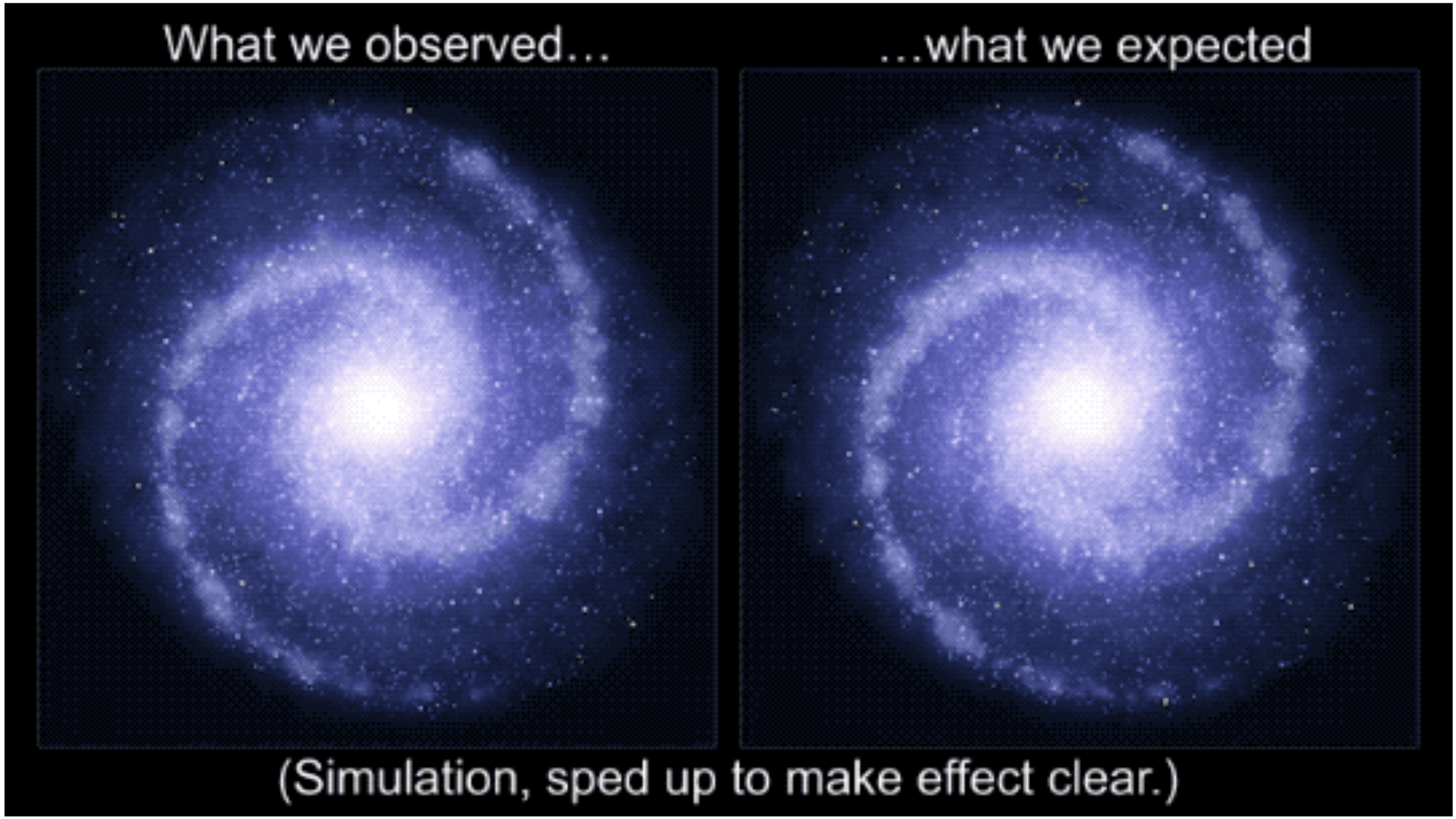
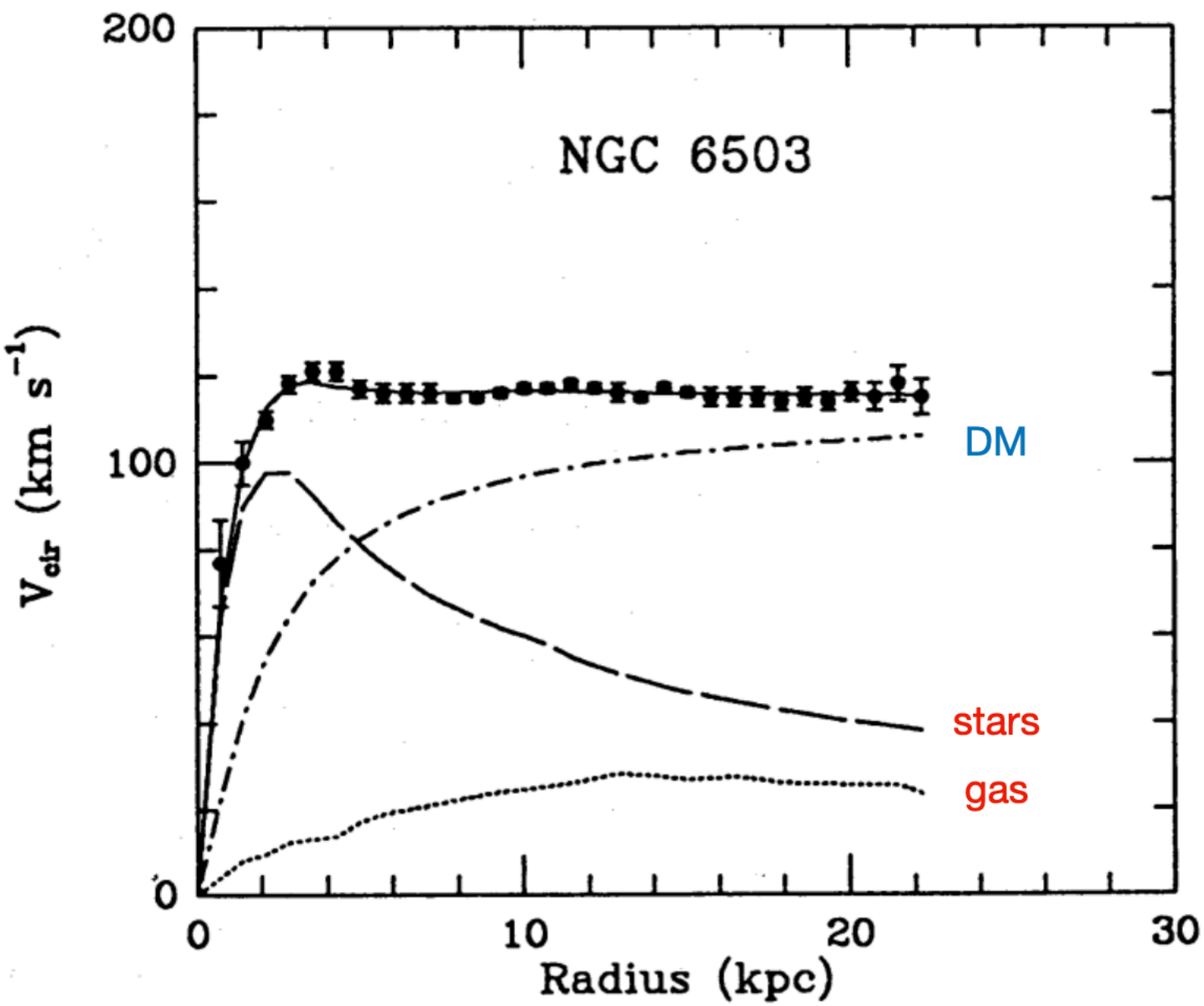
Rotation Curves



