

# A few notes on the public GW data

Tomek Bulik  
Neha Singh

# What do we get from GraceDB?

- Classification
- Distance
- Skymap
- False alarm rate

# What does it imply?

$$\delta < \rho = \delta \frac{r_o}{D_L} \left( \frac{\mathcal{M}_z}{1.2M_\odot} \right)^{5/6} \times \Theta(RA, Dec, \Psi, i) \times \xi(f_{max})$$

$$r_o \Theta \rightarrow r_o \Theta_{eff} = \sqrt{r_L^2 \Theta_L^2 + r_H^2 \Theta_H^2 + r_V^2 \Theta_V^2}$$

Assume equal to 1.

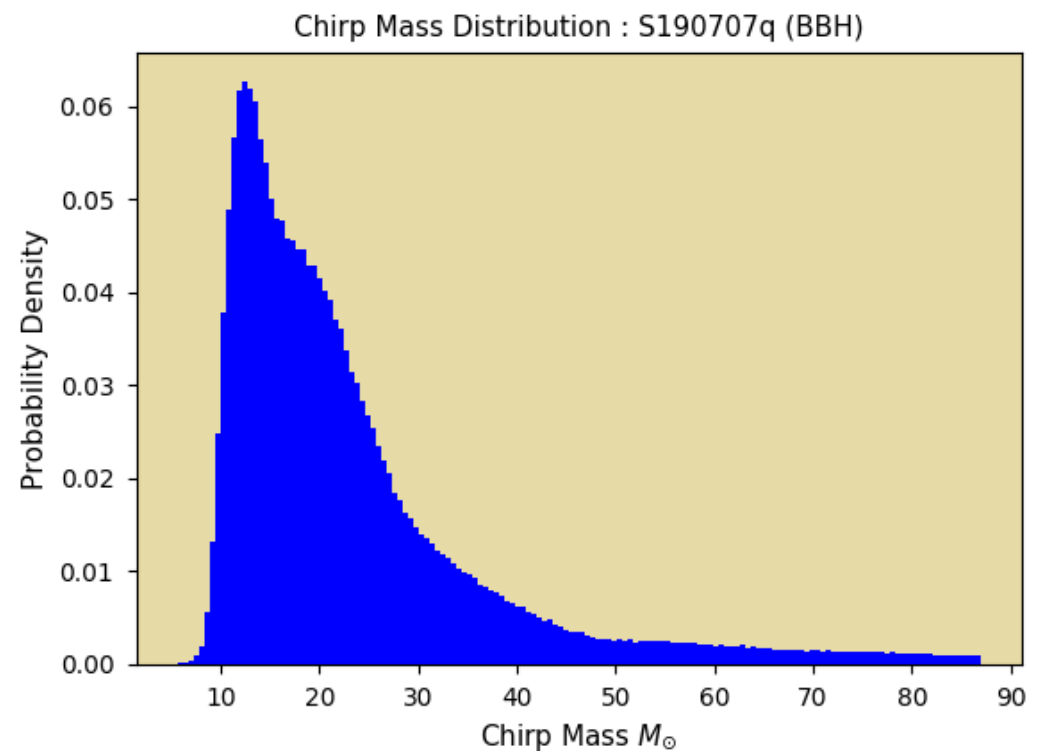
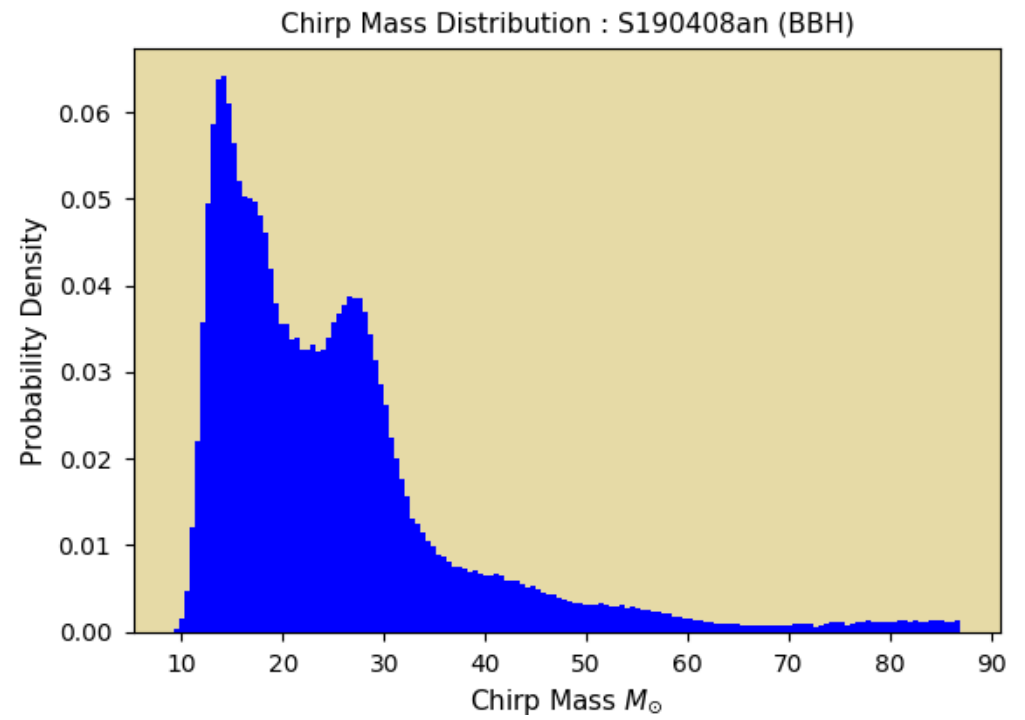
# Implications for chirp mass

