
Structure
Formation



On large scales, the Universe is described as a homogenous fluid in an expanding space

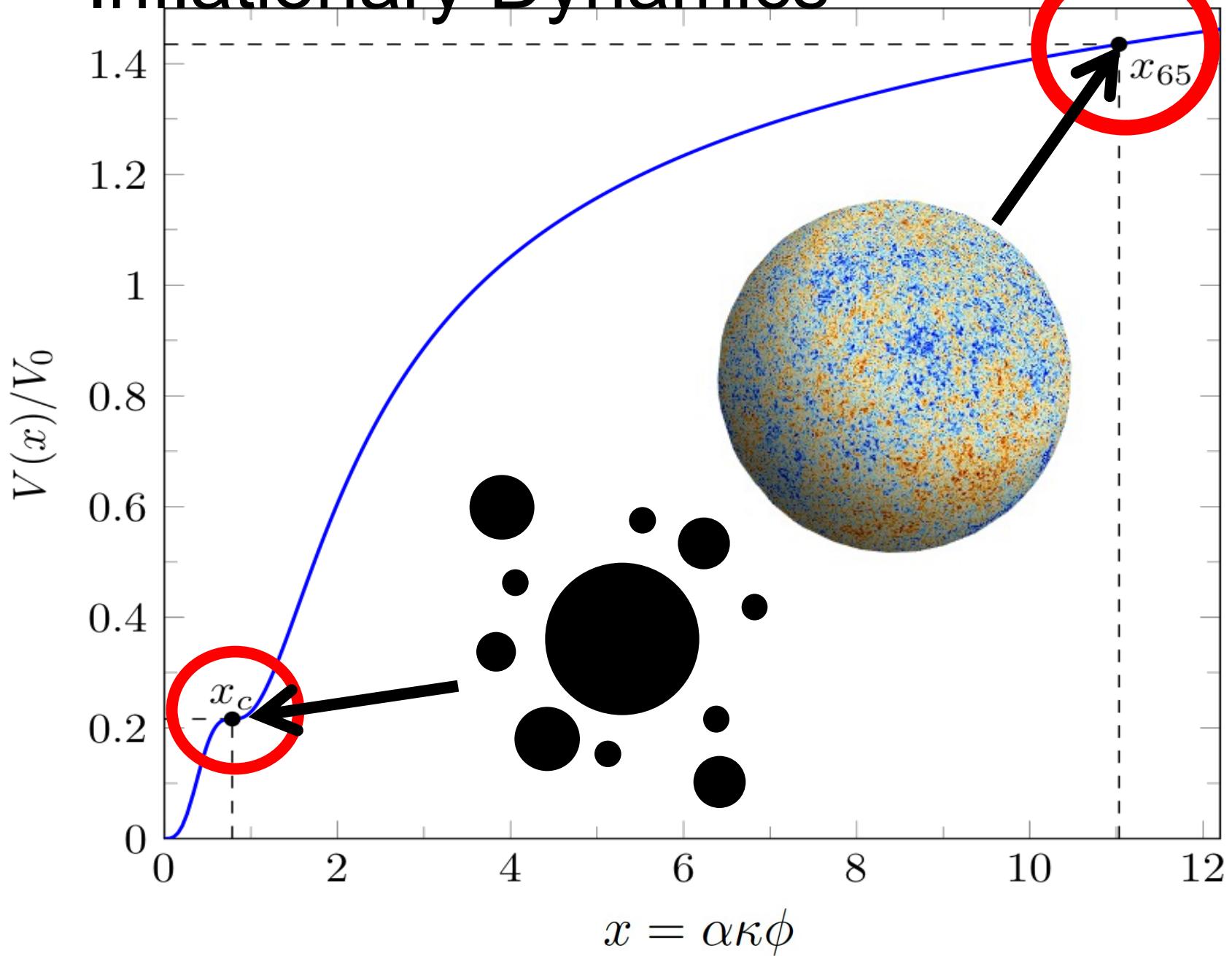