Source: NASA

https://commons.wikimedia.org/wiki/File:Galaxy_rotation_under_the_influence_of_dark_matter.ogv

Rotation Curves



Begeman et al 1991

The circular velocity at the radial position *R* is

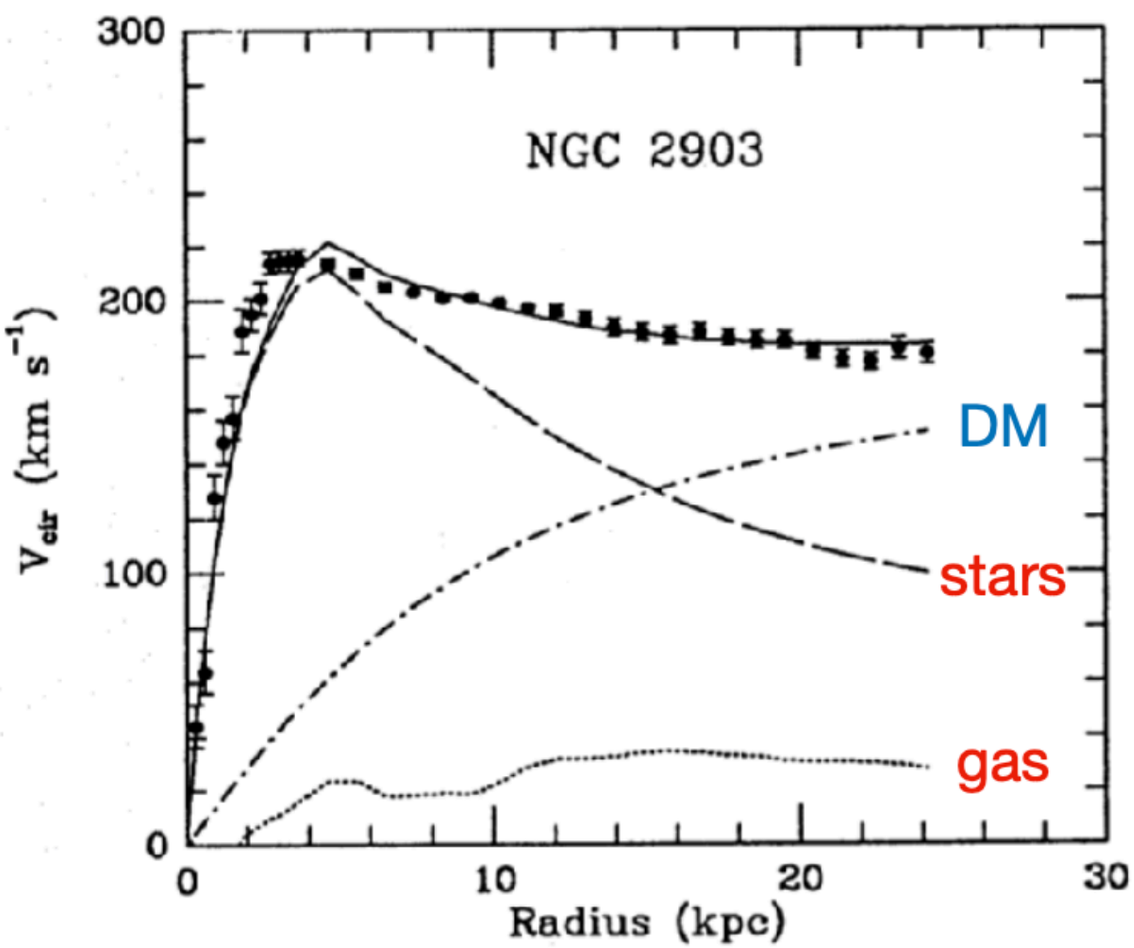
$$v_c(R) = \sqrt{\frac{GM(R)}{R}}$$

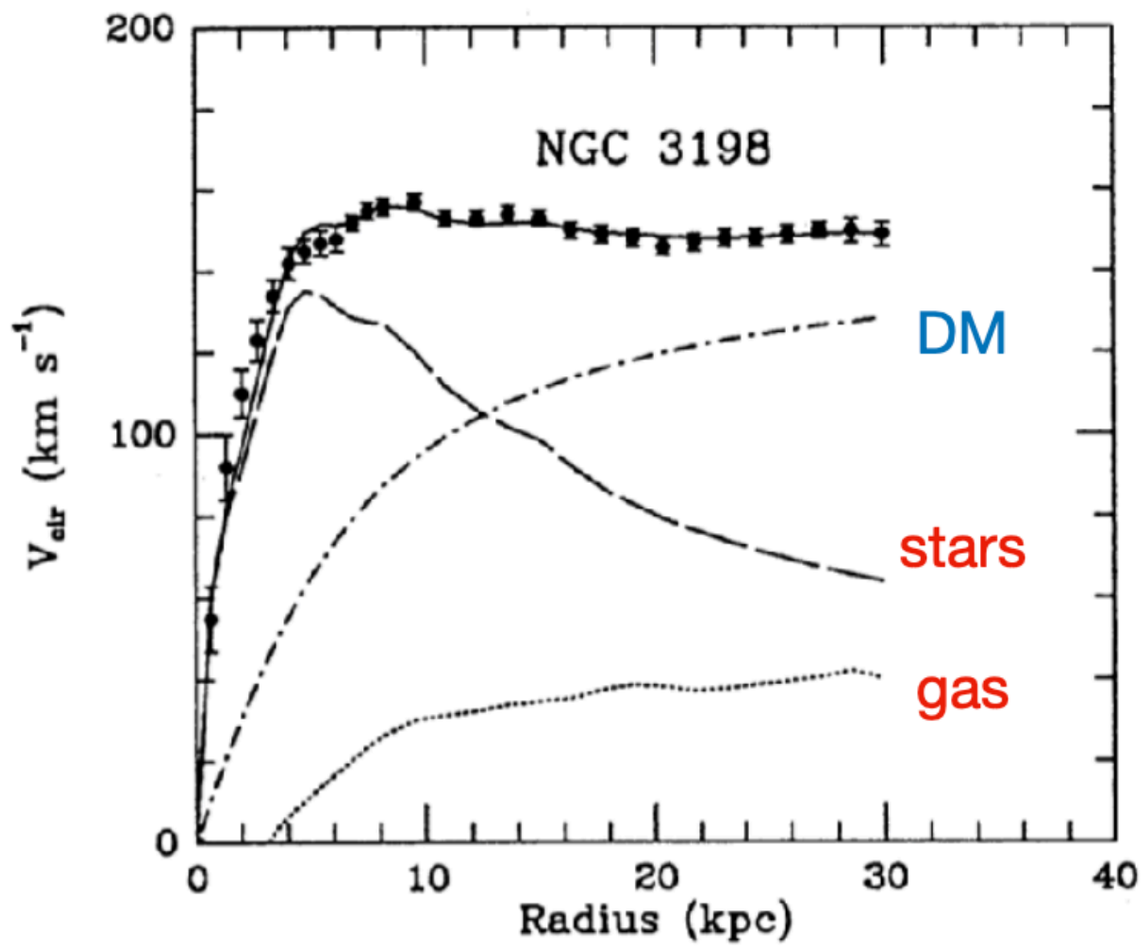
If *R* > *size of system*

the circular velocity is expected to scale

$$v_c(R) \propto 1/R^{1/2}$$

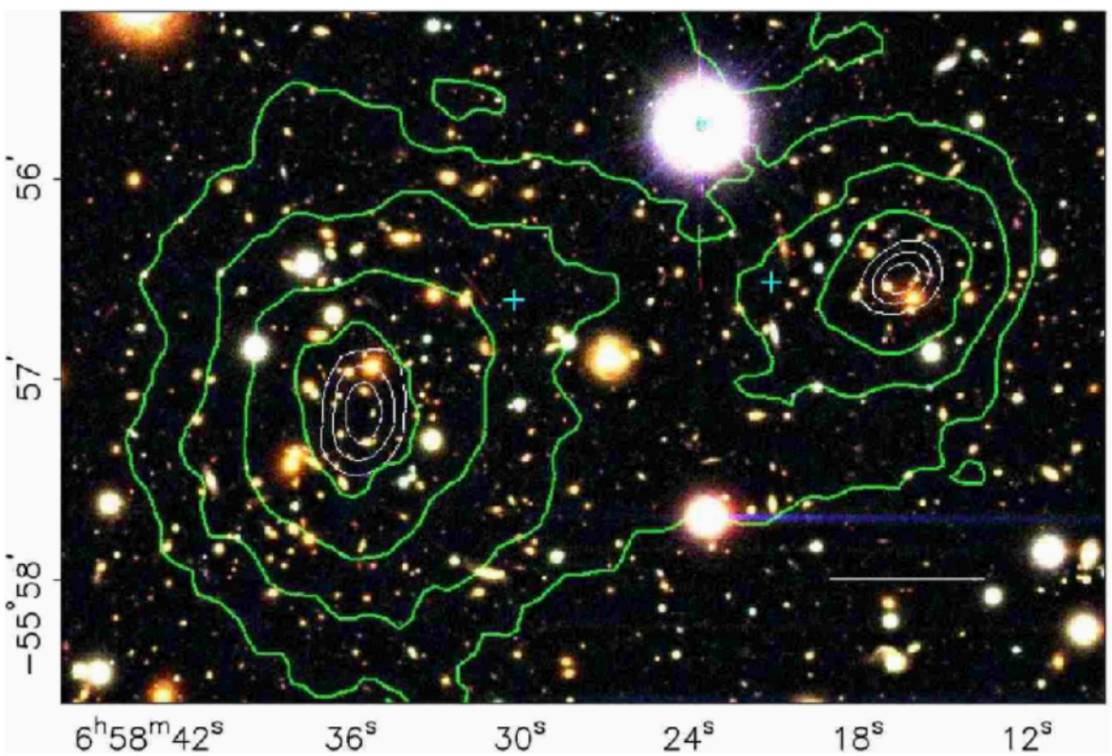
