

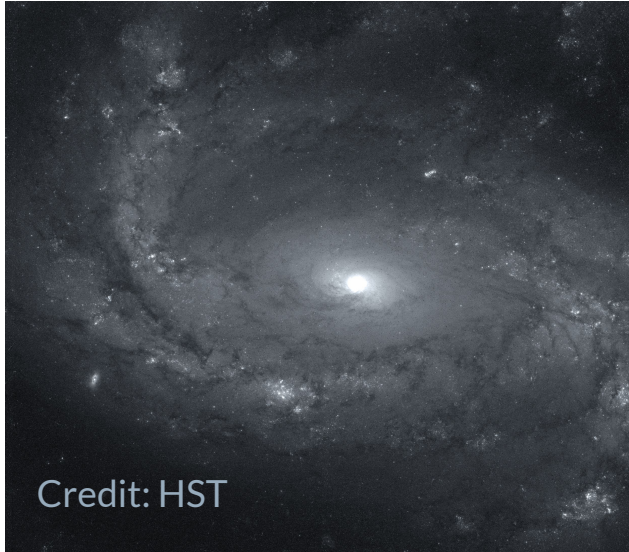
# Constraining the power of X-ray wind in NGC 4051: a Bayesian approach

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# NGC 4051



Some of the longest Chandra  
HETG datasets:

- 700 ks from 2016
- 300 ks from 2008

→  $z = 0.002336$

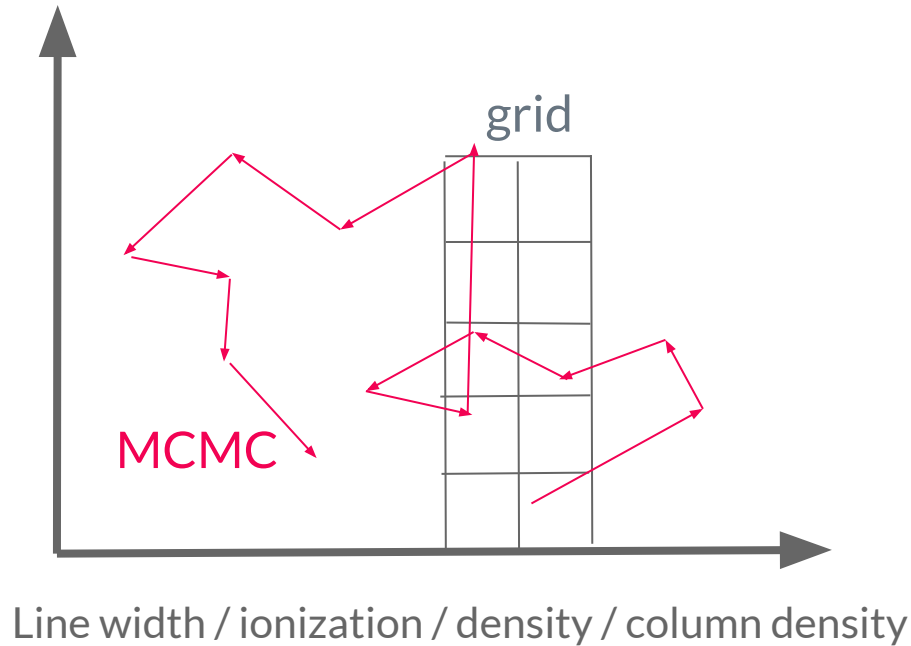
→  $\log(M_{\text{BH}}/M_{\odot}) = 6.13$