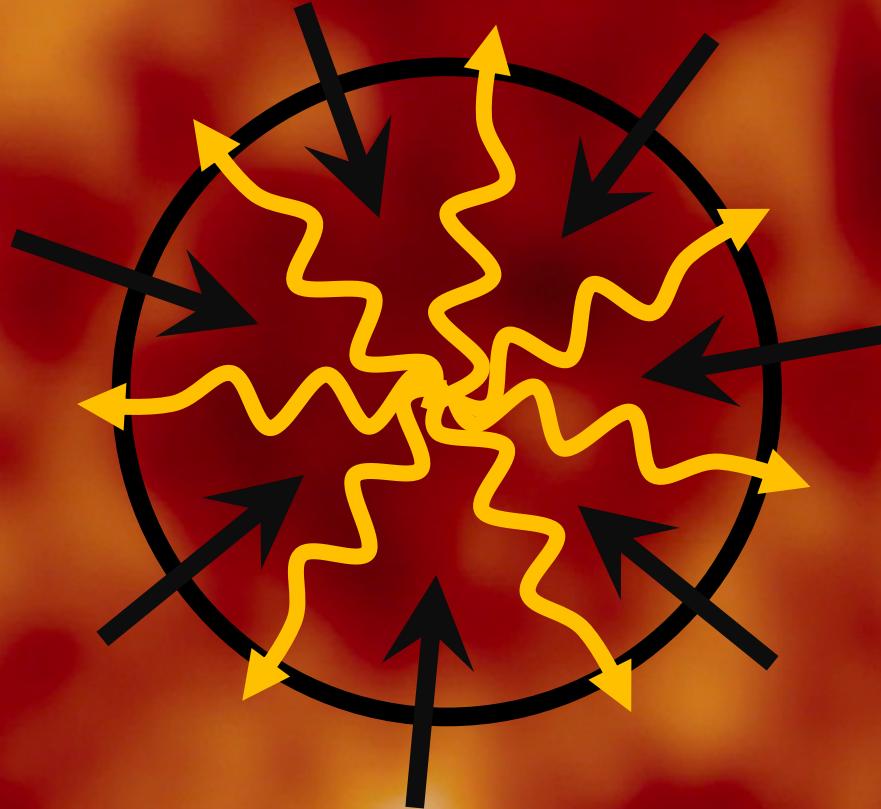
90 orders of magnitude in mass



60 orders
of magnitude
in cross-section

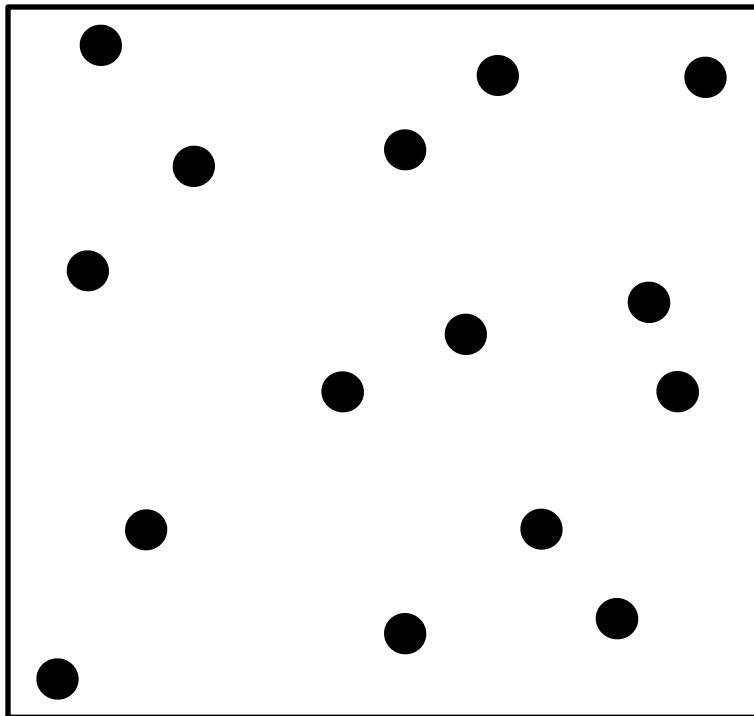