Rotation Curves

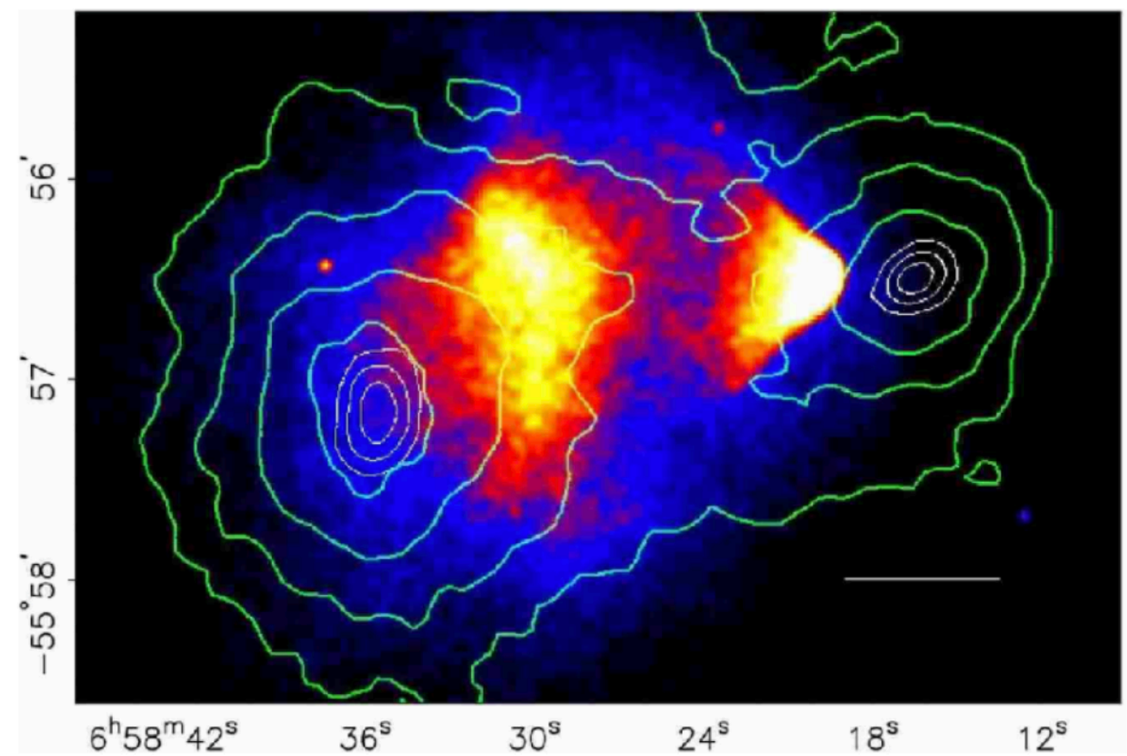




Begeman et al 1991

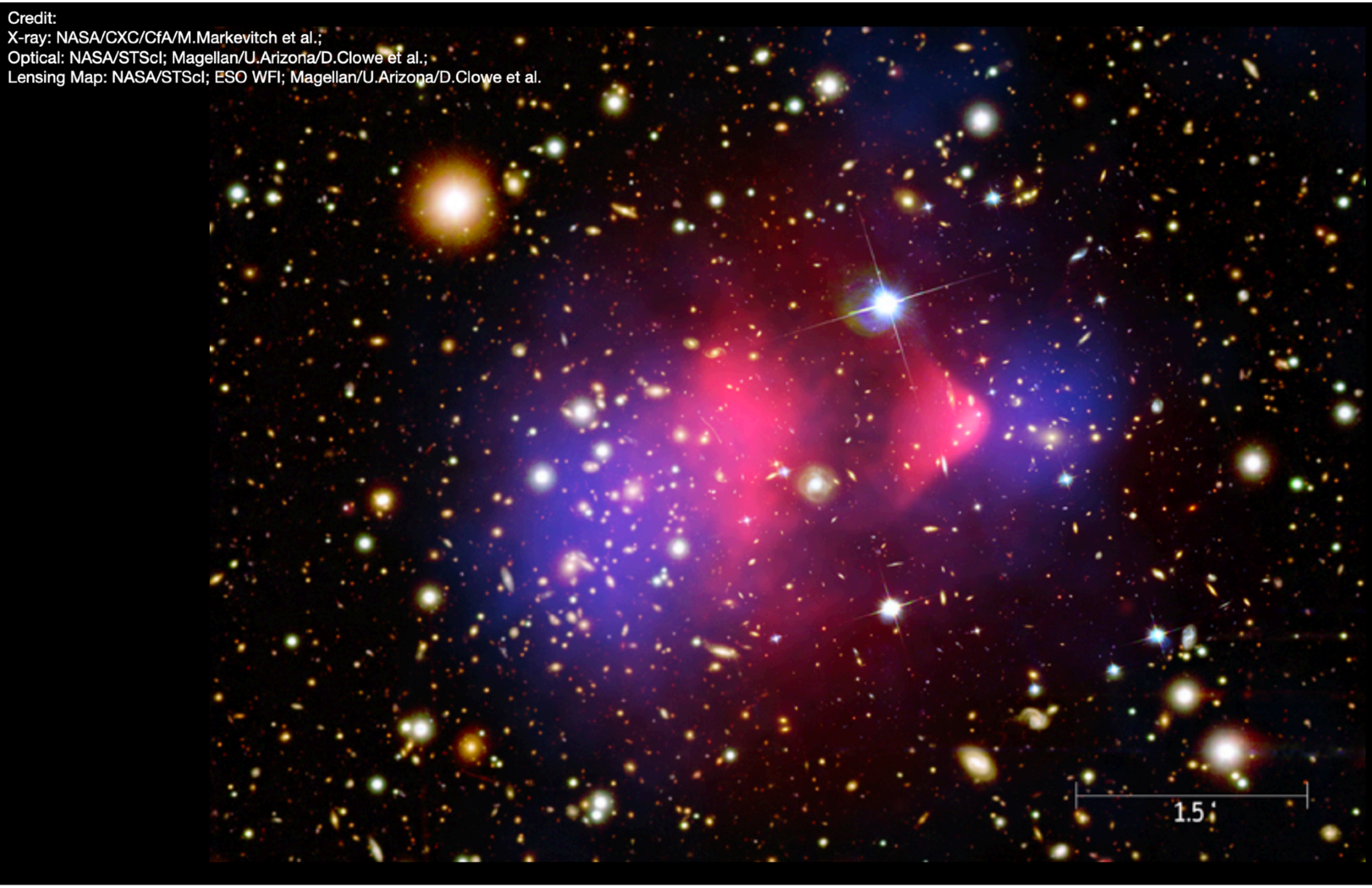
Bullet Cluster



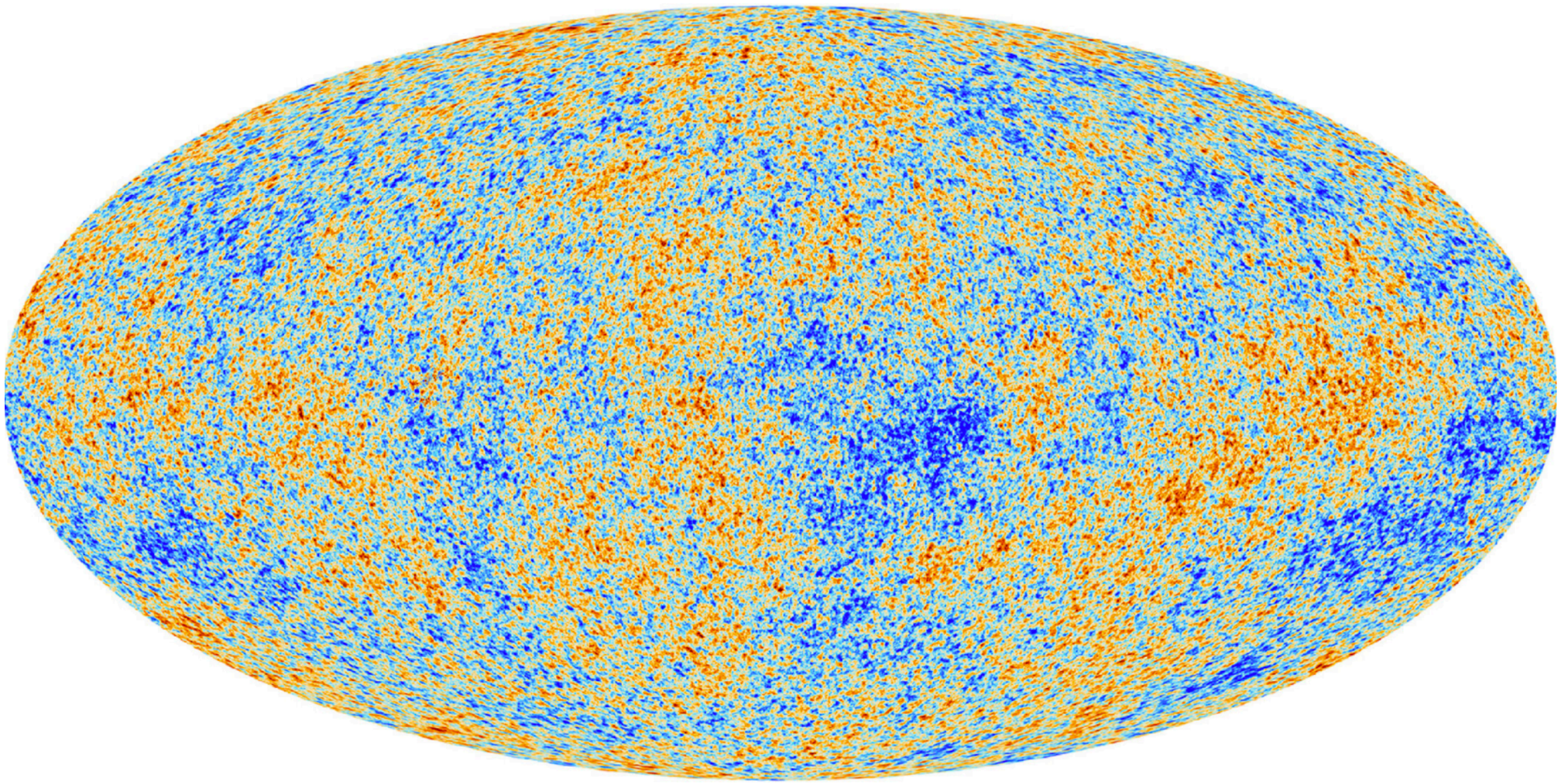


[Clowe et al 2006]

