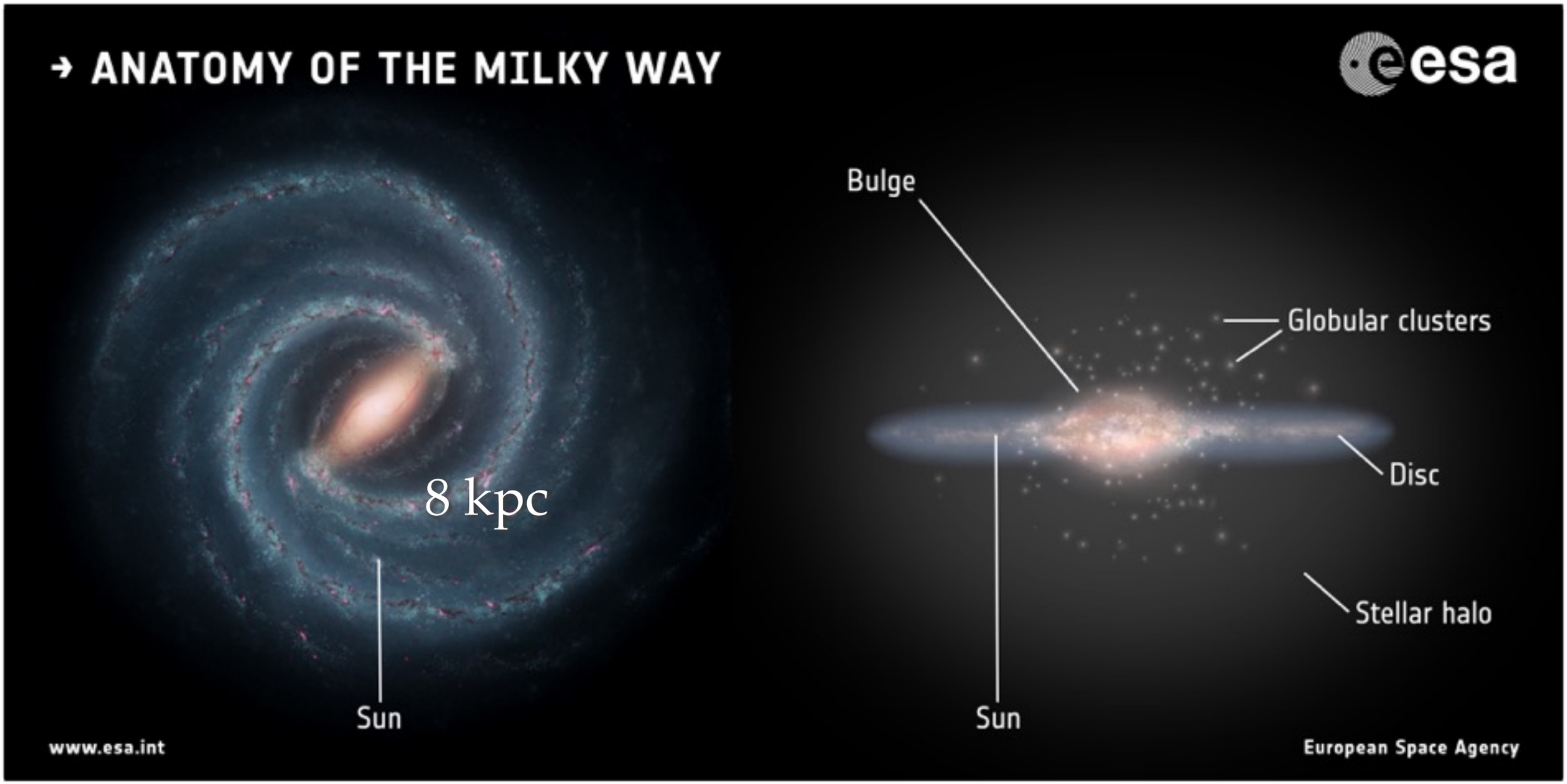
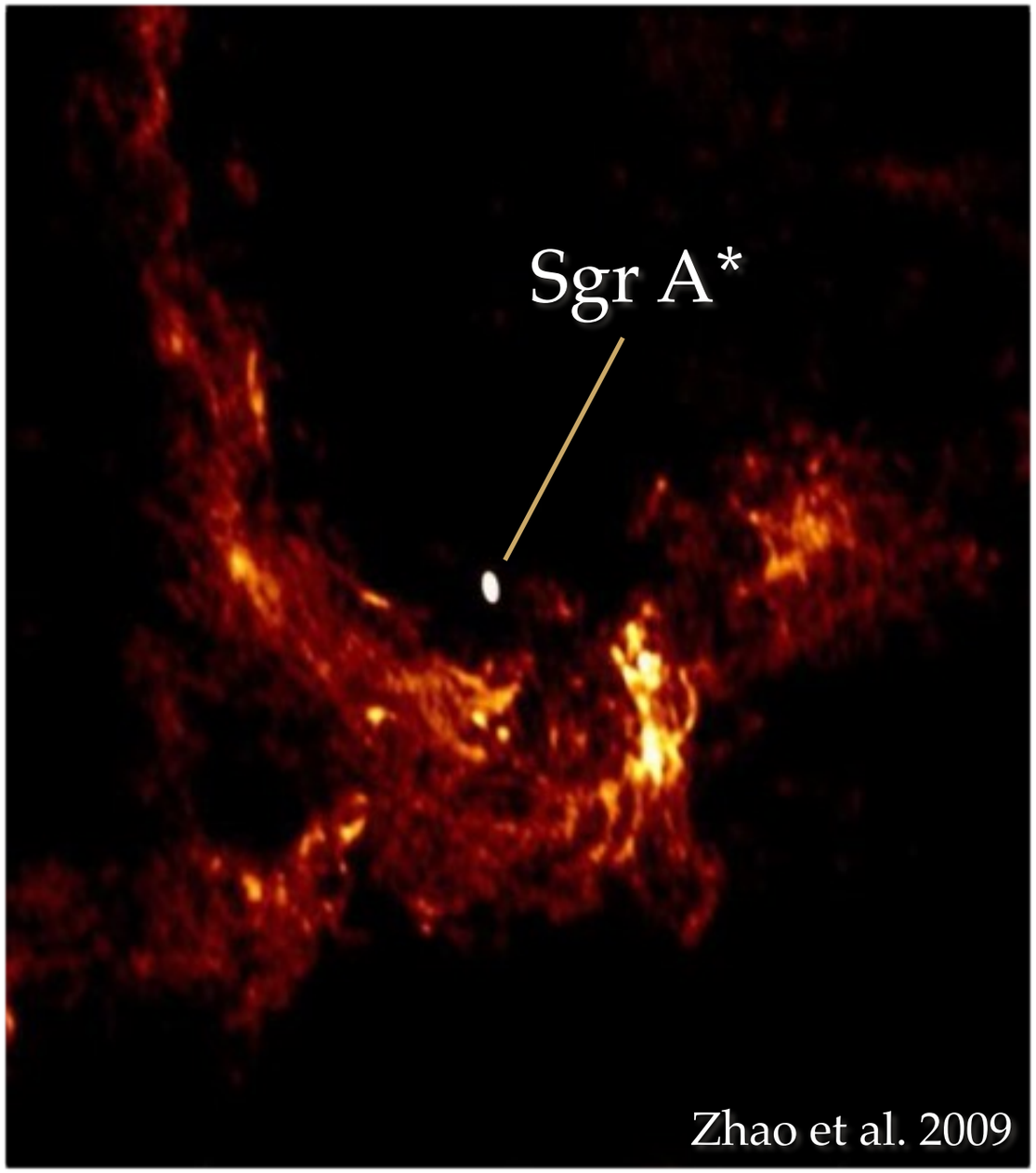
Journée des doctorants de l'APC — November 10, 2016

The giant black hole at the Galactic centre

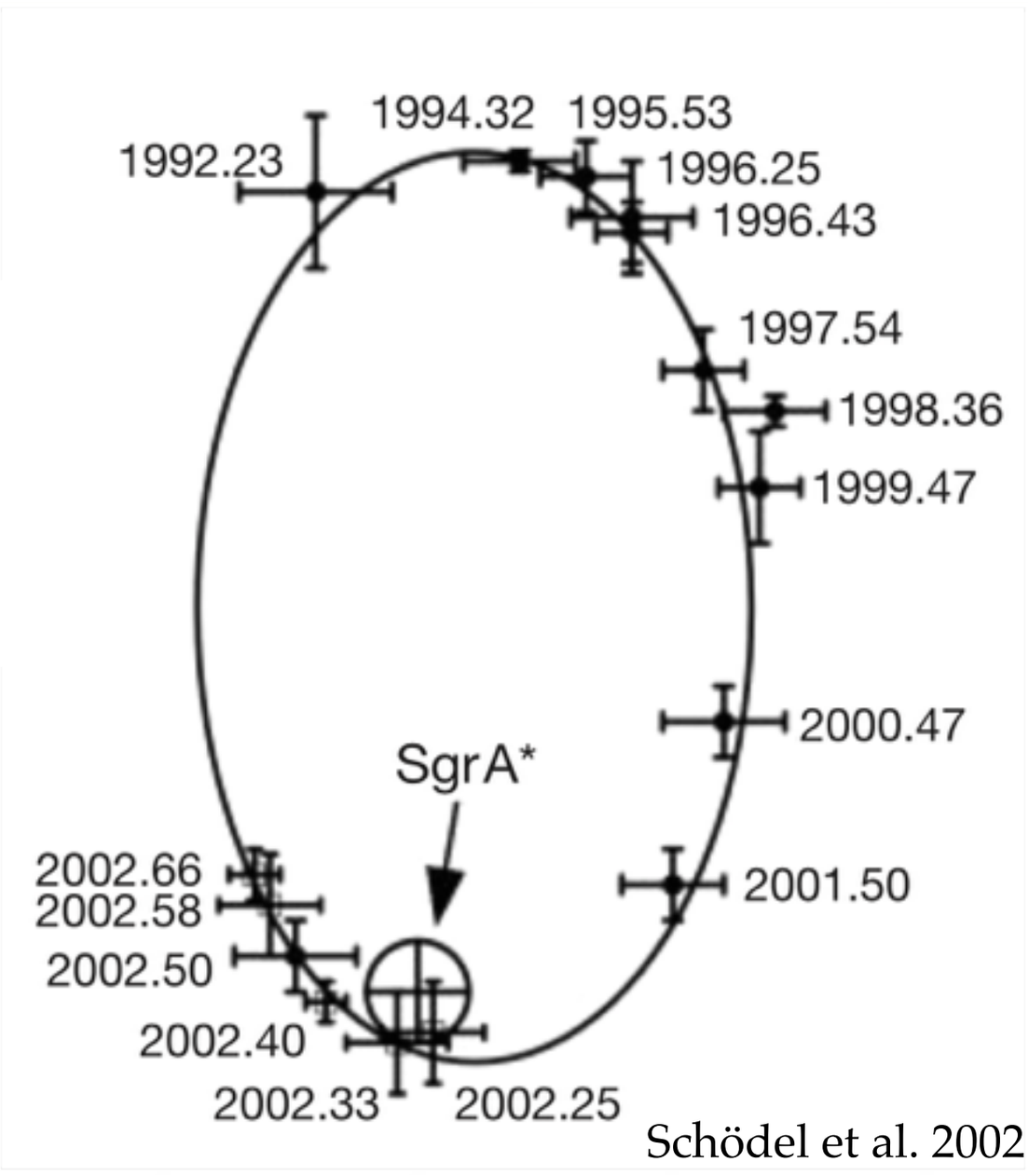
Dimitri Chuard
Advisors: A. Goldwurm, R. Terrier


→ ANATOMY OF THE MILKY WAY
esa
8 kpc
Sun
Bulge
Globular clusters
Disc
Stellar halo
Sun
www.esa.int
European Space Agency