## ● Source classification:

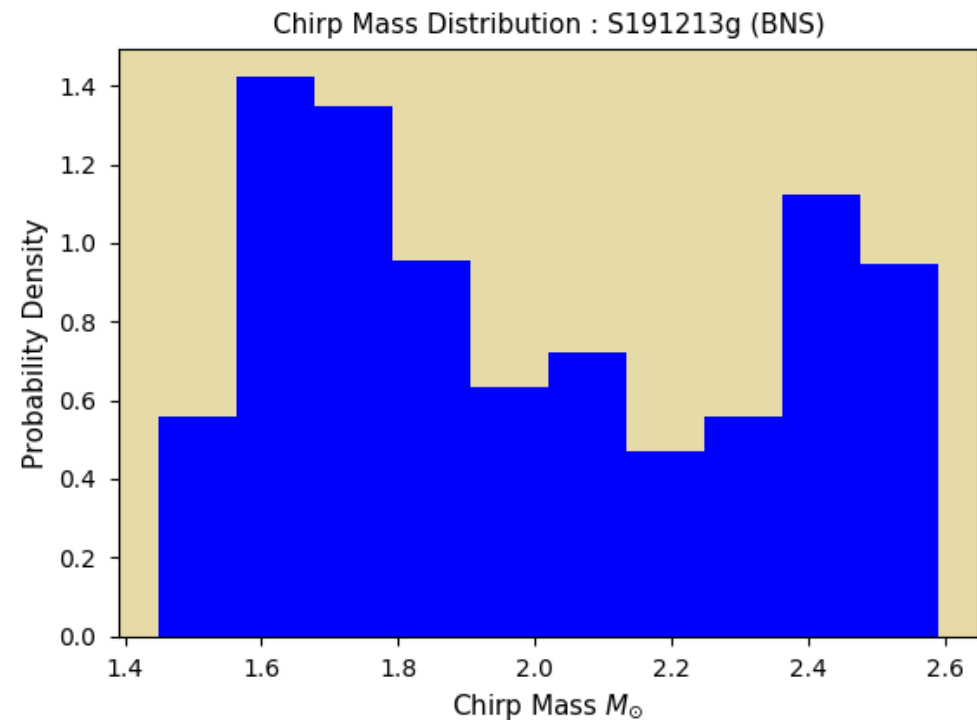
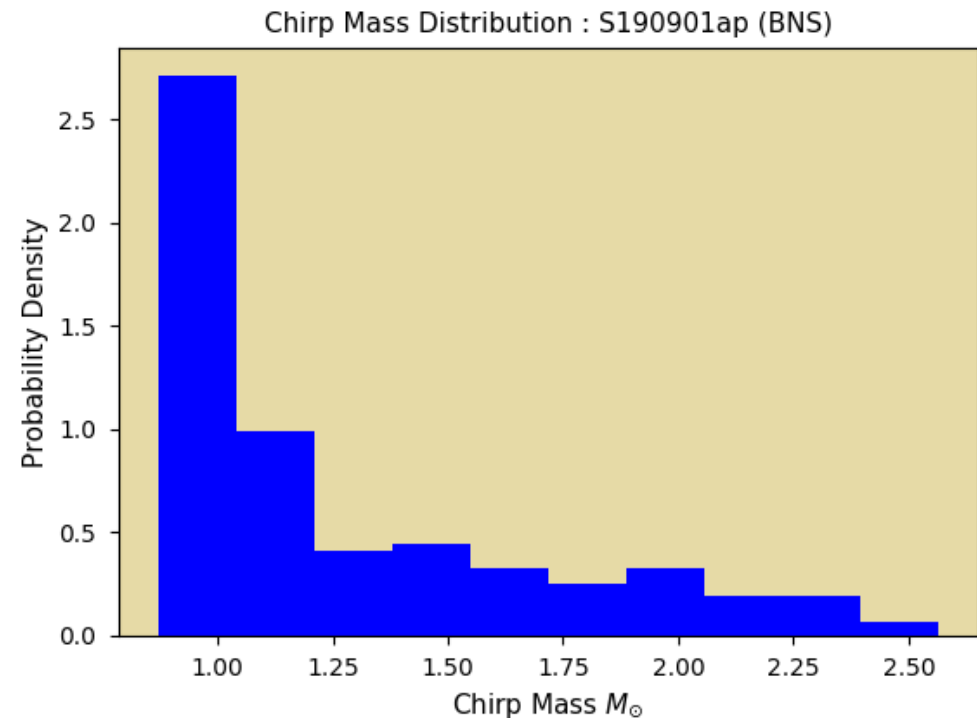
- NS: 1-3 solar masses
- Mass Gap: 3-5 solar masses
- BH: above 5 but ...

$$\mathcal{M}_z > 1.2M_{\odot} \left( \frac{D_l}{r_o \Theta_{eff}} \right)^{6/5}$$