Inflationary Dynamics



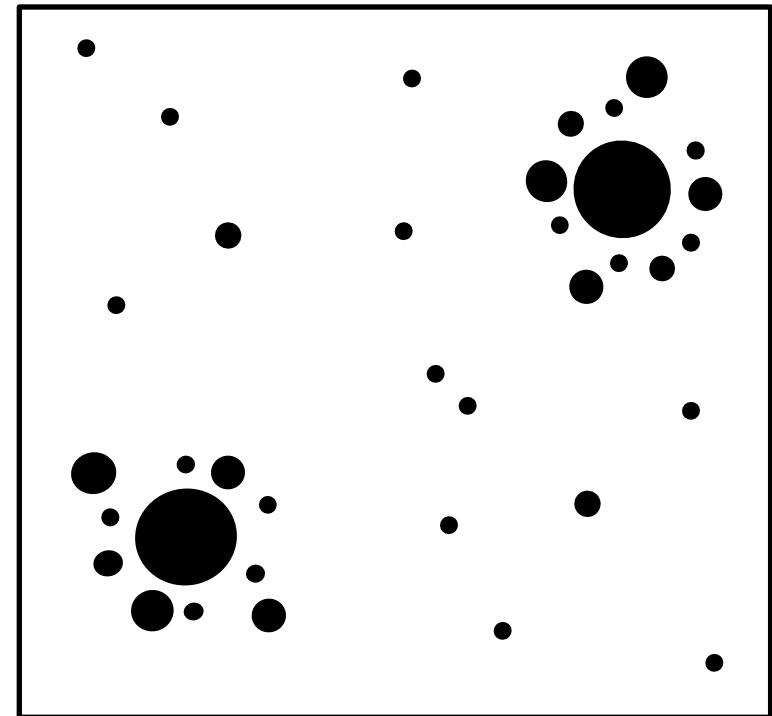


Primordial plasma

Spatial Distribution PBH



- Monochromatic
- Uniformly distributed