From one end of the spectrum to the other

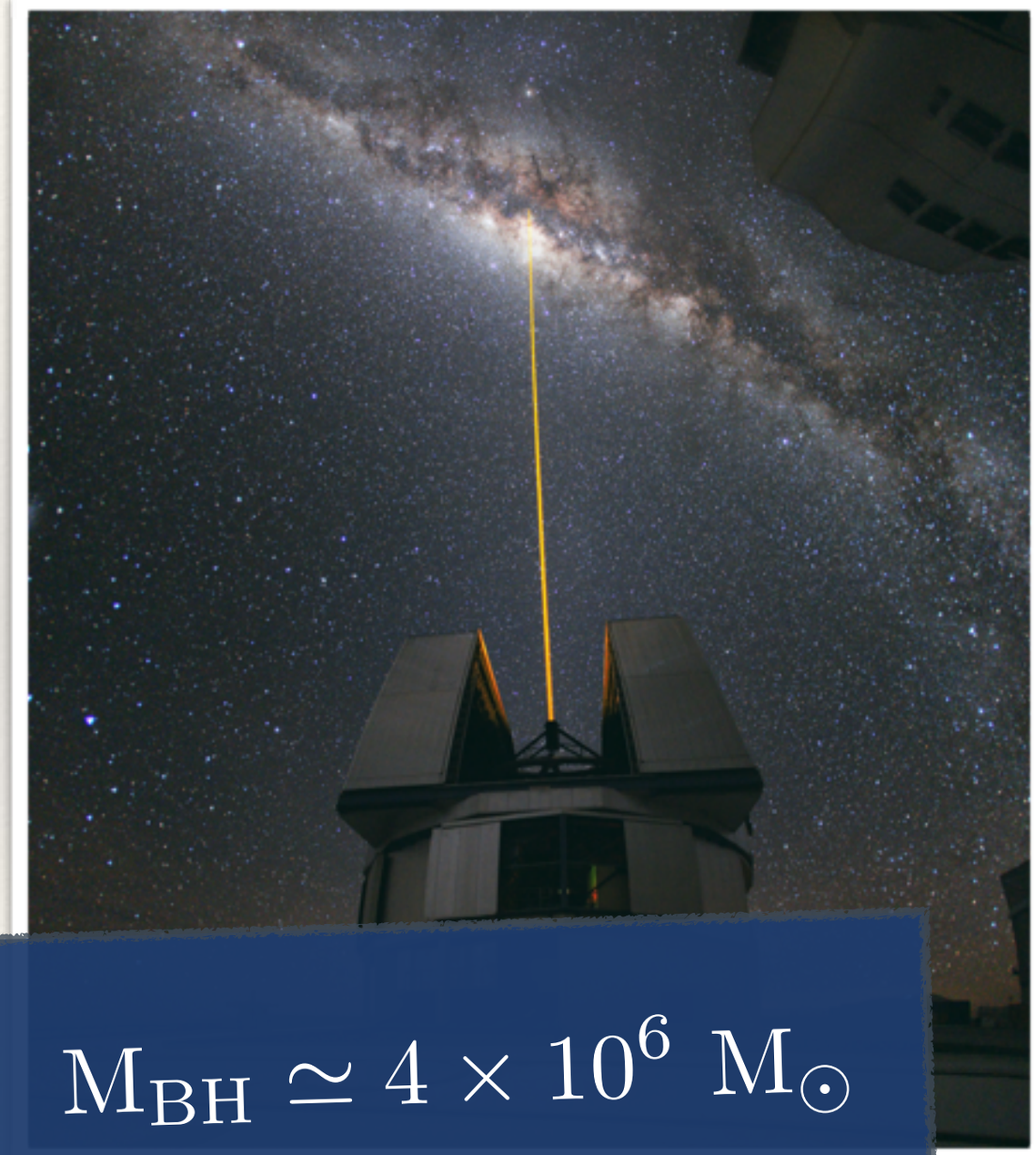


From one end of the spectrum to the other

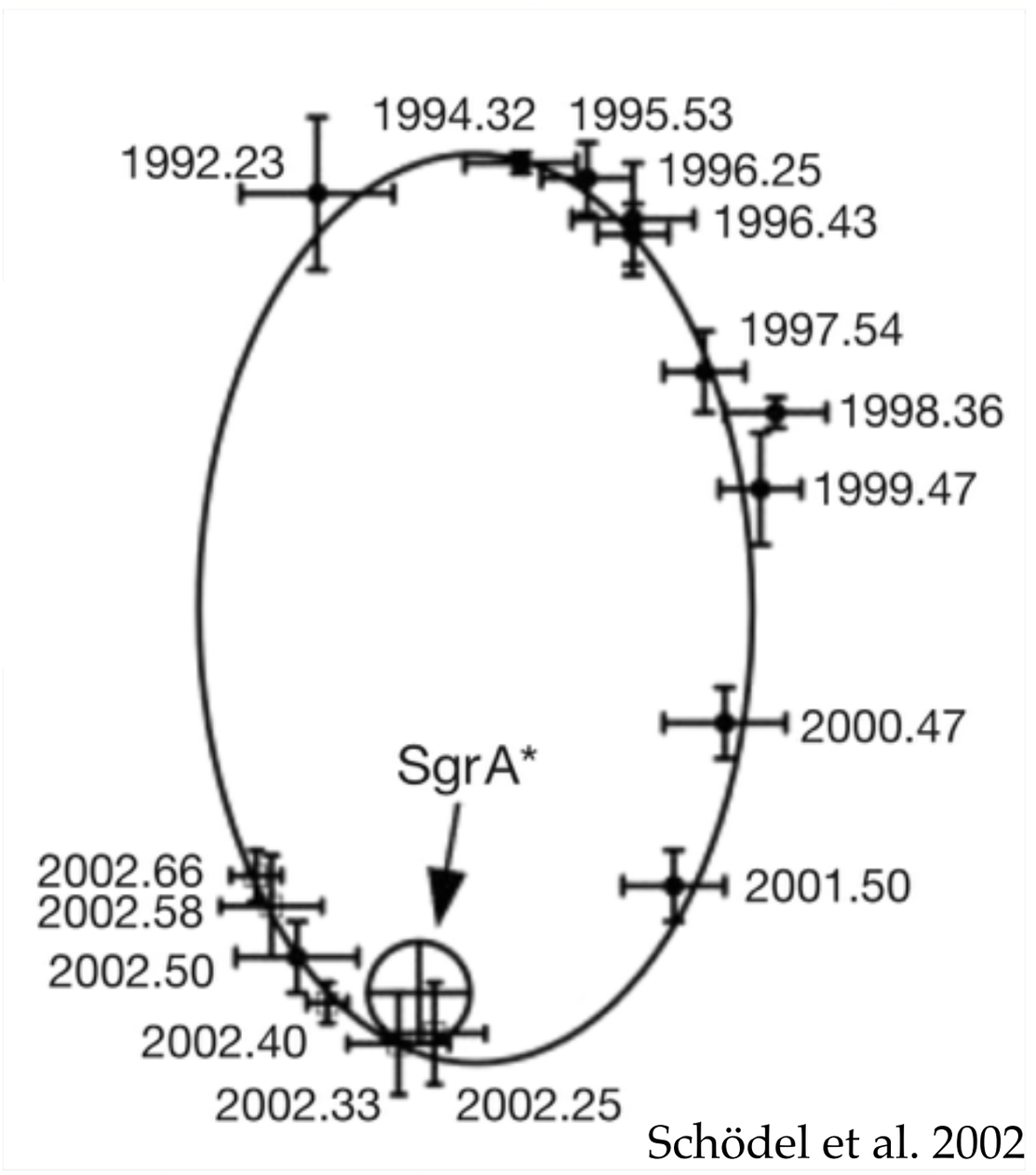


Schödel et al. 2002

From one end of the spectrum to the other



$$M_{BH} \simeq 4 \times 10^6 \, M_\odot$$



Schödel et al. 2002

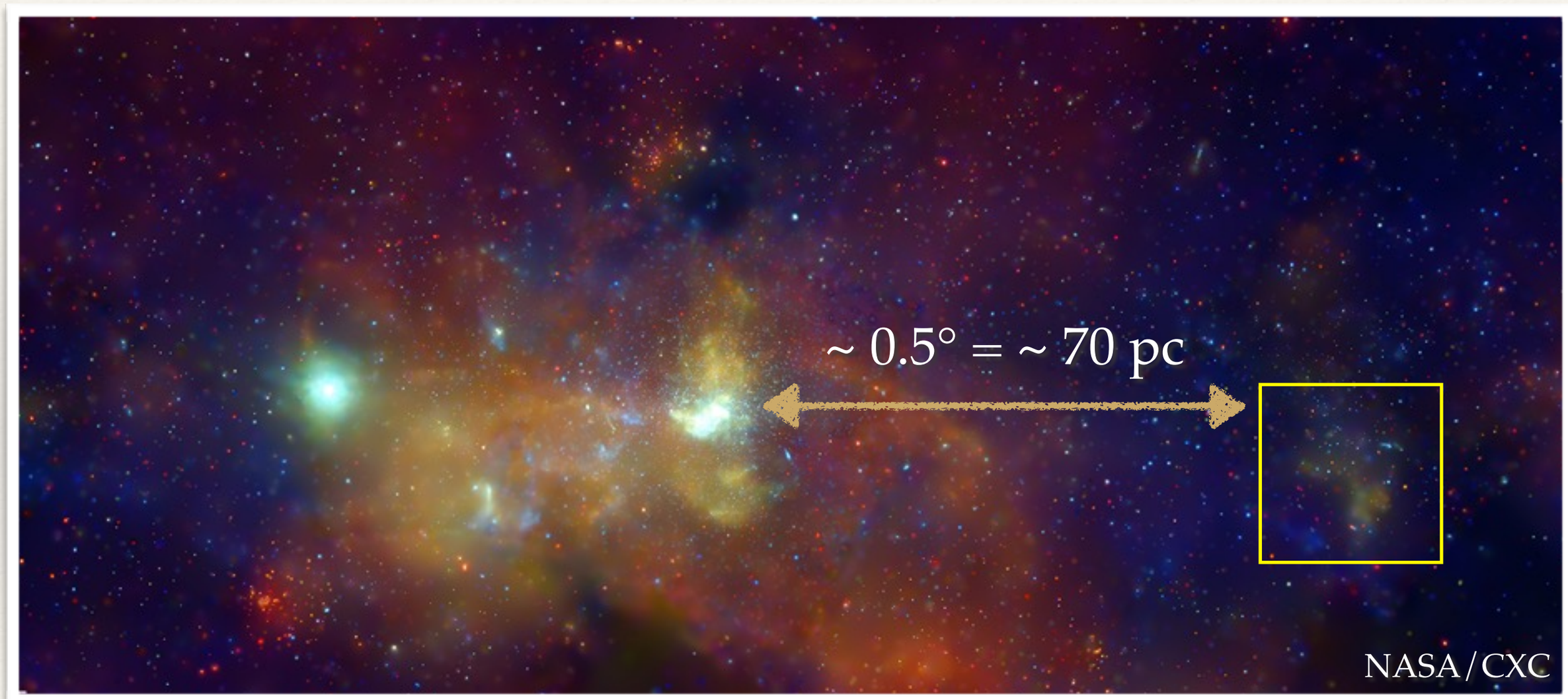
From one end of the spectrum to the other

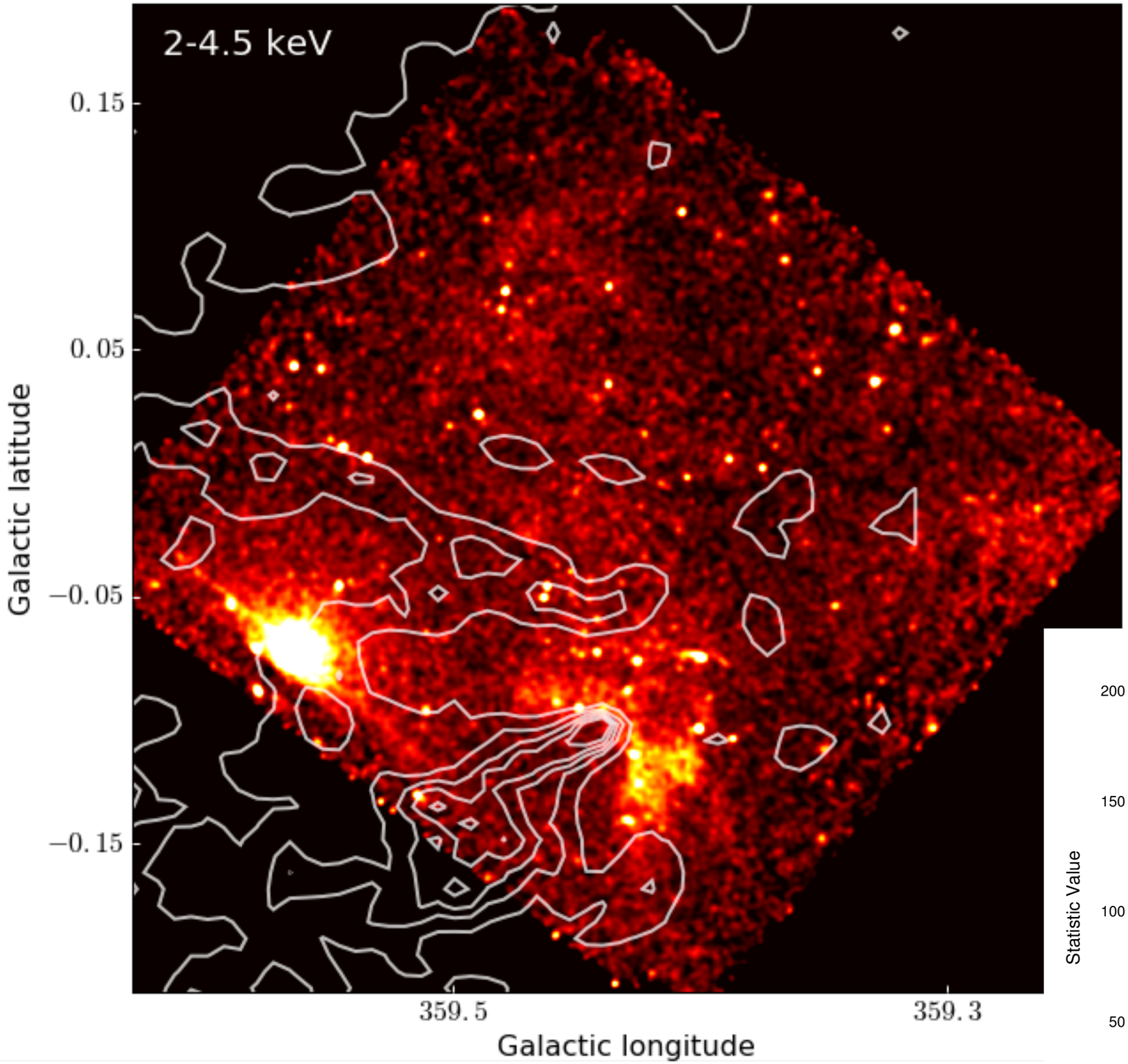
Seeing a black hole? Really?