Bullet Cluster



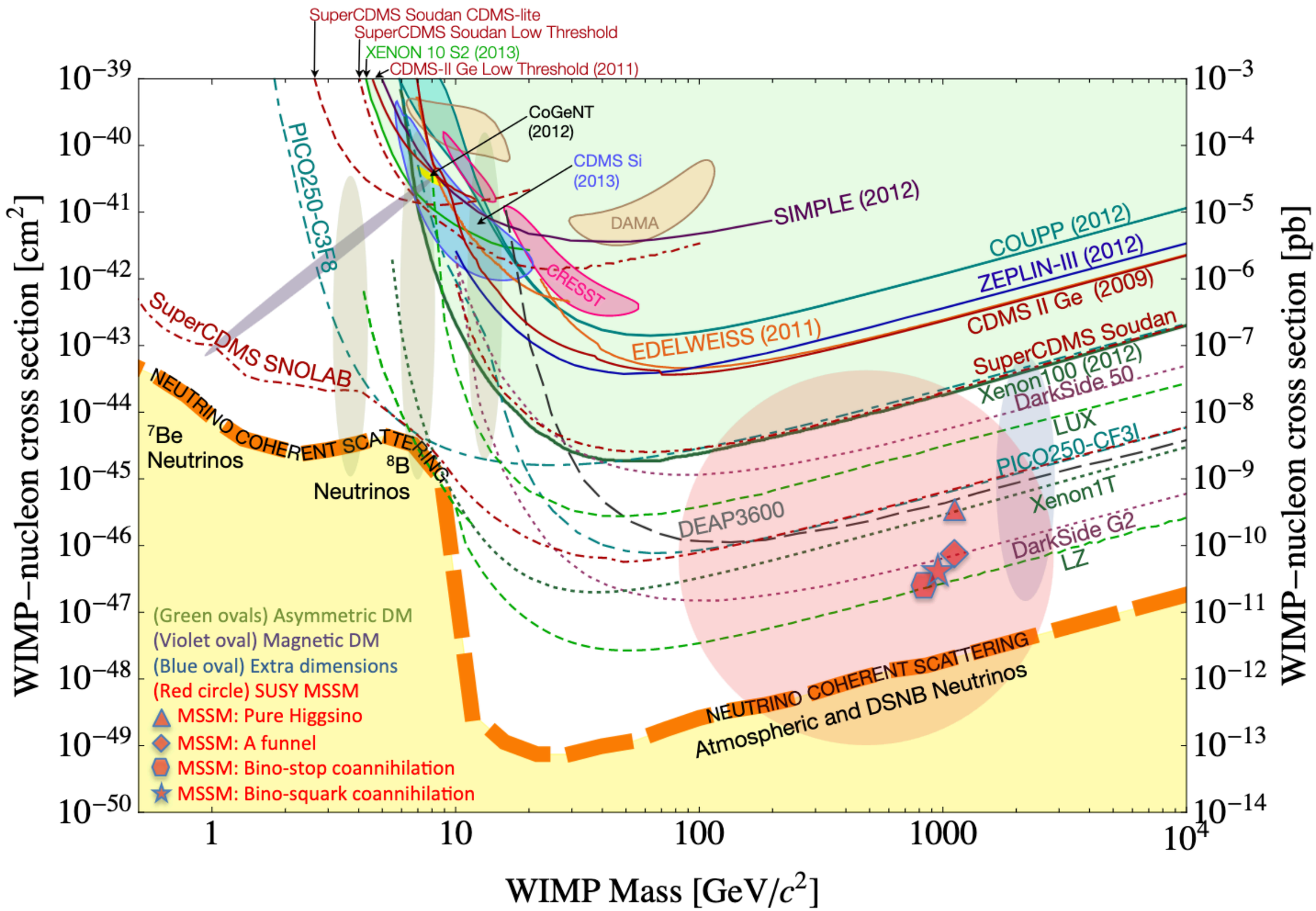
CMB



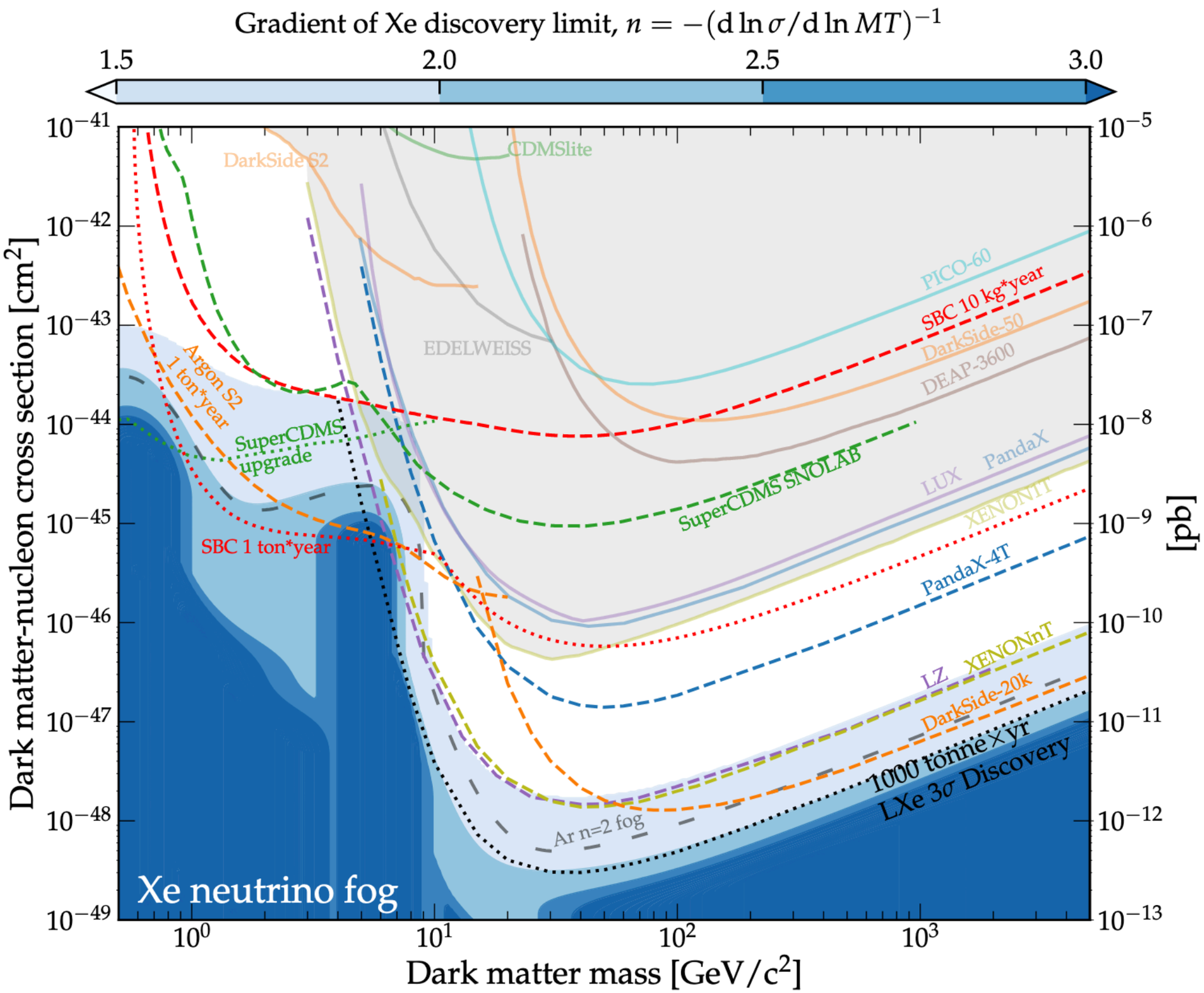
Credit: ESA and the Planck Collaboration