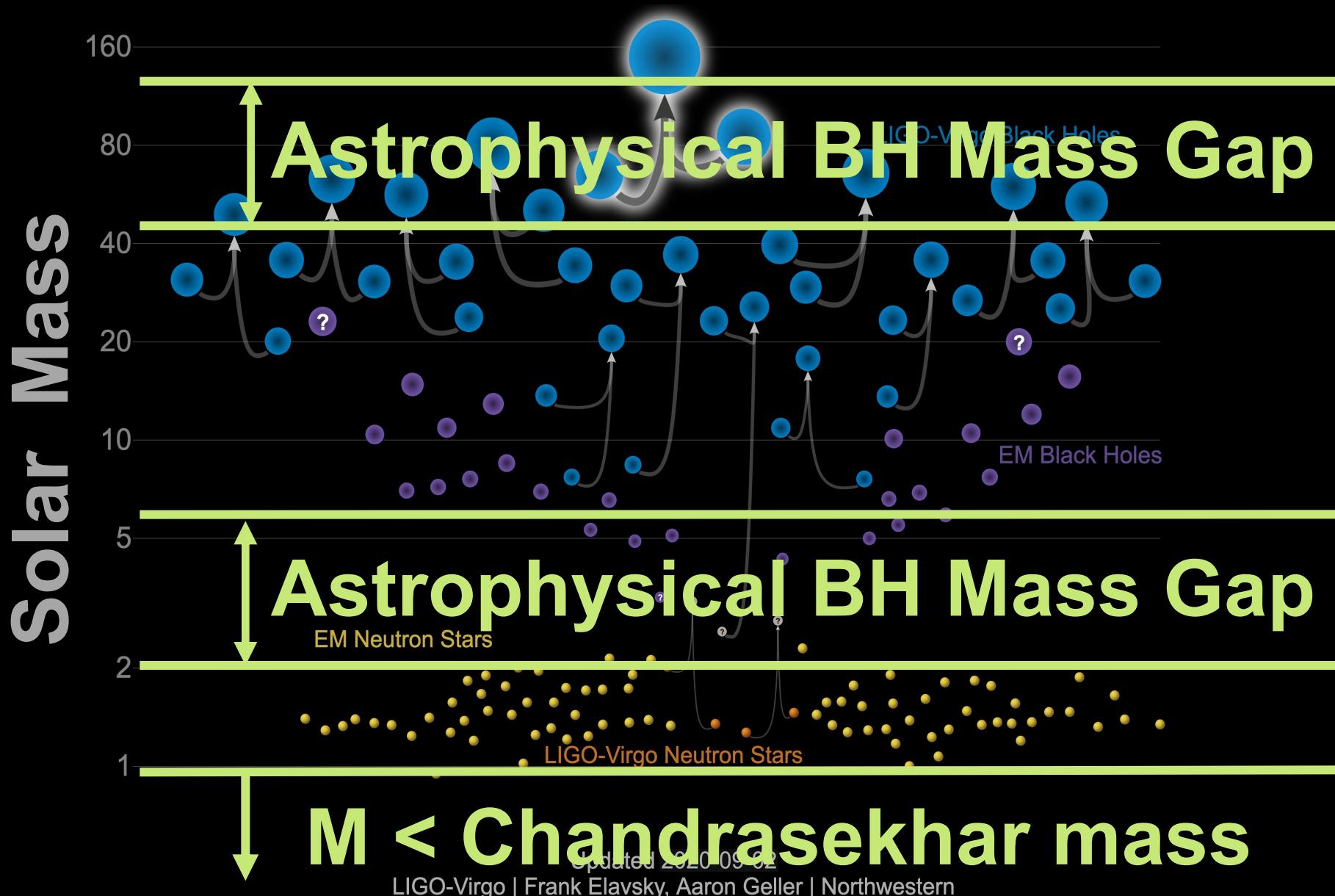


- Broad range of masses
- PBH in clusters

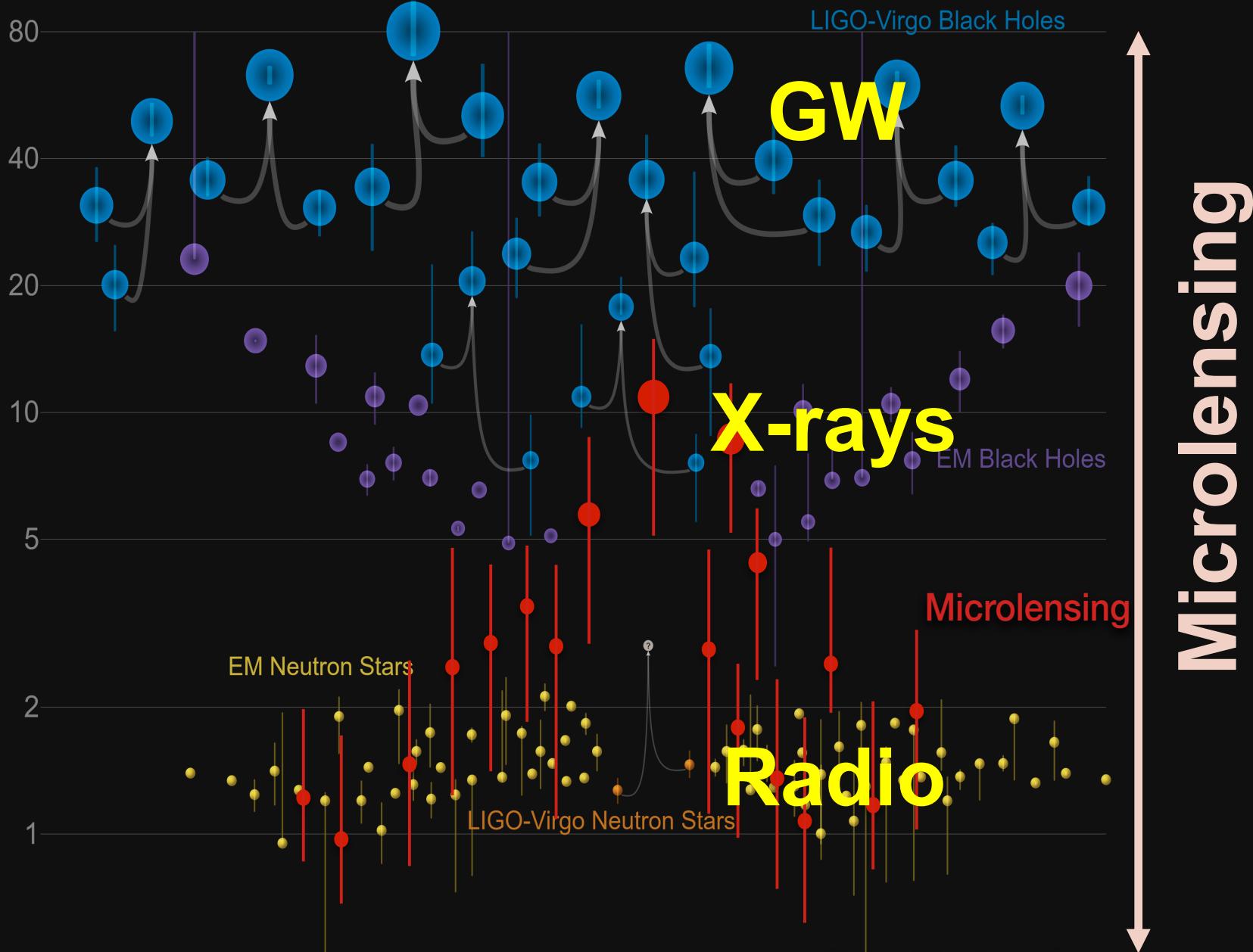
JGB (2017)