Sagittarius C

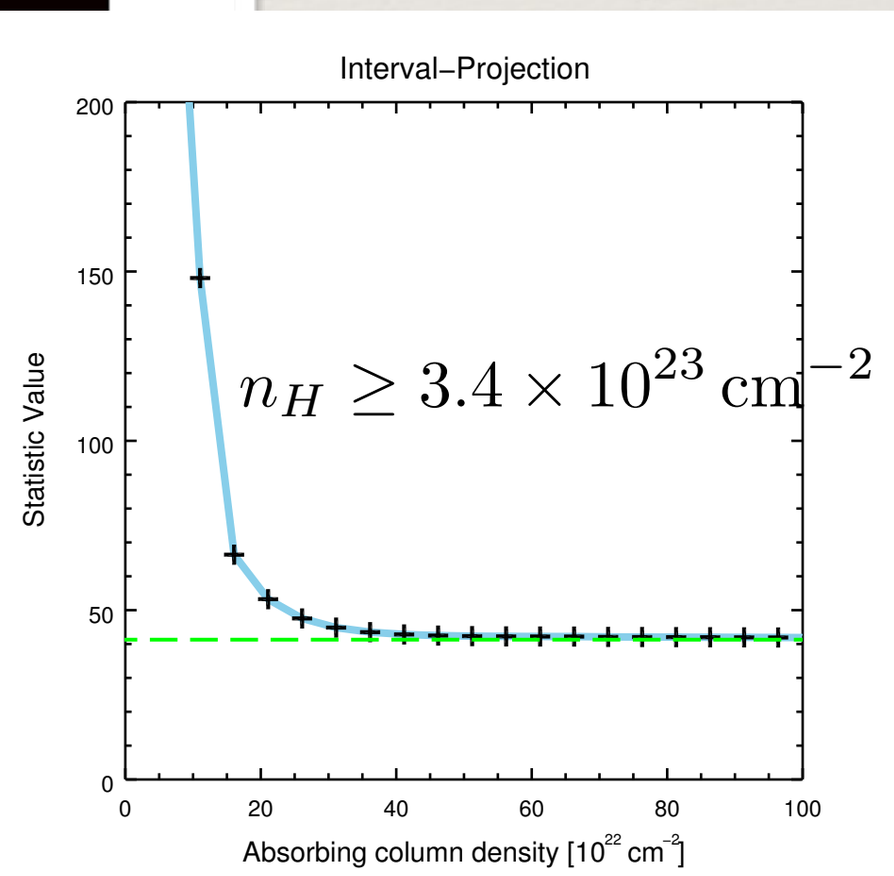
Sagittarius C

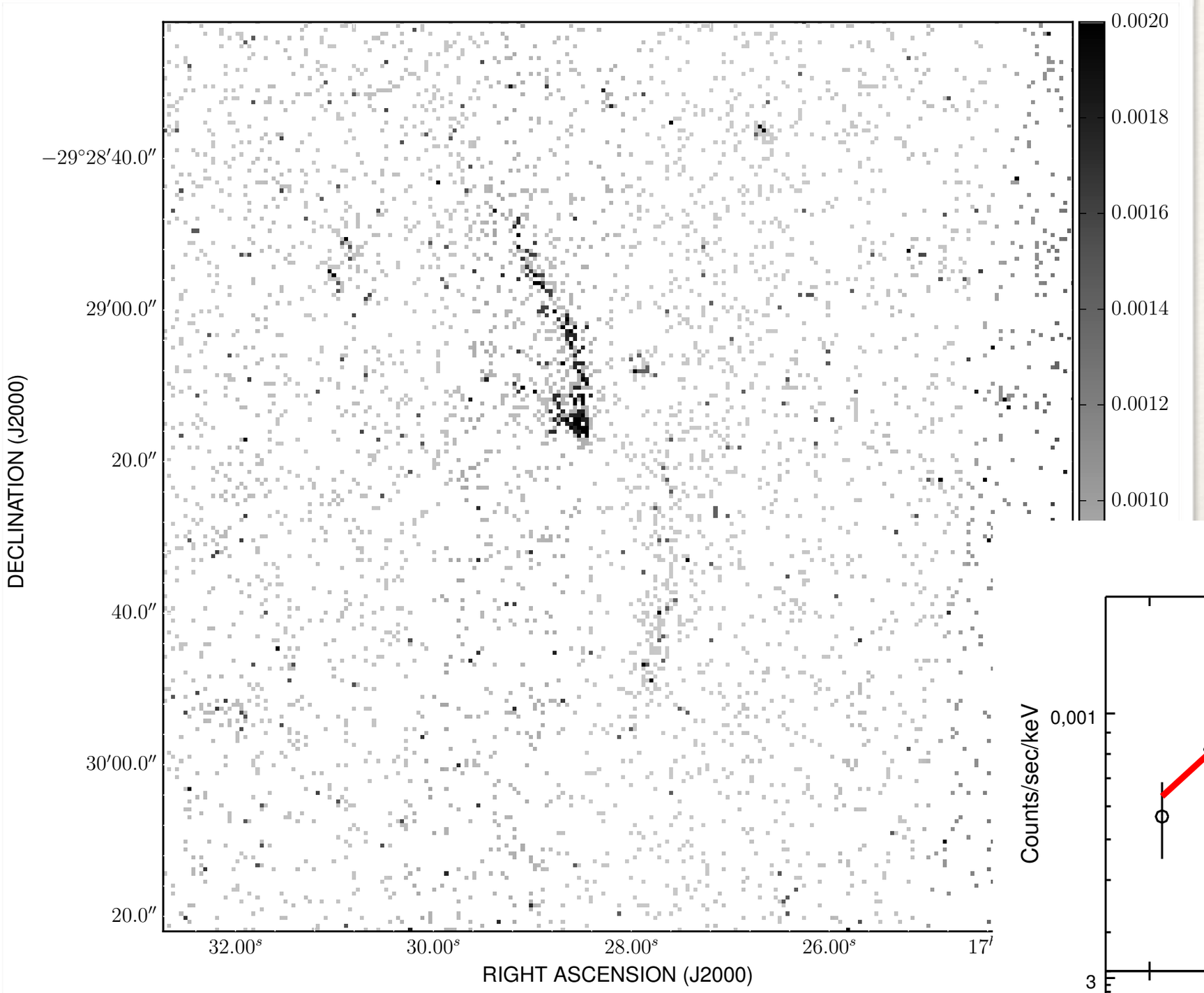
Sagittarius C





Chuard et al. (in prep.)





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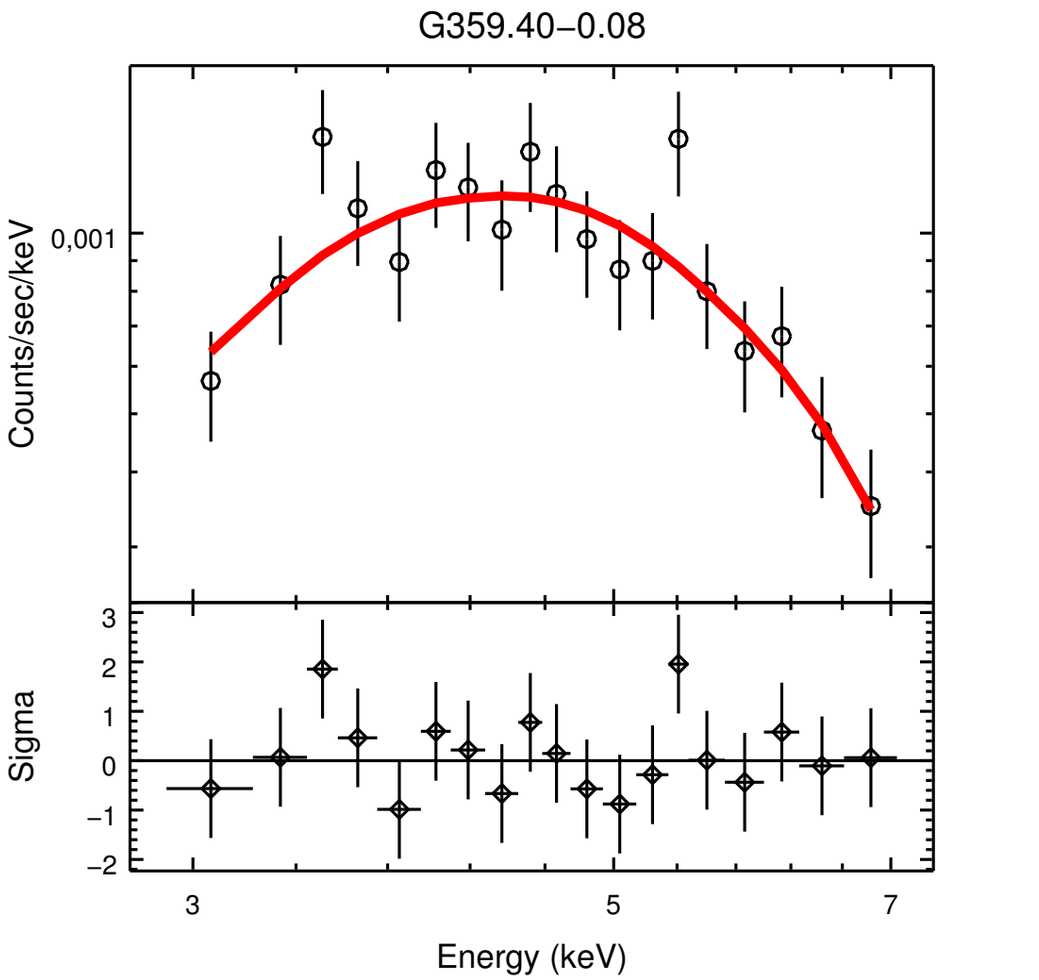
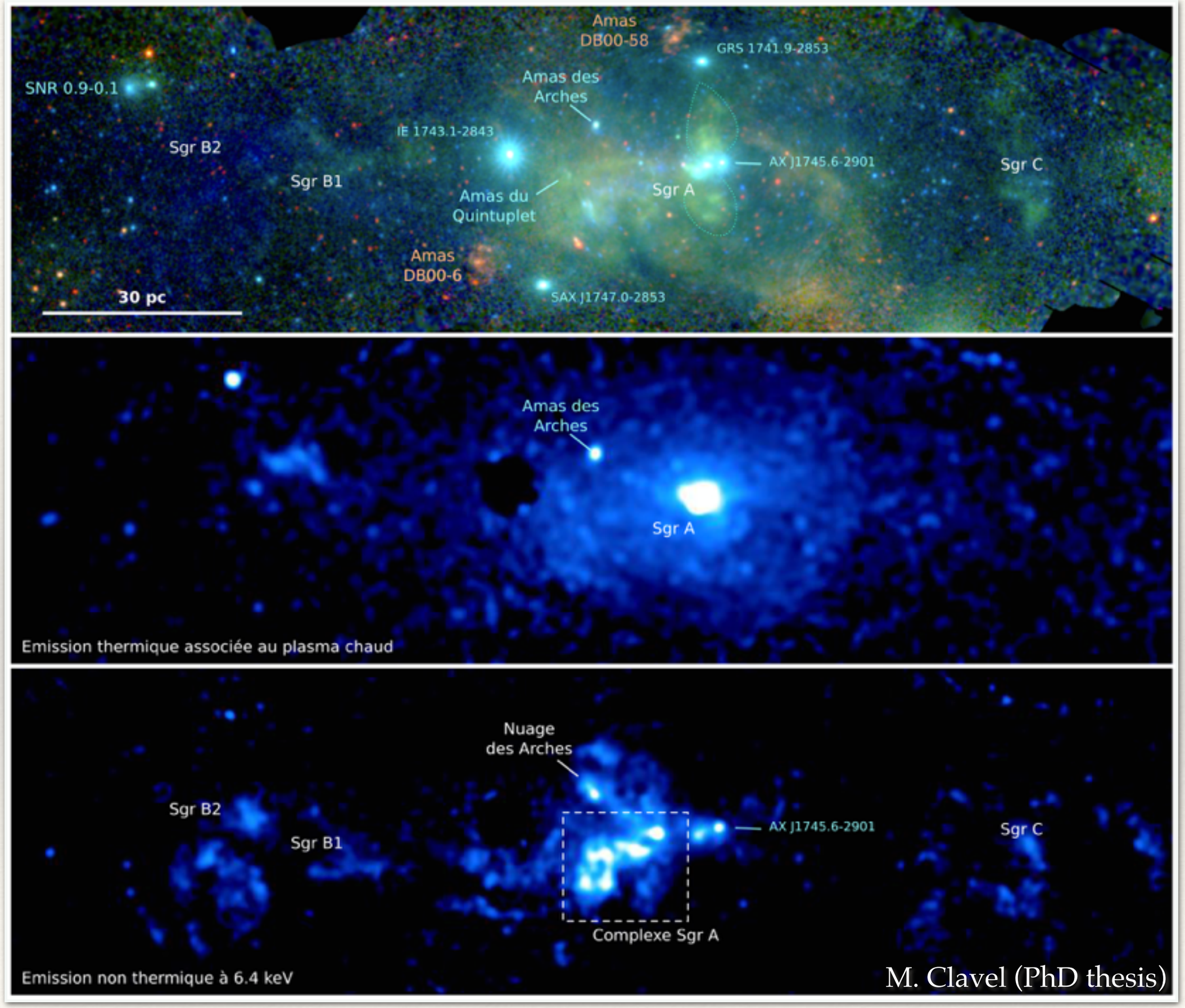
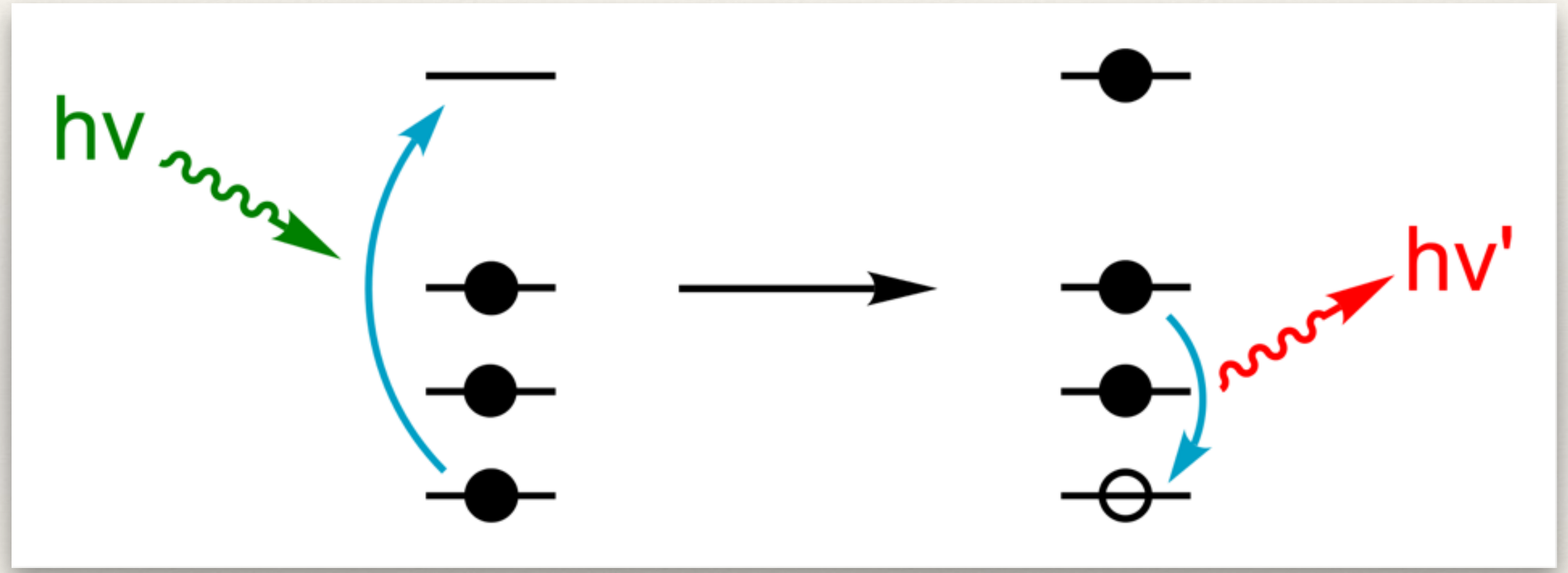