# BBH

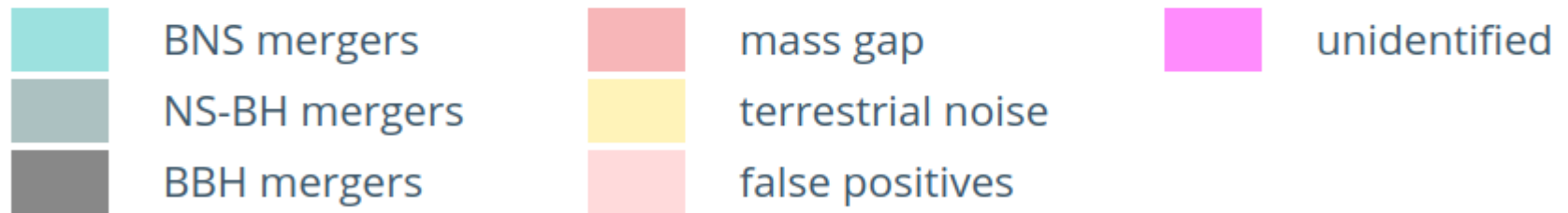
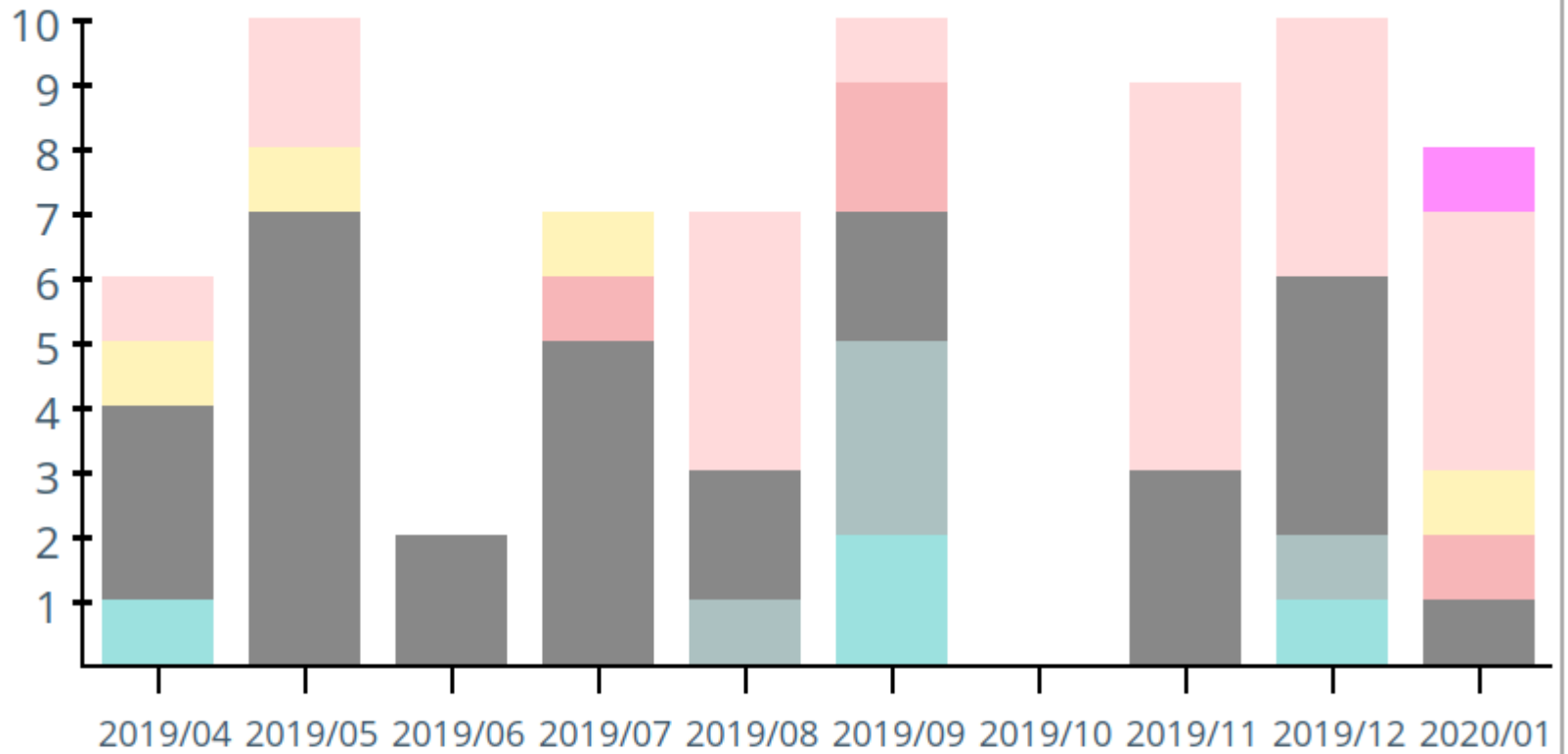


# BNS



# Summary of observations

### Superevent detections from O3





### O3 detections by distance

