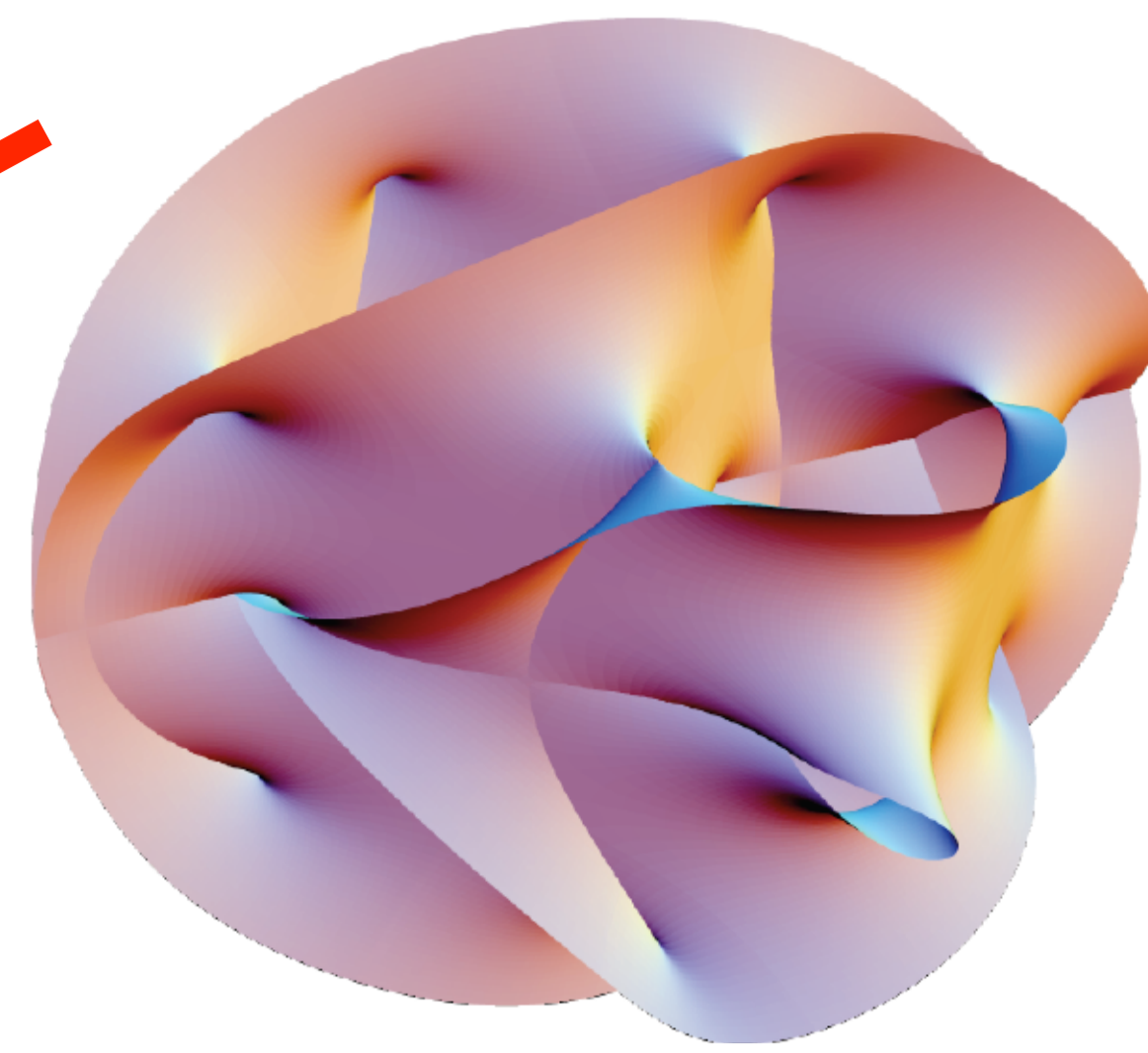


# Black Holes as Probes of the String Axiverse



Extra dimensions + Rich Topology + Gauge Fields

STRING MULTIVERSE:  
LANDSCAPE of  $\sim 10^{500}$  VACUA



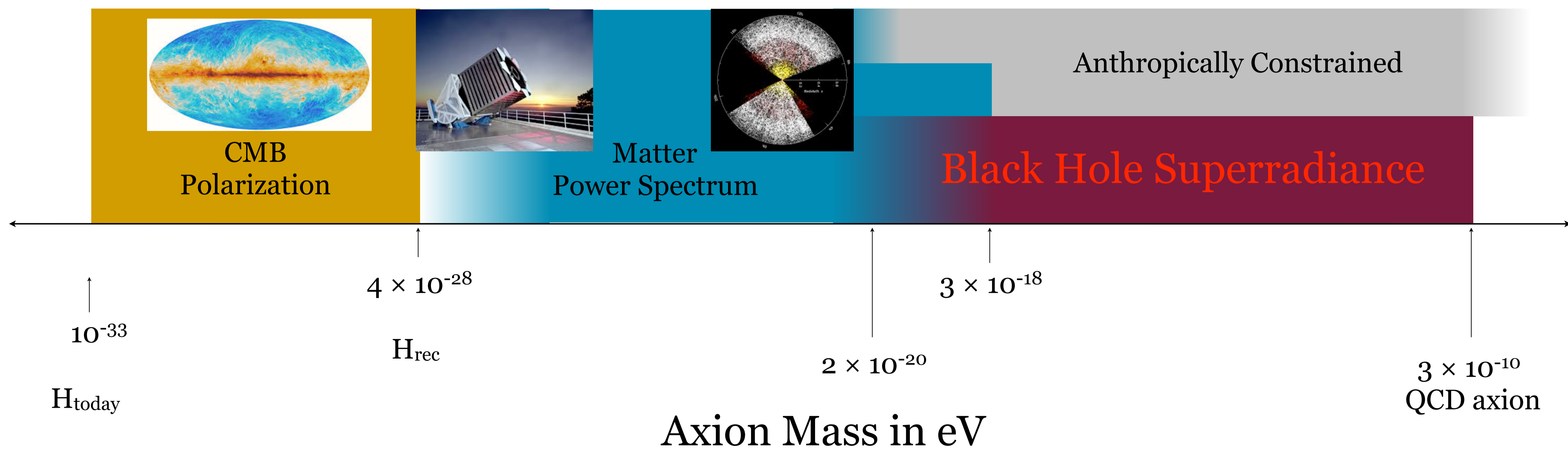
STRING AXIVERSE:  
PLENITUDE of AXIONS in OUR VACUUM