M. Clavel (PhD thesis)

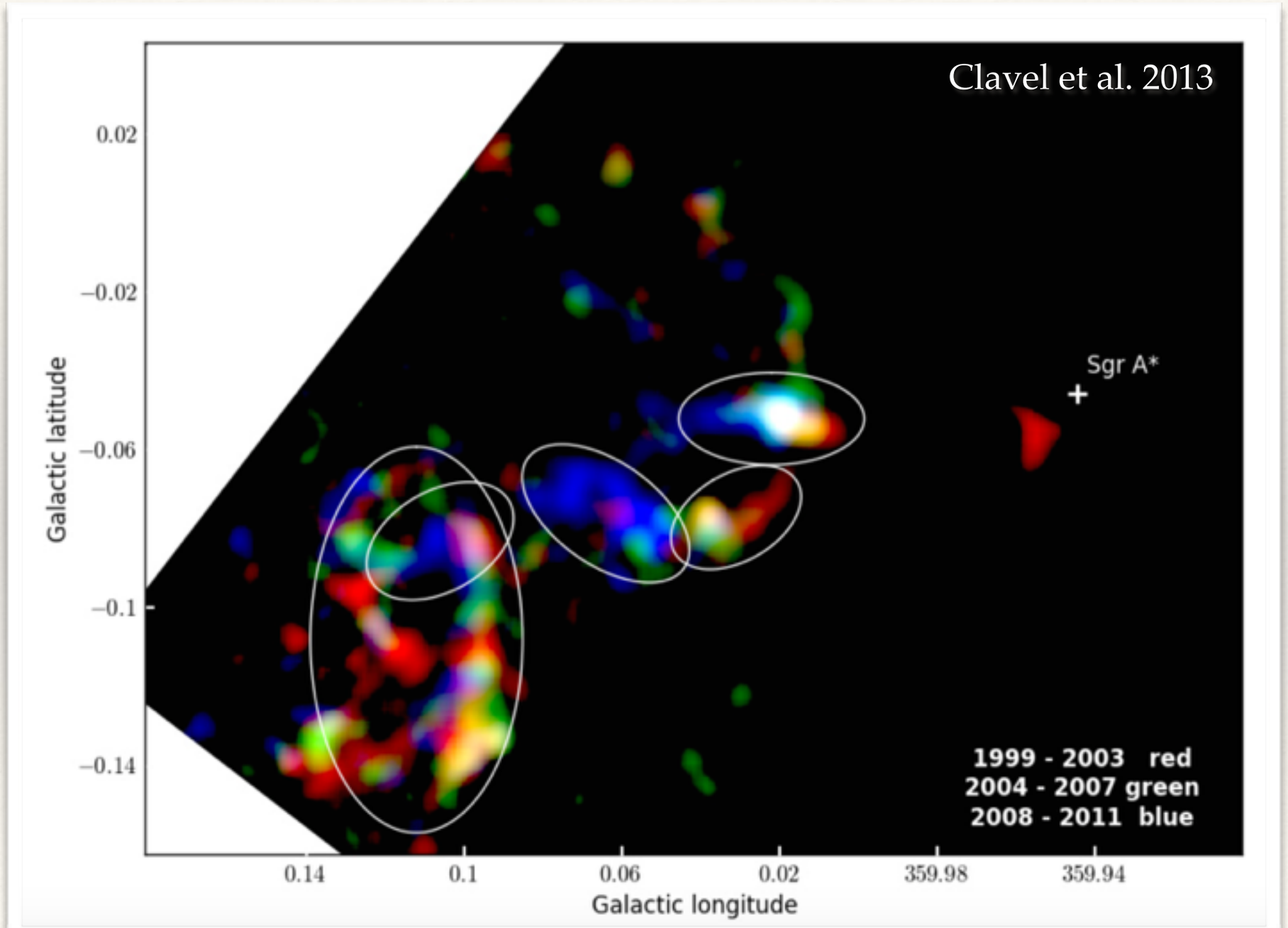
6.4 keV iron line



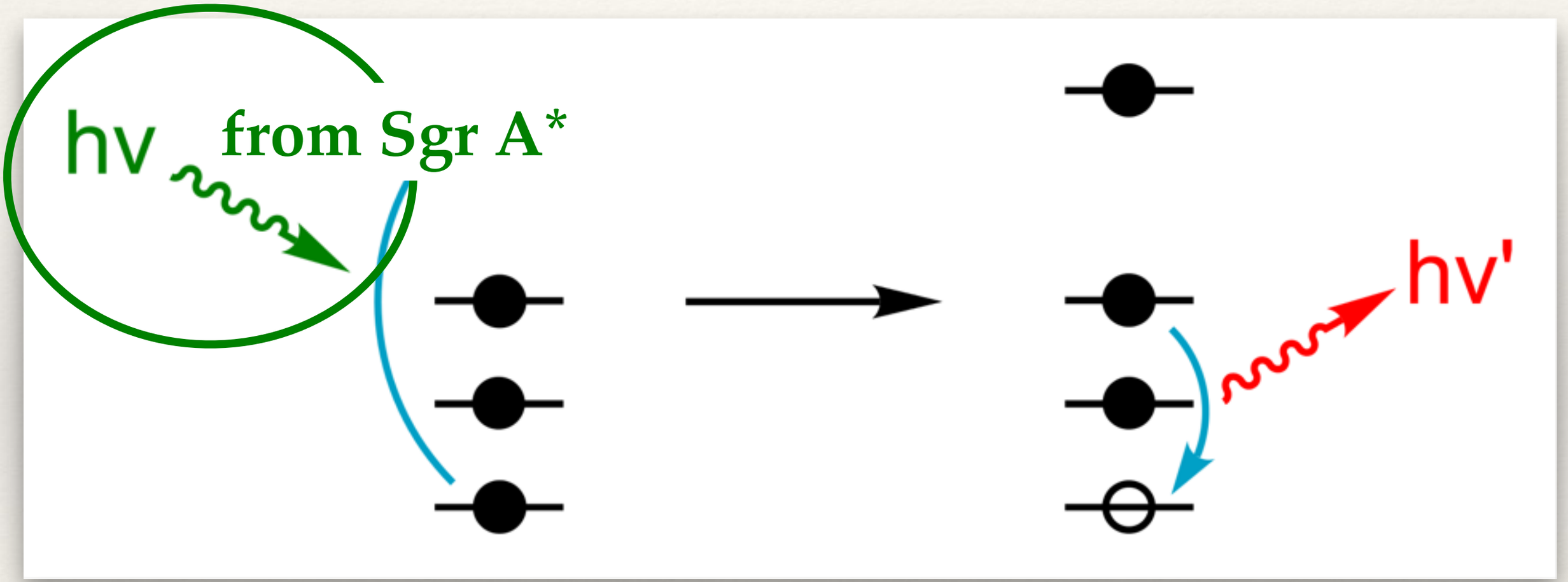
$$2p \rightarrow 1s$$

$$E = 6.4 \text{ keV}$$

Variability of the non-thermal emission



6.4 keV iron line



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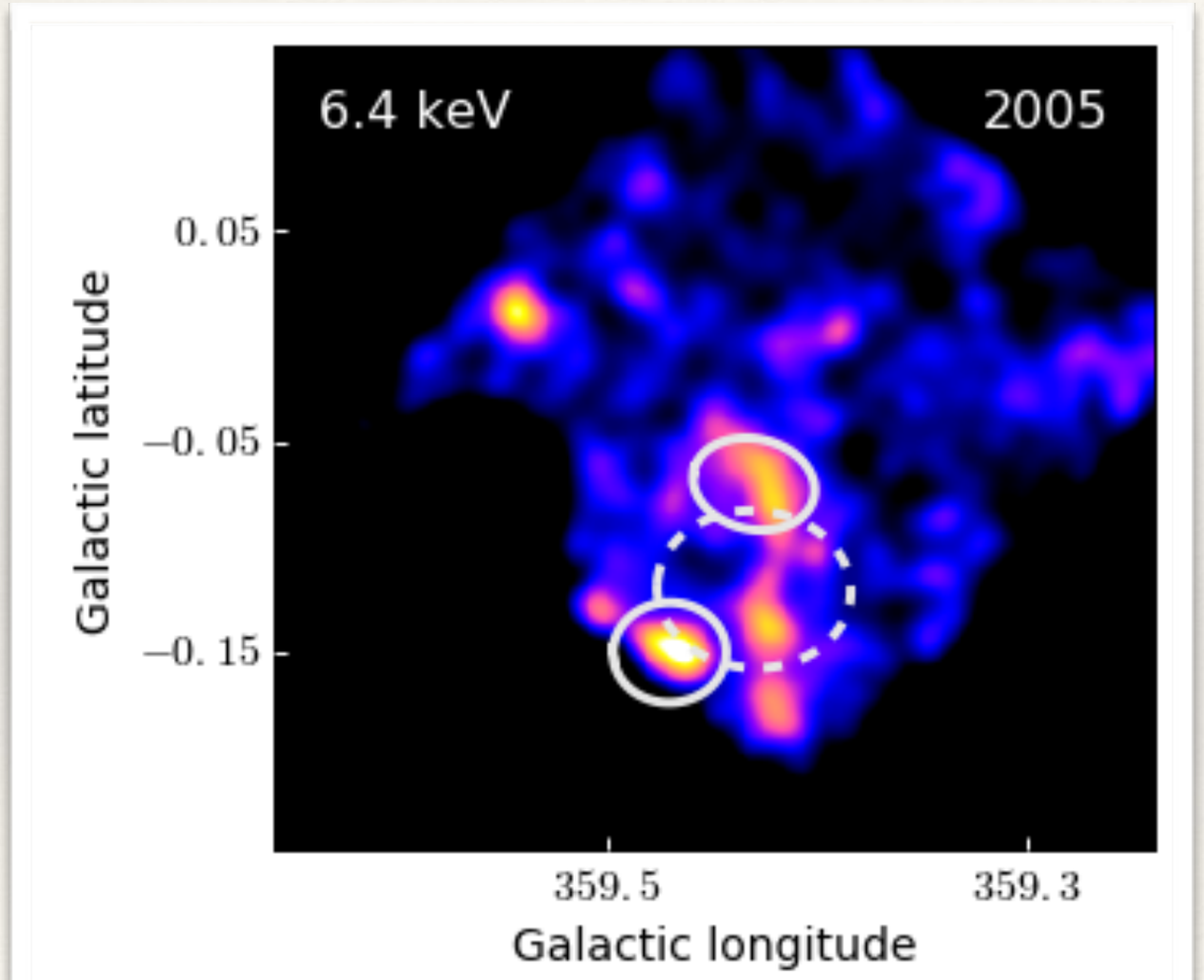