https://chrisnorth.github.io/planckapps/Simulator/#

DM Direct Detection

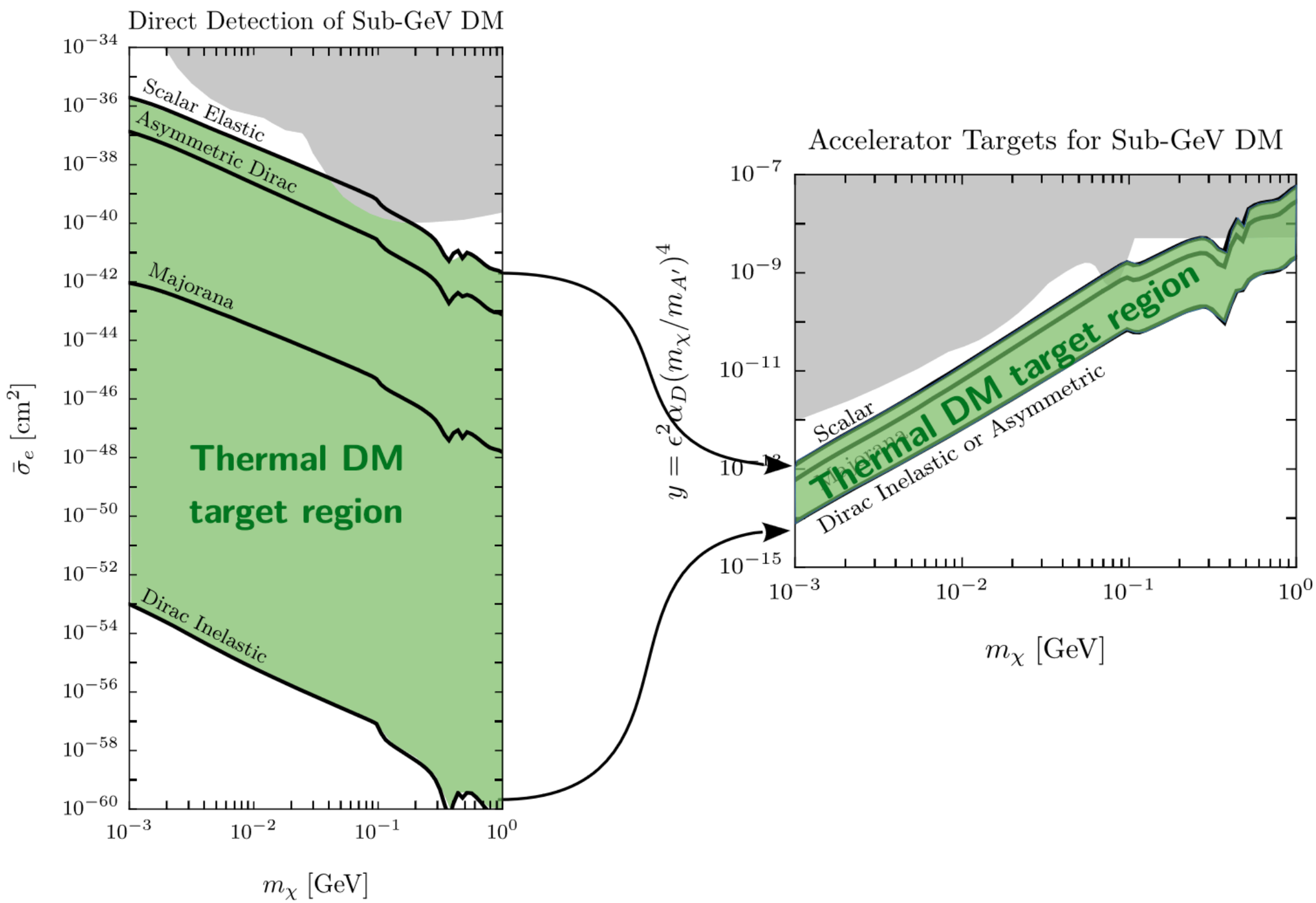


DM Direct Detection (2022)