Testing Multiverse through Axiverse



AXIONS: PSEUDOSCALAR VERY WEAKLY INTERACTING PARTICLES  
OBSERVATIONAL PROBES:



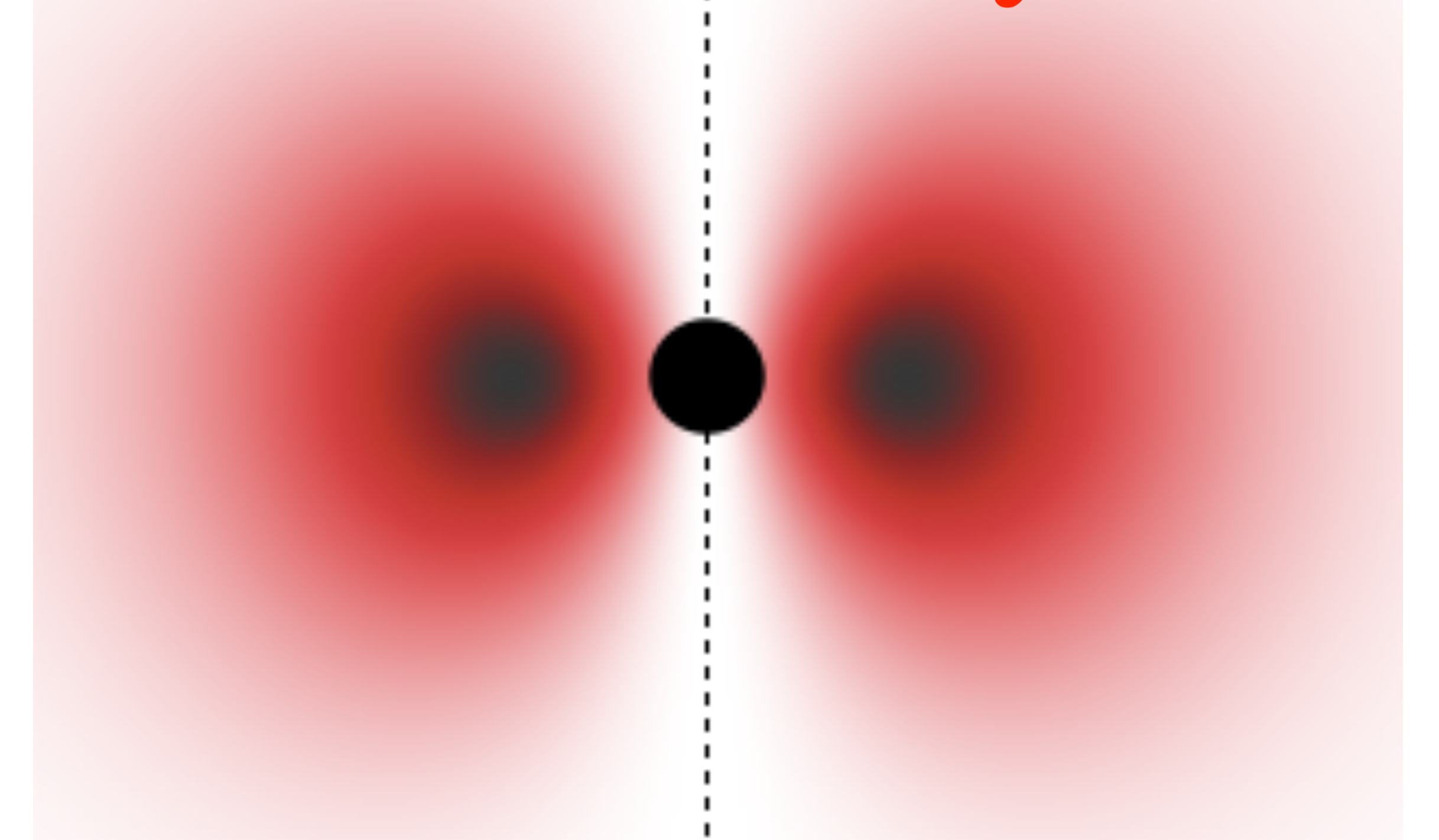
**Black Hole Superradiance:**

Instability of Rotating Black Holes Caused by Axions

Rotating Black Hole



Gravitational Atom  
in the Sky



“Atomic” Transitions  
may be observed by gravity wave detectors



Advanced LIGO