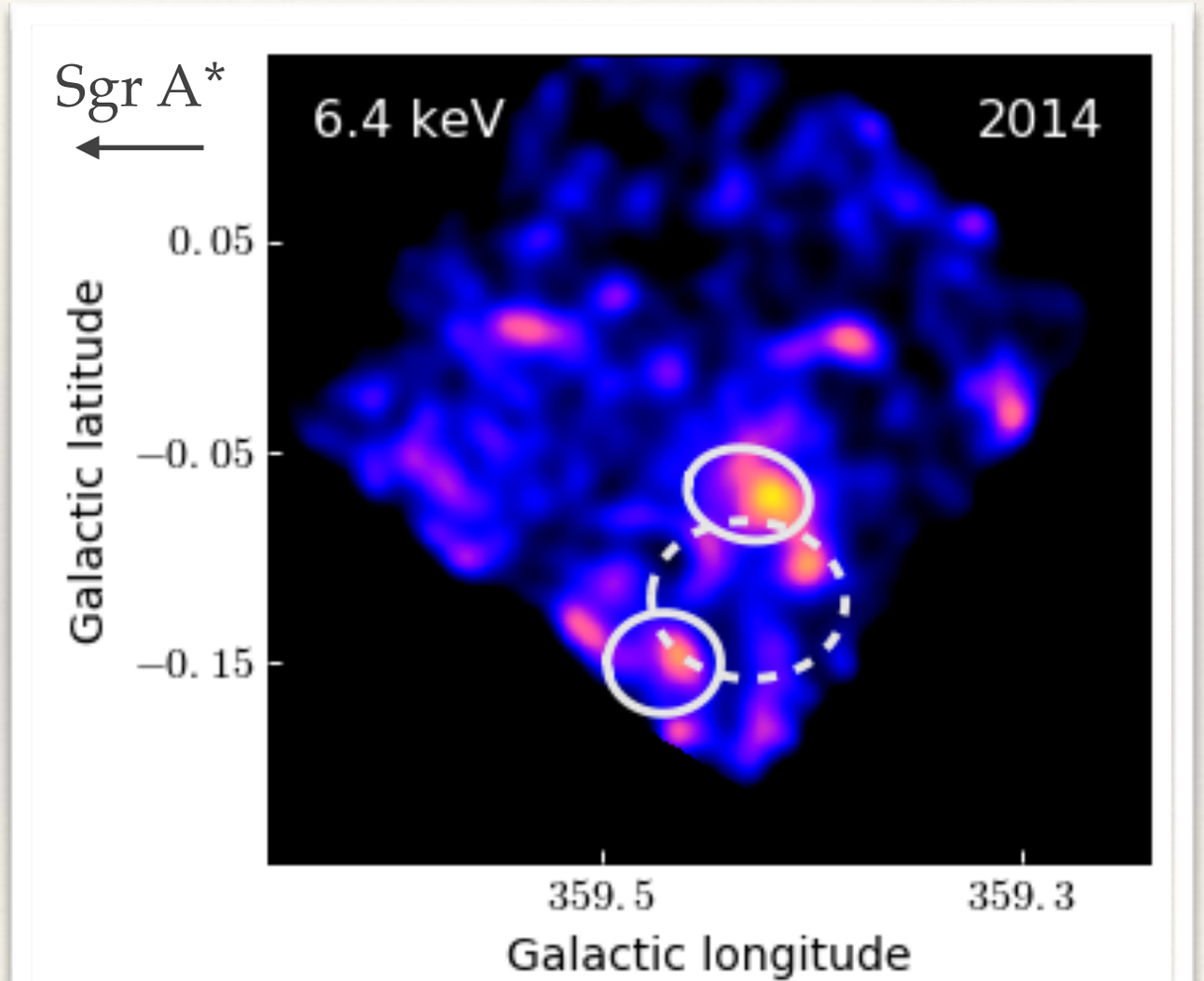
Variability of the non-thermal emission

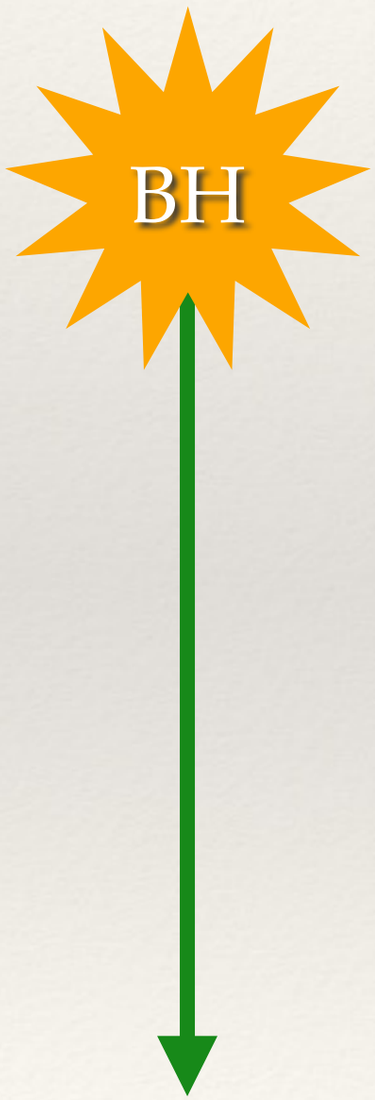


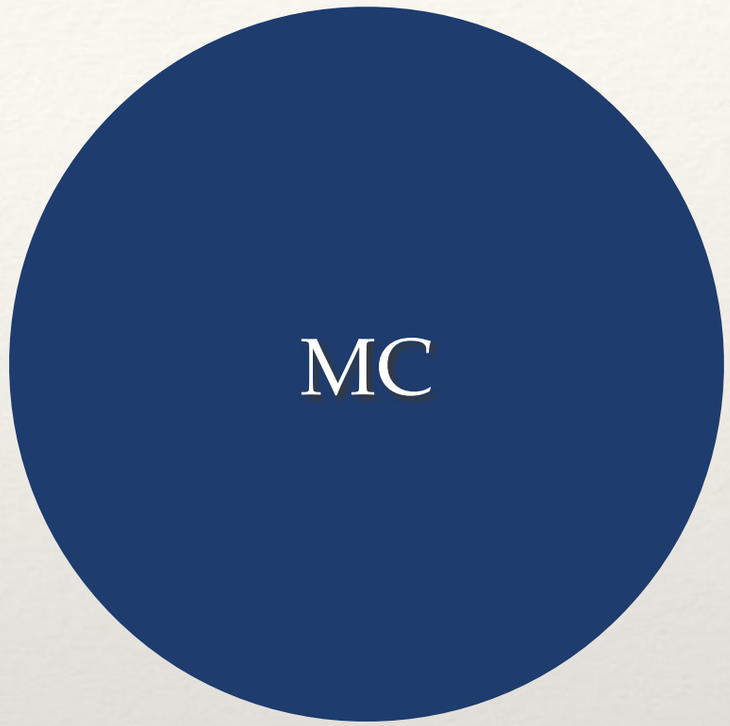
Chandra observations



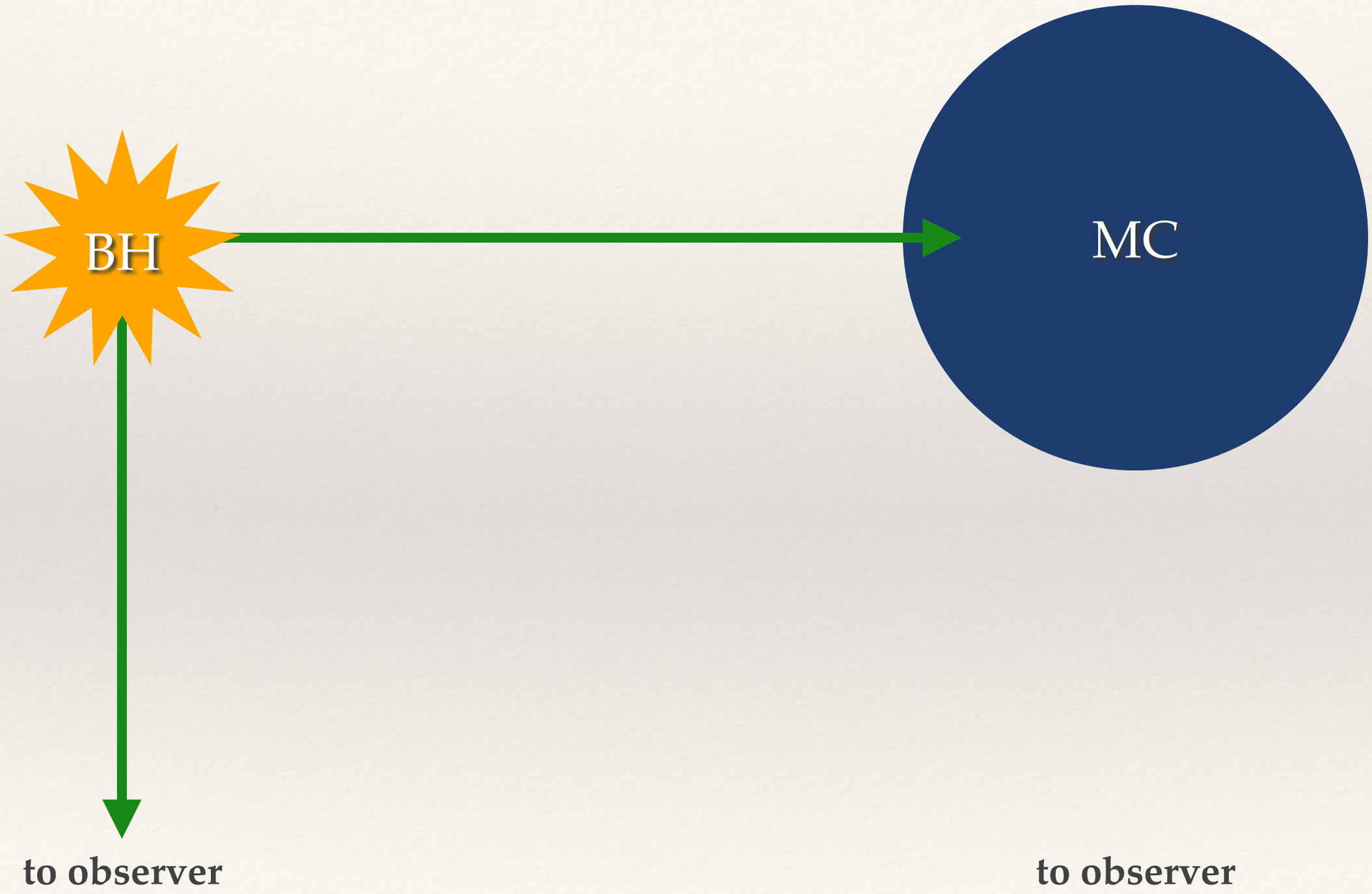
Chuard et al. (in prep.)