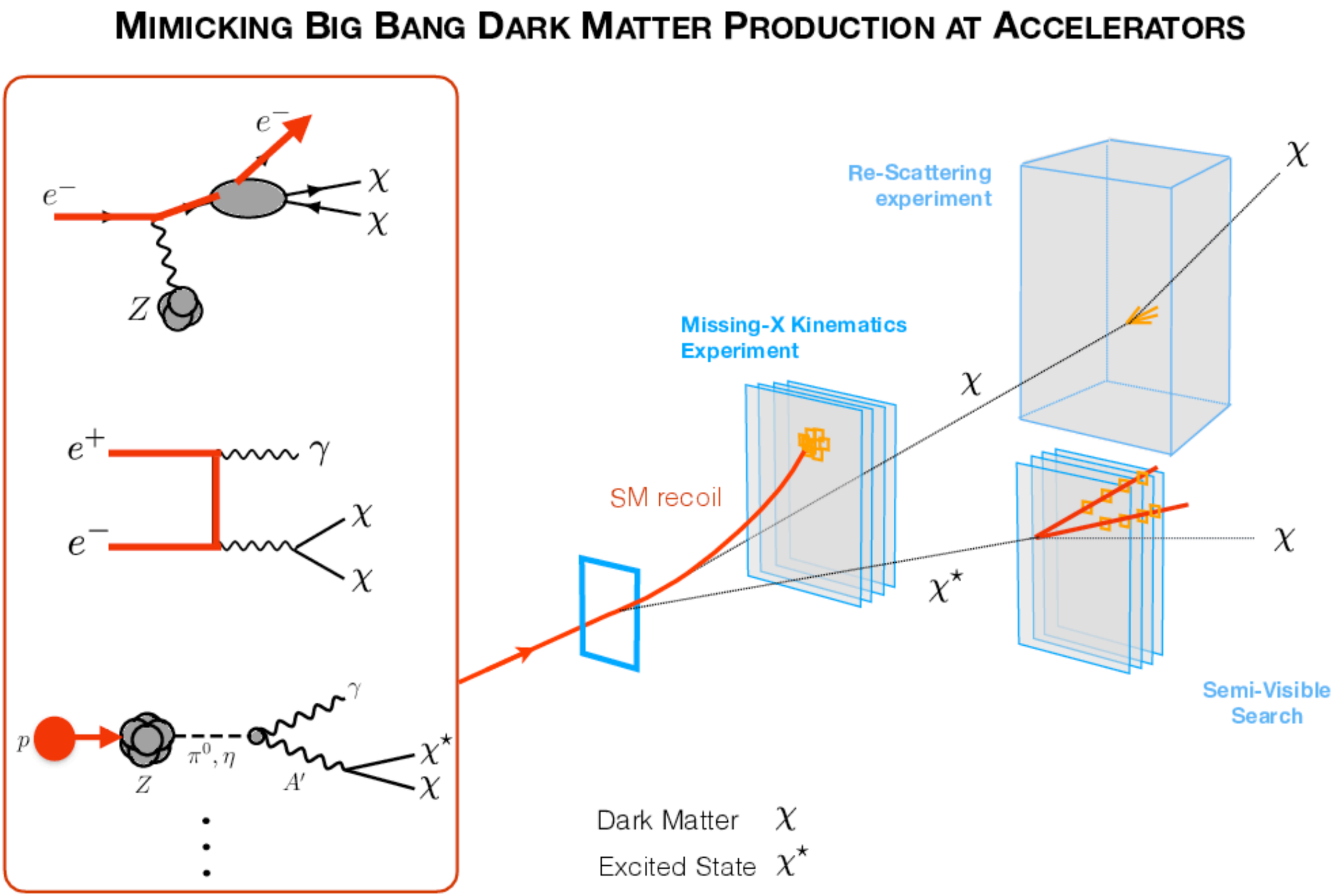
2203.08084

DM at Accelerators



2207.00597

DM at Accelerators



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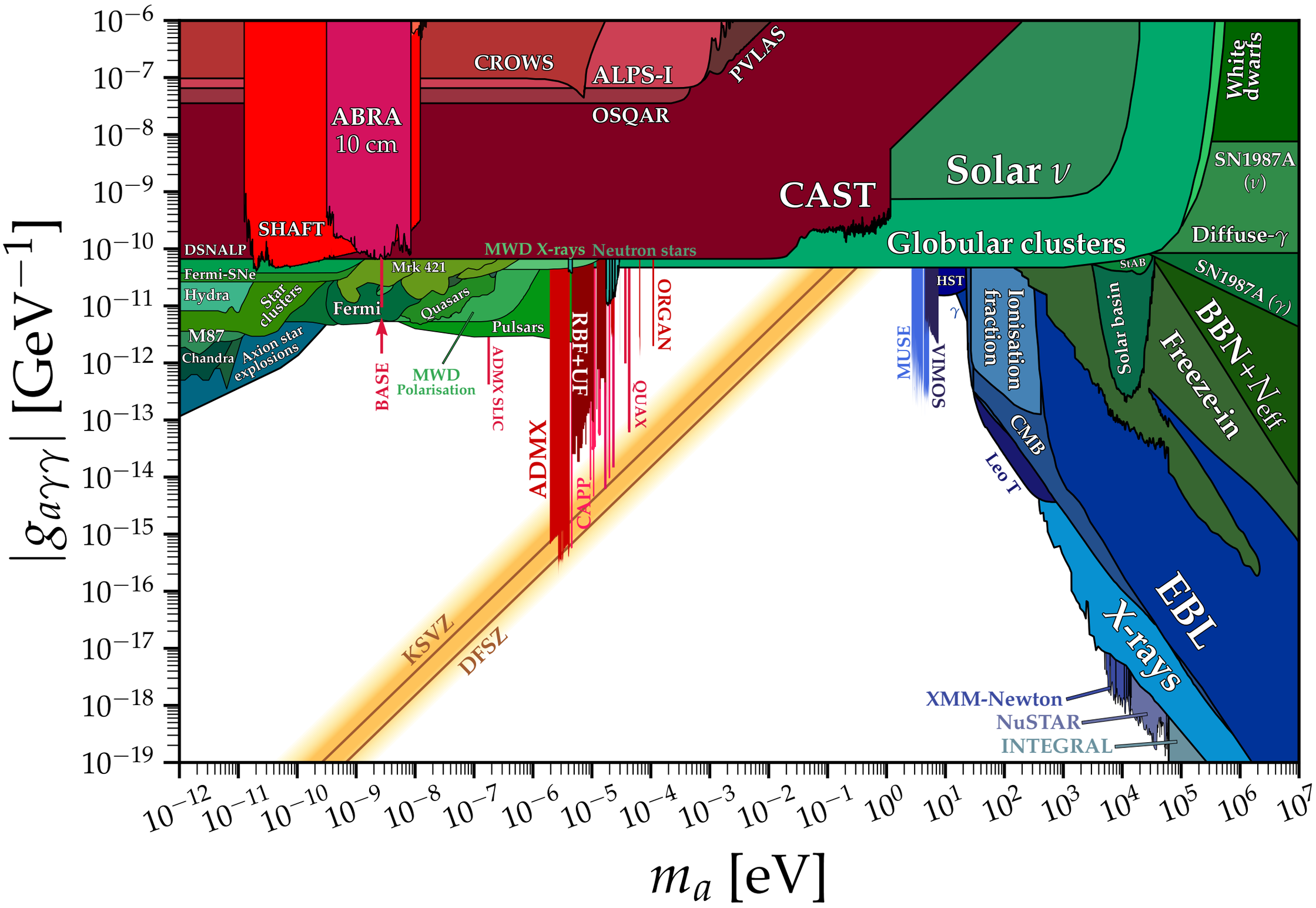
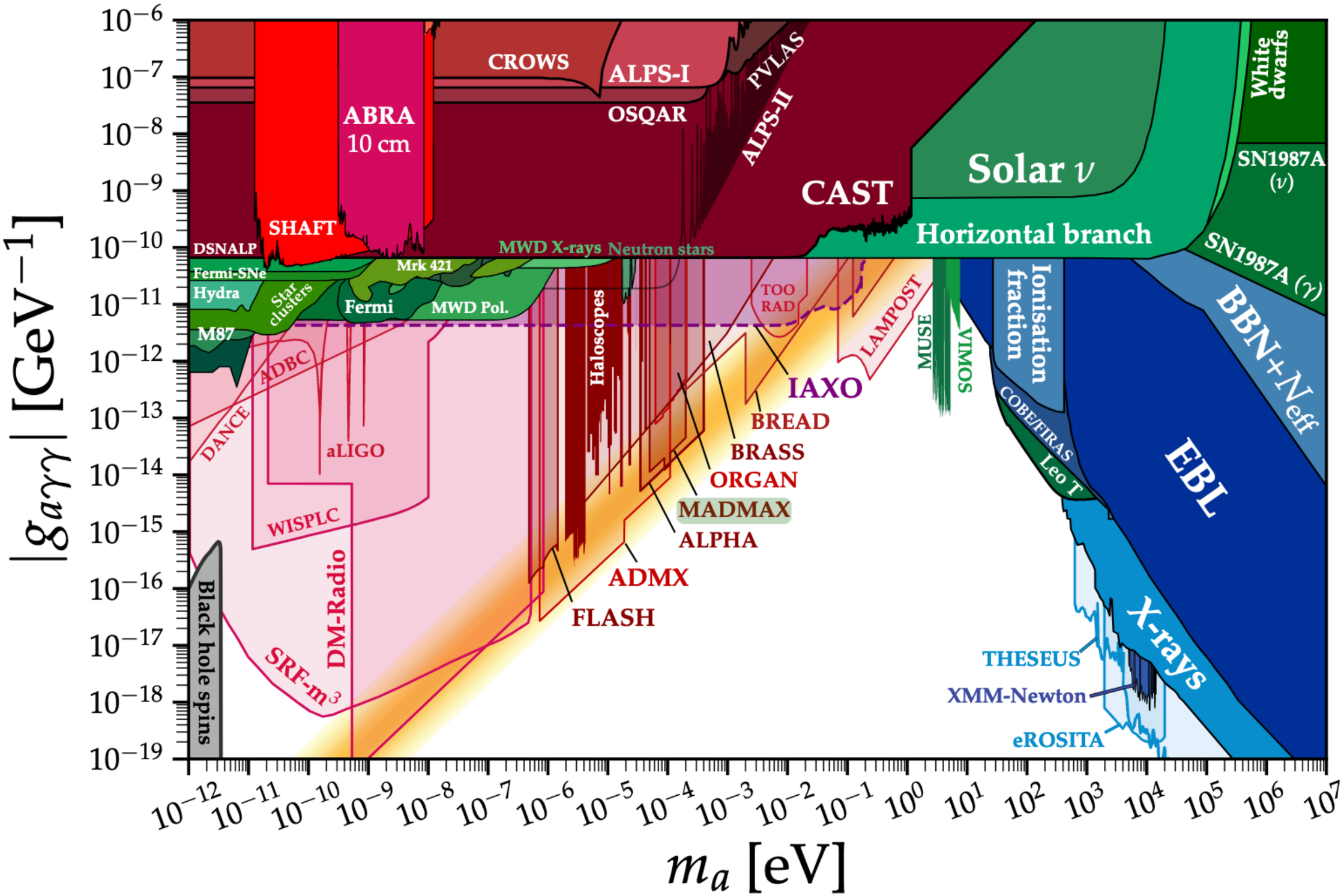
Axions