Black Holes and Neutron Stars

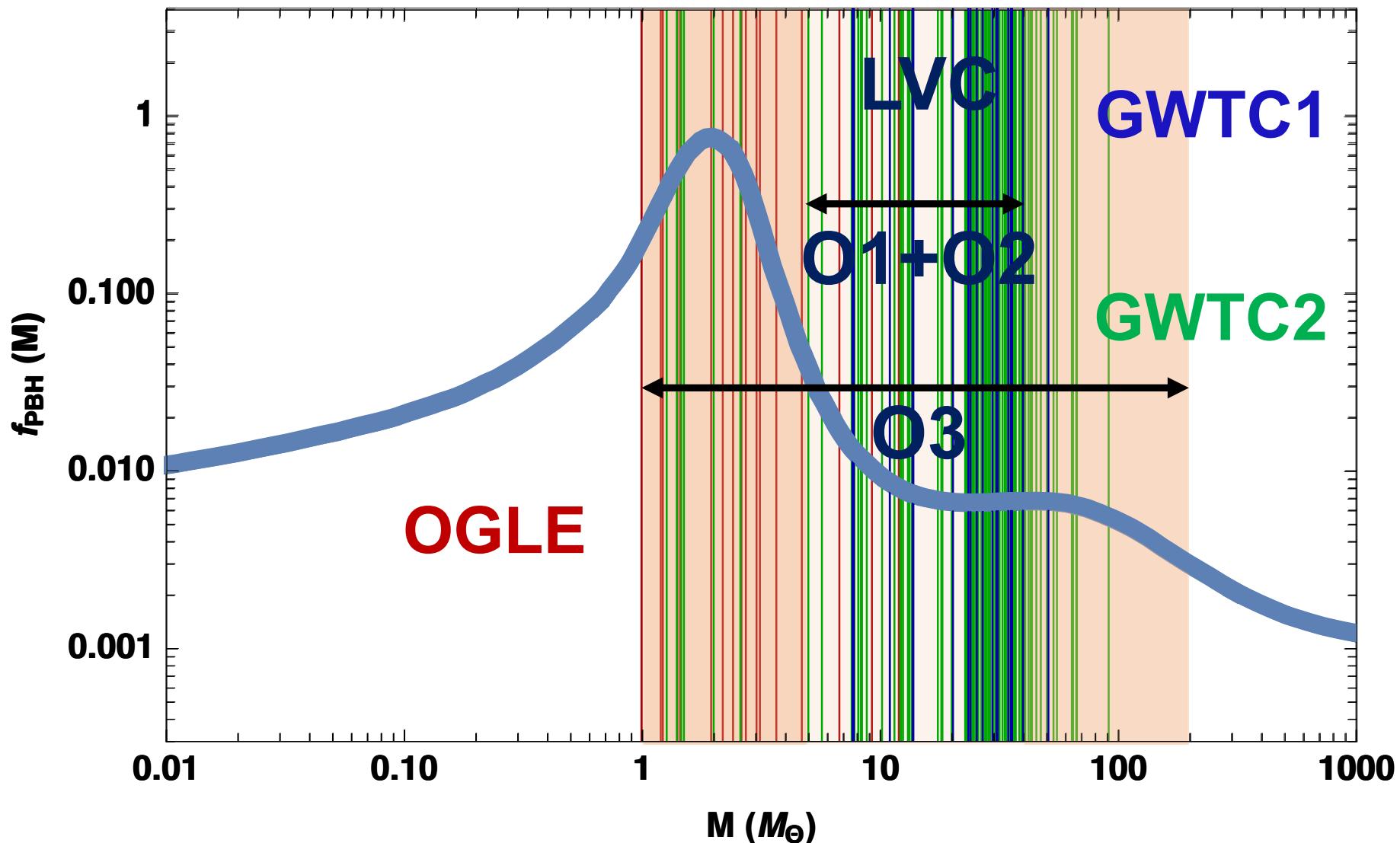


Black Holes and Neutron Stars



Model prediction: mass spectrum

JGB, Clesse (2020)



The future of GW (G3)

Detection horizon for black-hole binaries