X-ray reflection

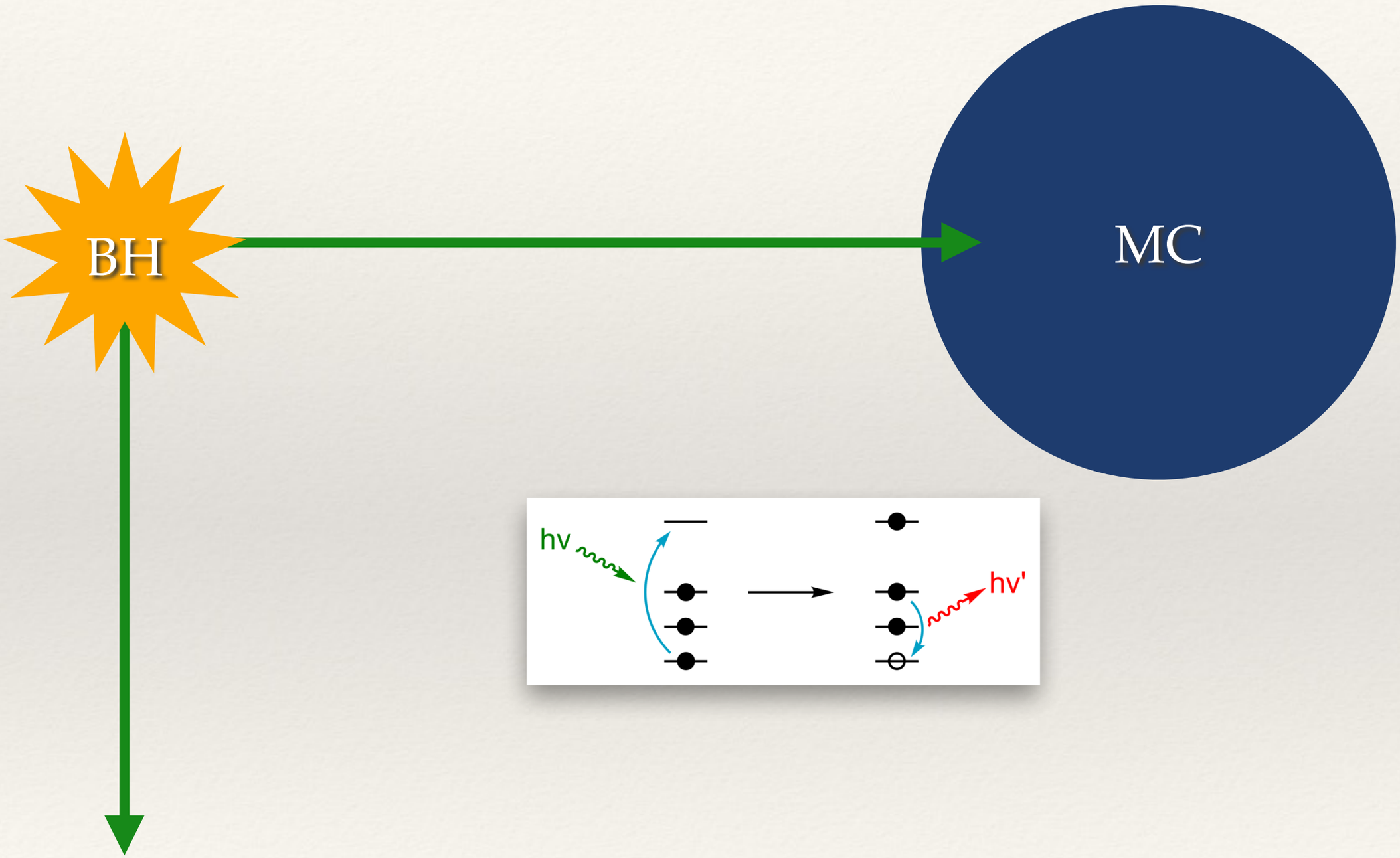




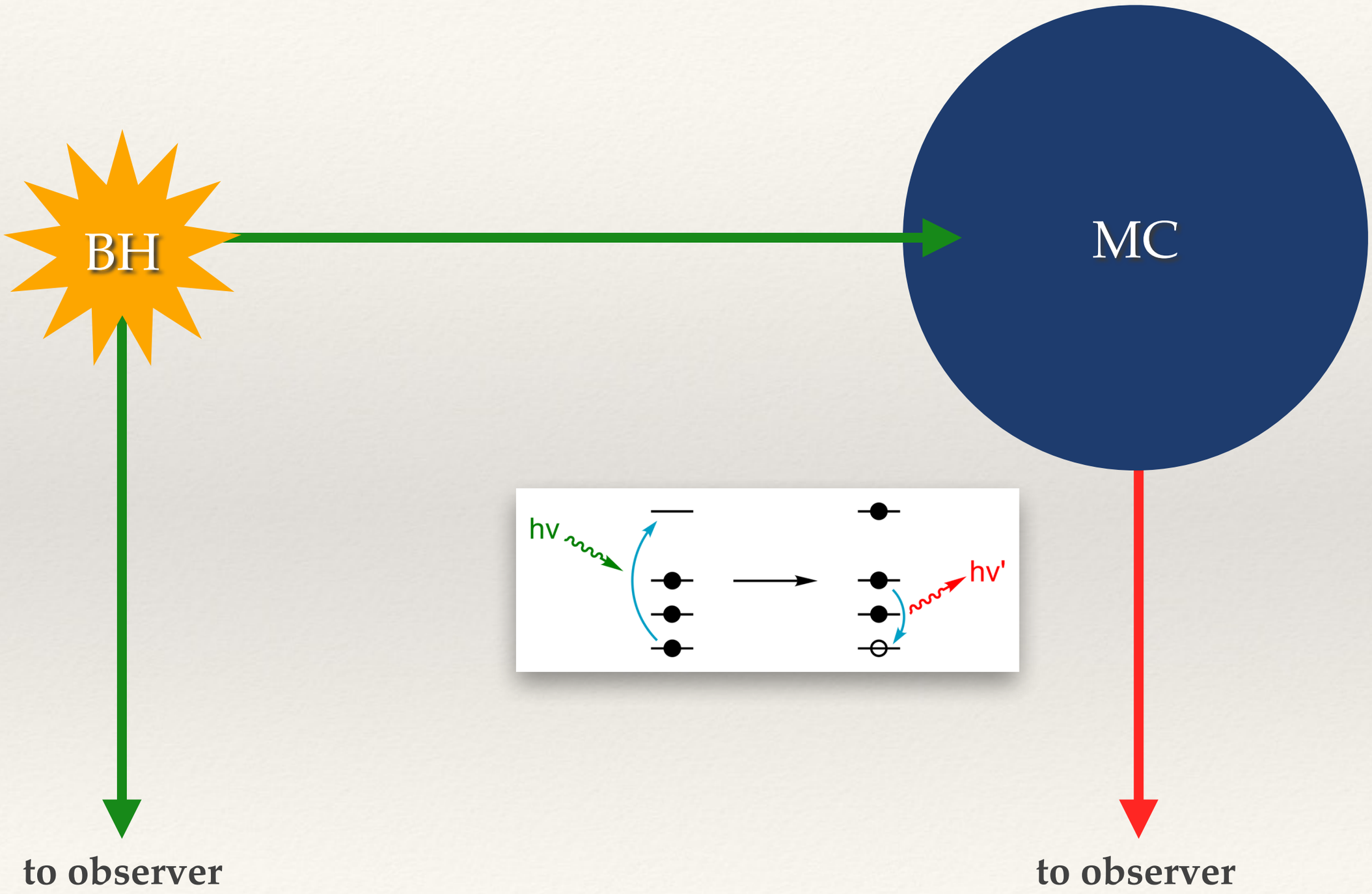
X-ray reflection



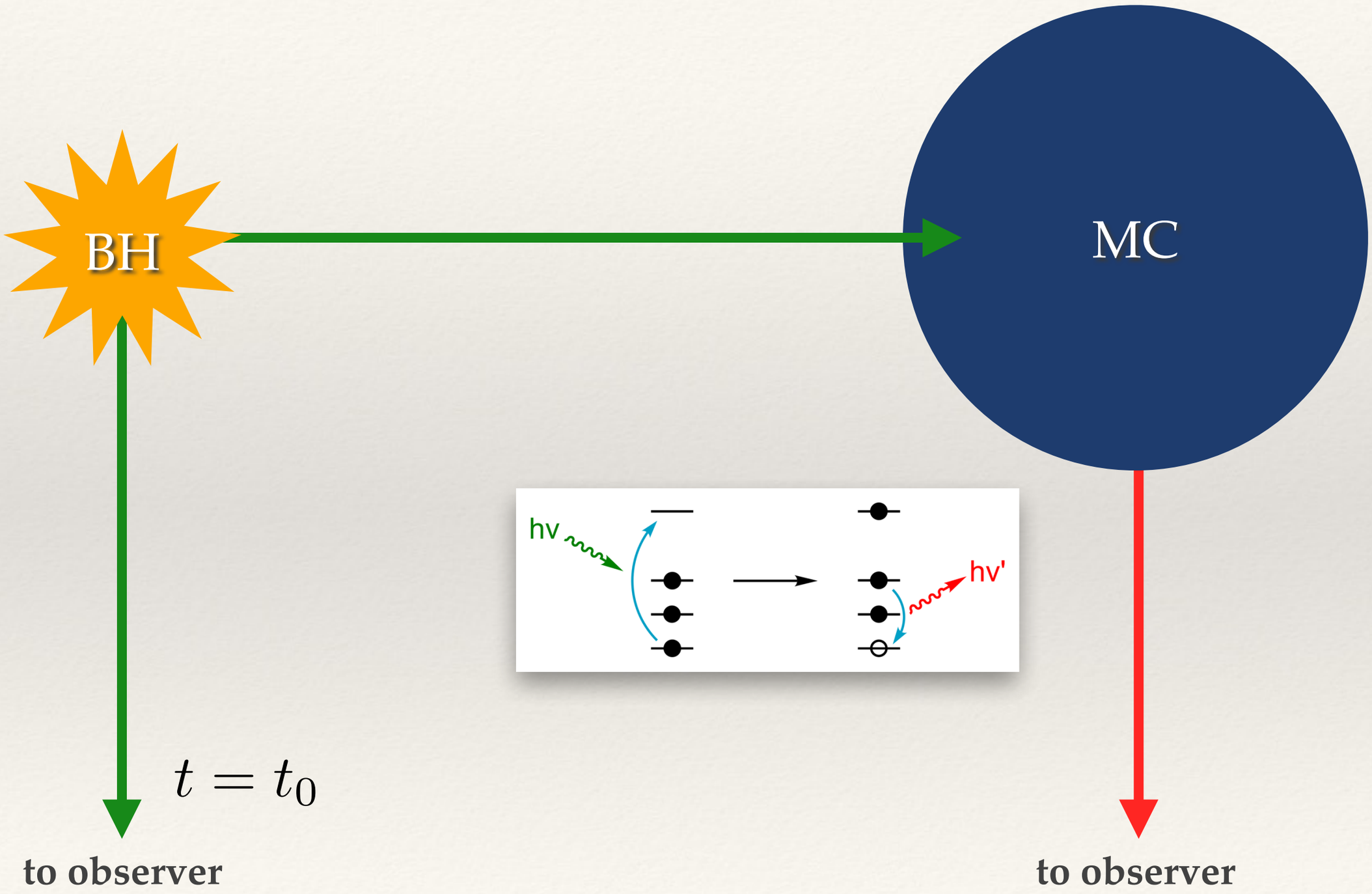
X-ray reflection



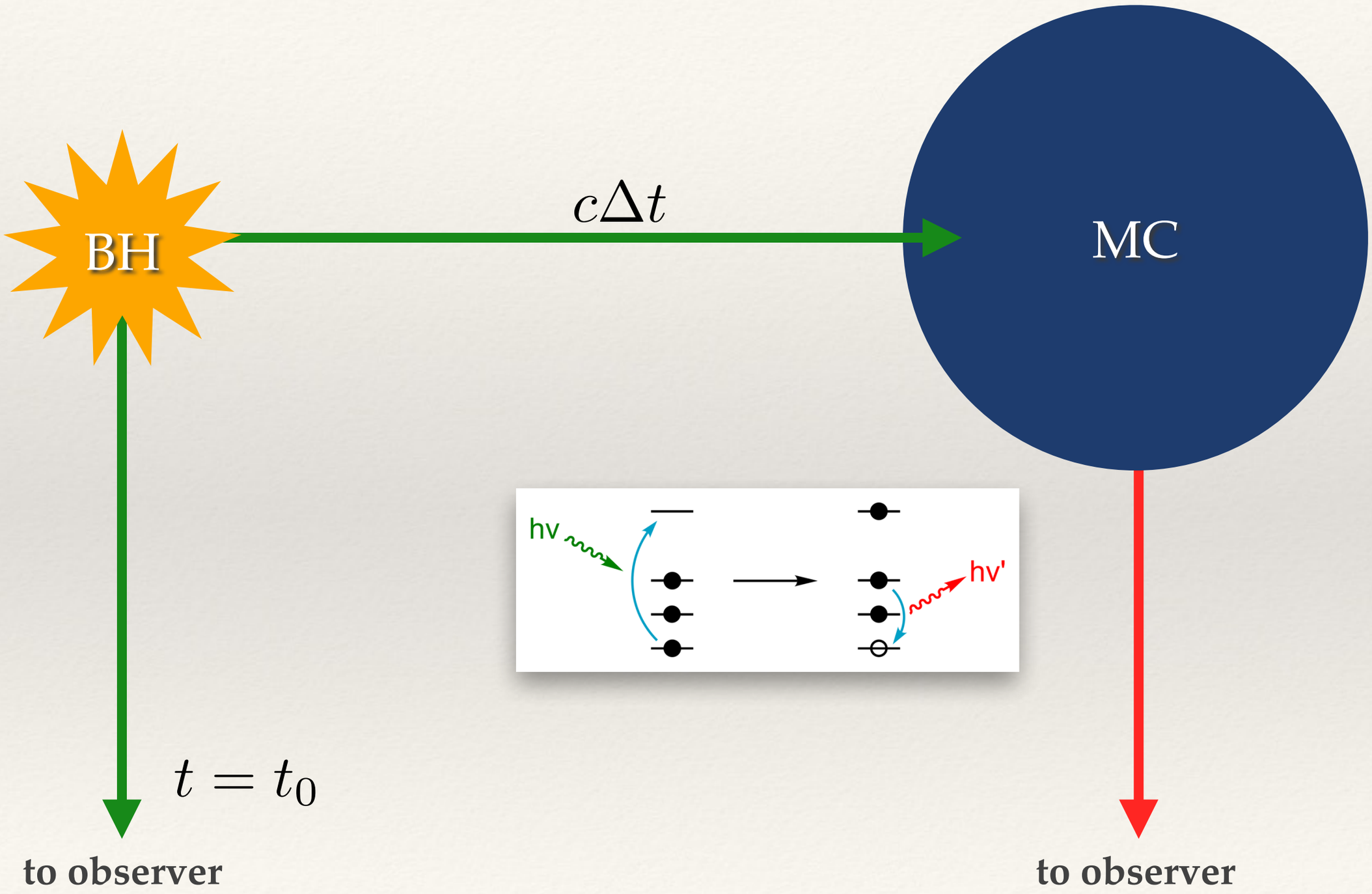
X-ray reflection



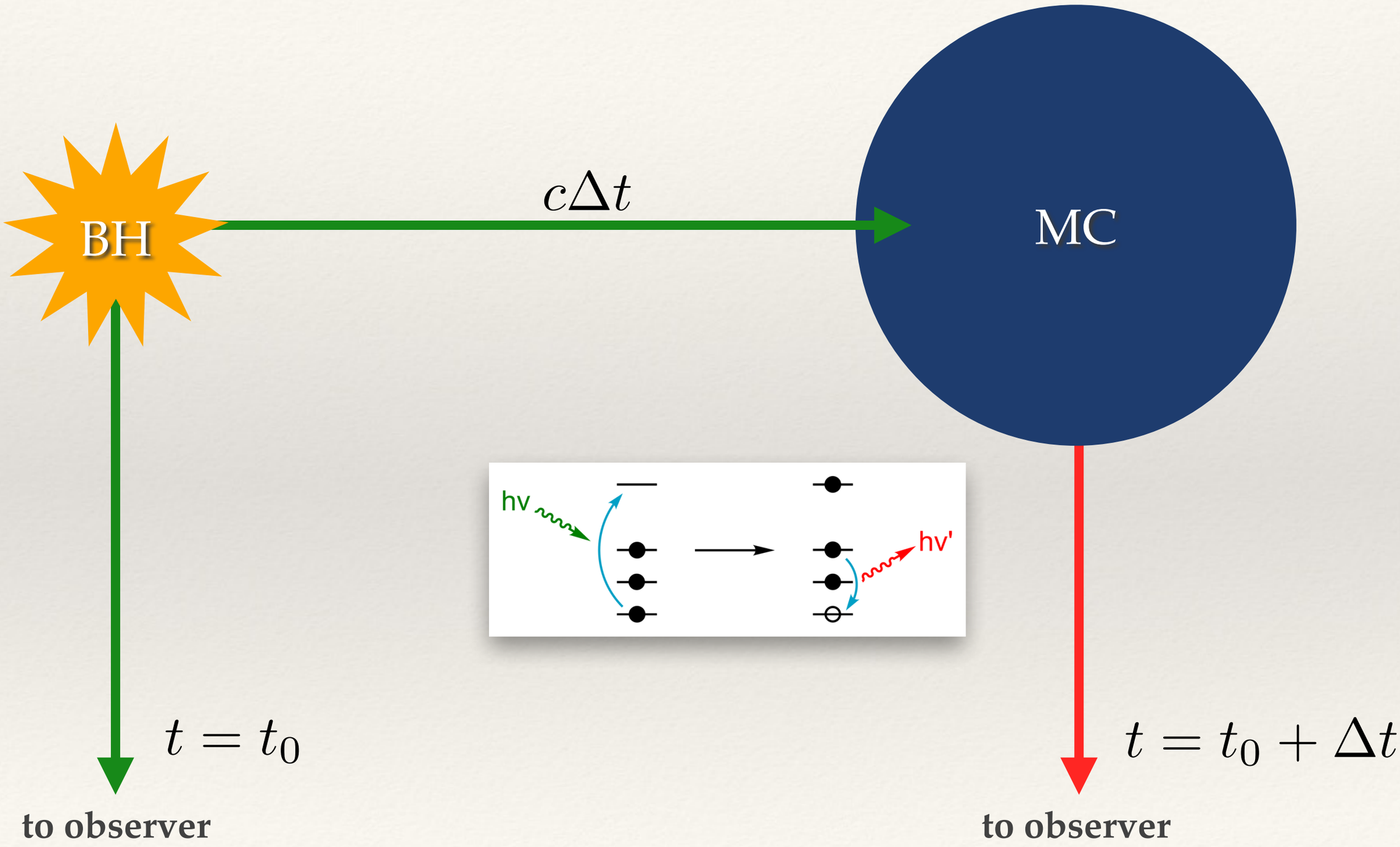
X-ray reflection