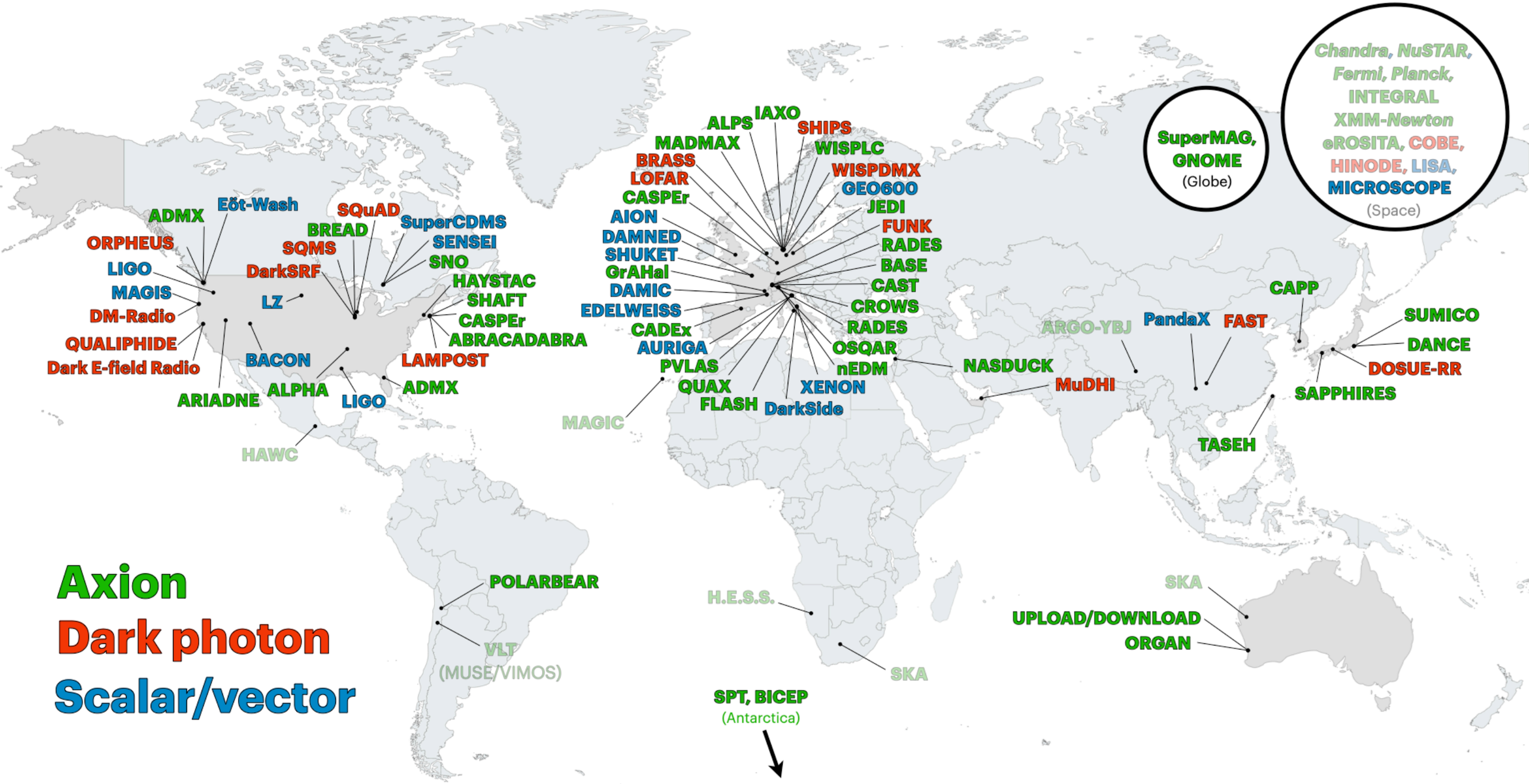
https://github.com/cajohare/AxionLimits

Axions



https://github.com/cajohare/AxionLimits

Axions



https://github.com/cajohare/AxionLimits