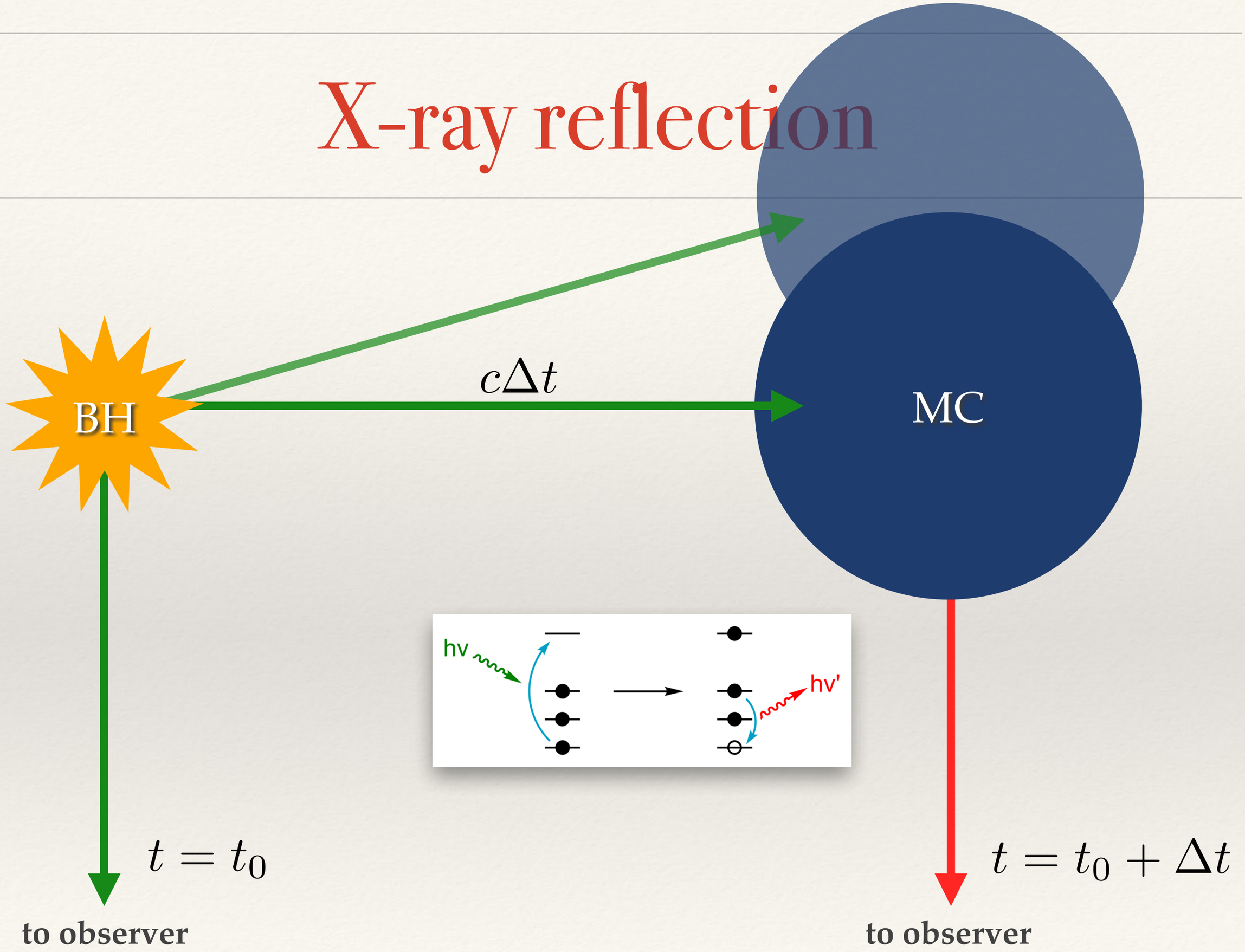
X-ray reflection



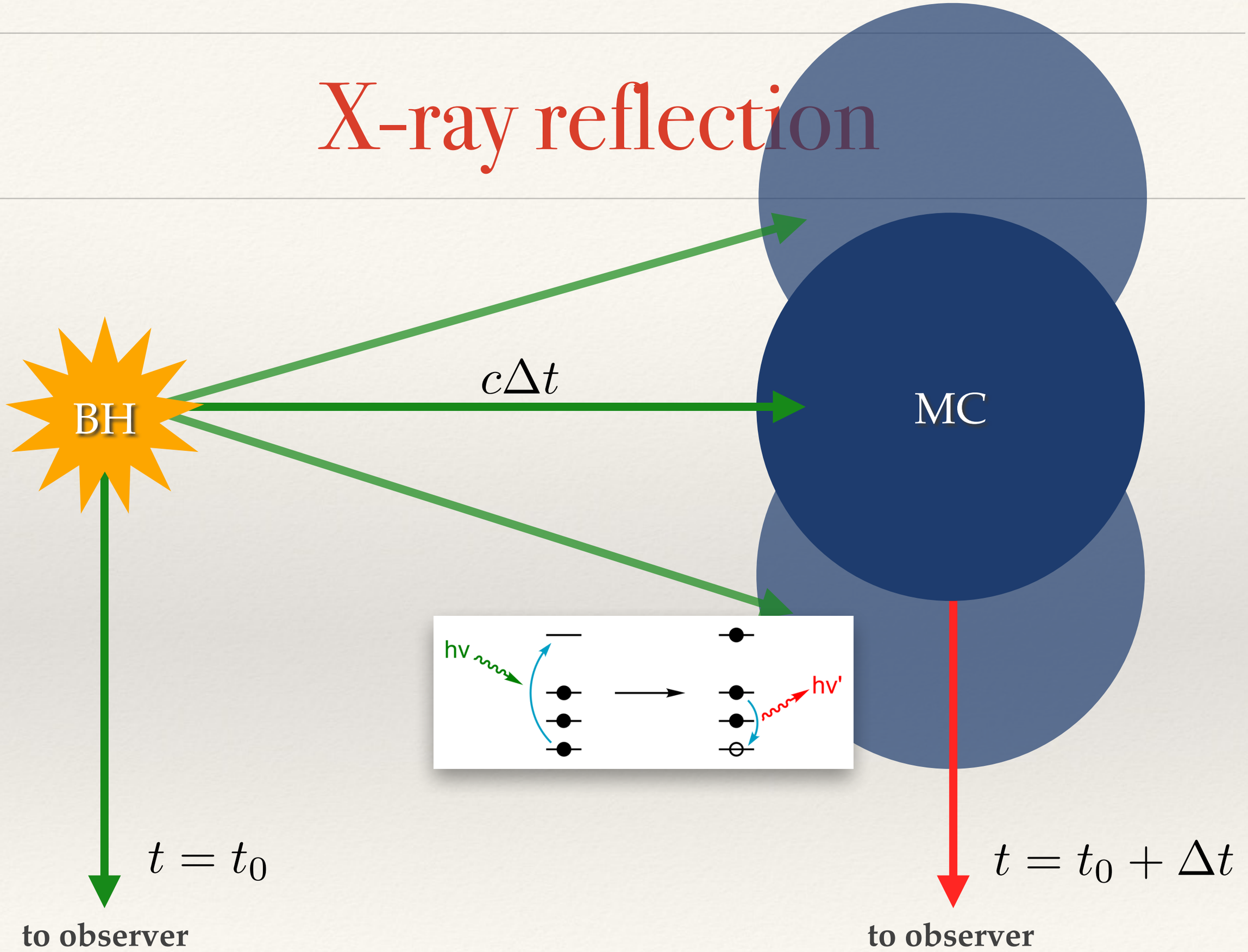
X-ray reflection



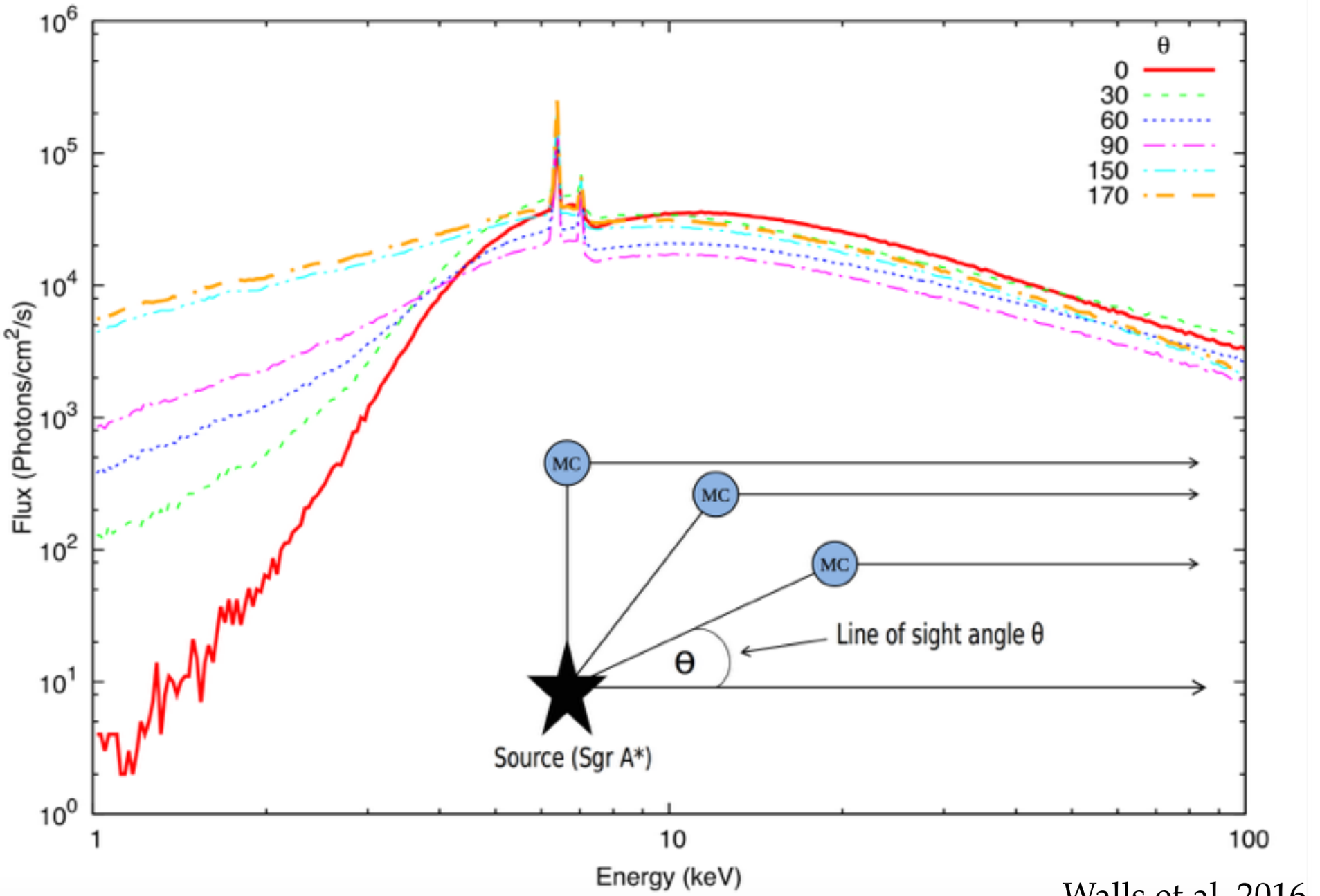
X-ray reflection



X-ray reflection

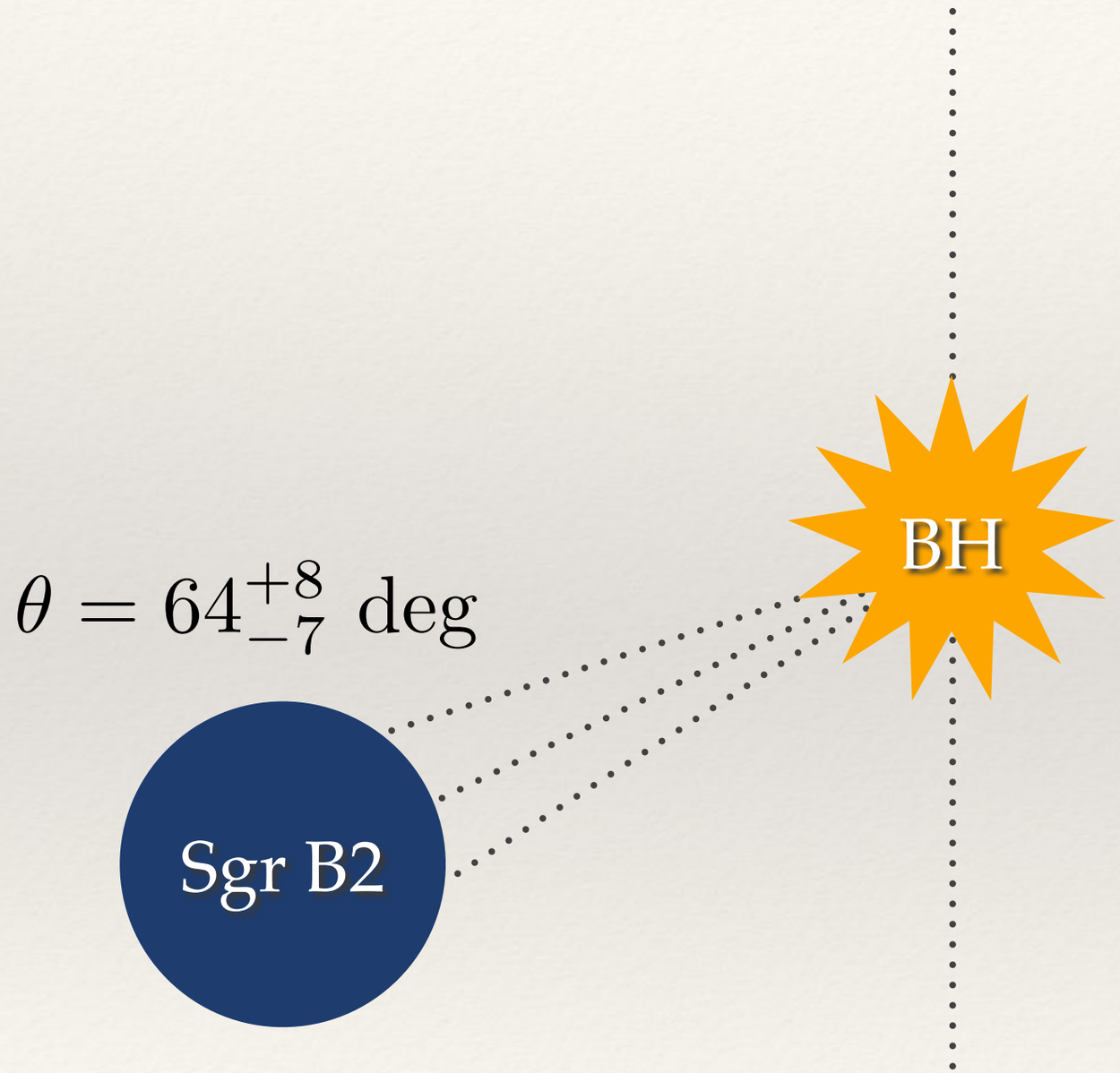


Simulating the reflected spectrum

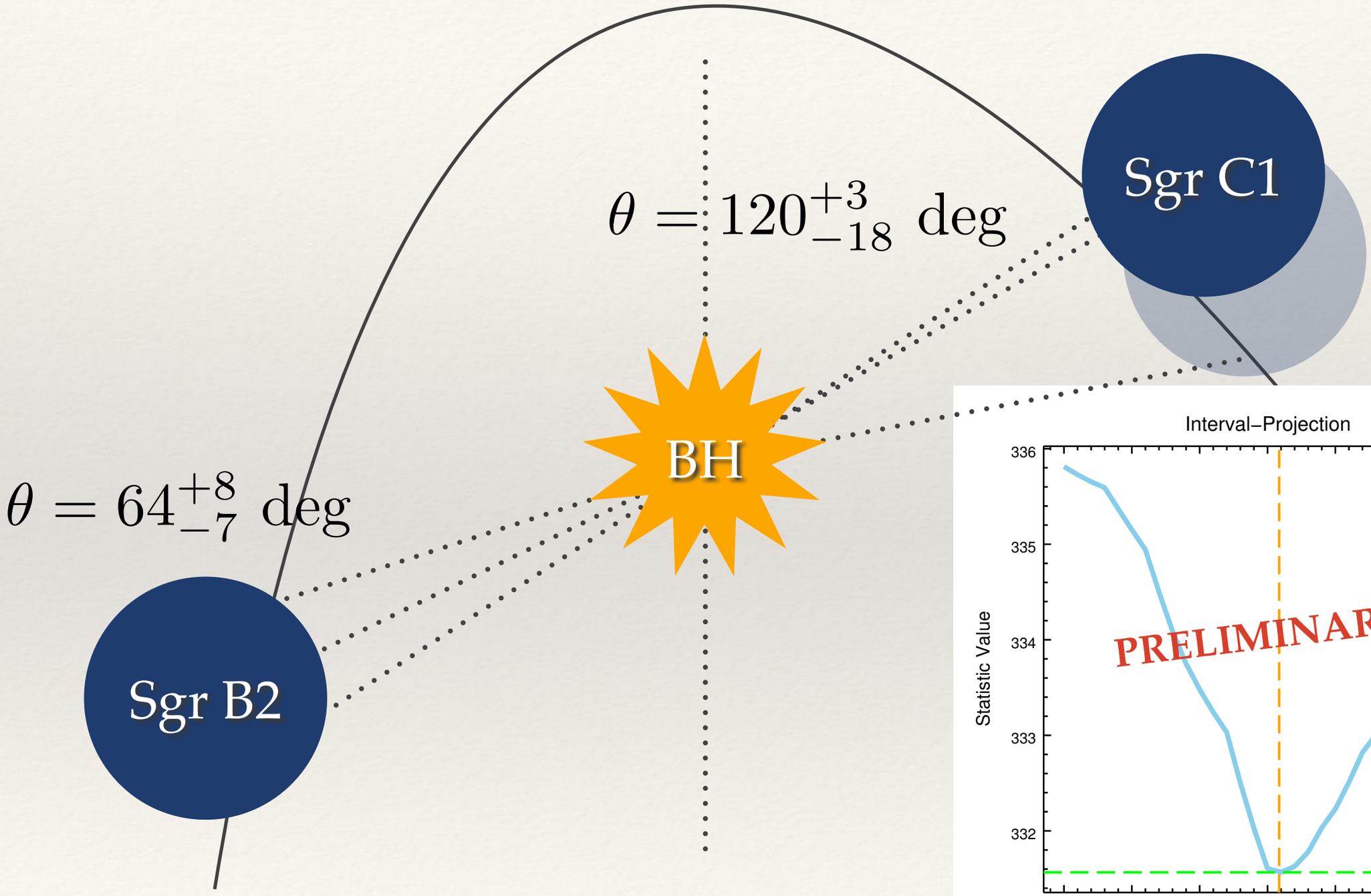


Walls et al. 2016

First results



First results



Take-home message

- The Galactic centre is an incredible place to study high-energy astrophysics: SNR, PWN, BH…
- Reflected spectra can be used to constrain the positions and (hopefully) the past activity of Sgr A*.