→  $L_{\text{BOL}} \approx 2 - 4\% L_{\text{EDD}}$

→ Abundant absorption

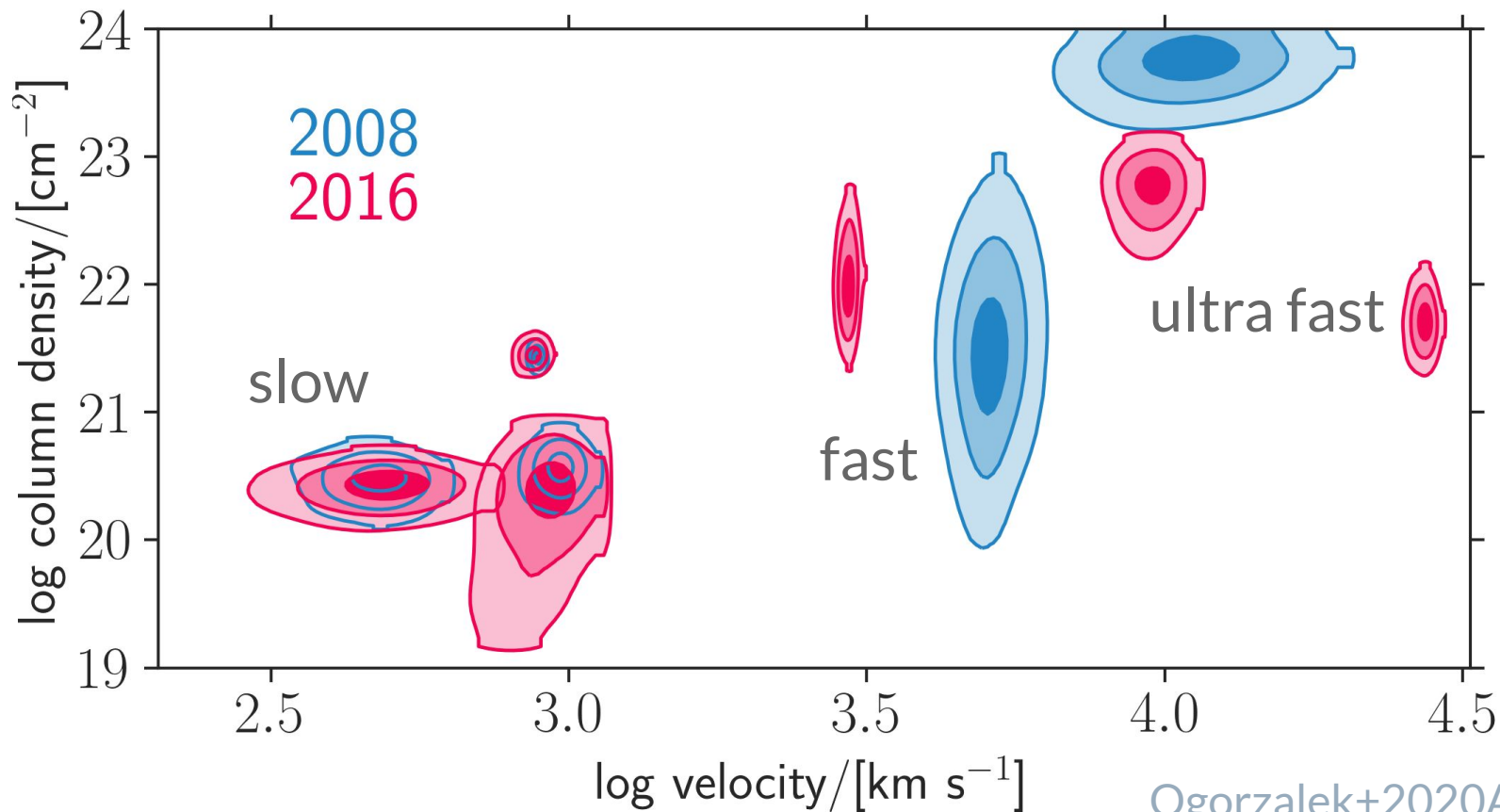
Collinge+01, Krongold+07, Steenbrugge+09, Nucita+10,  
Lobban+11, Pounds+11, King+12, Silva+16, Mizumoto+17

# Bayesian approach

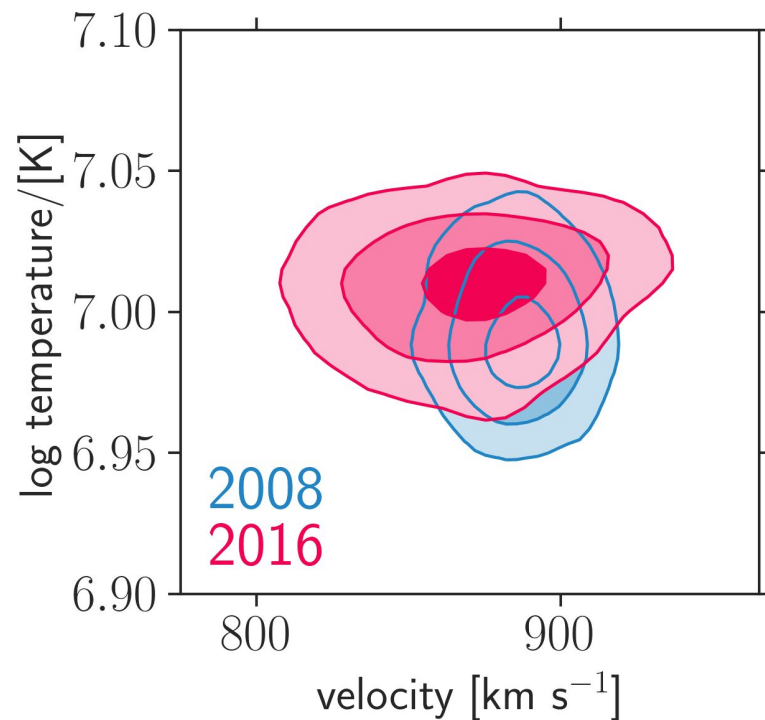
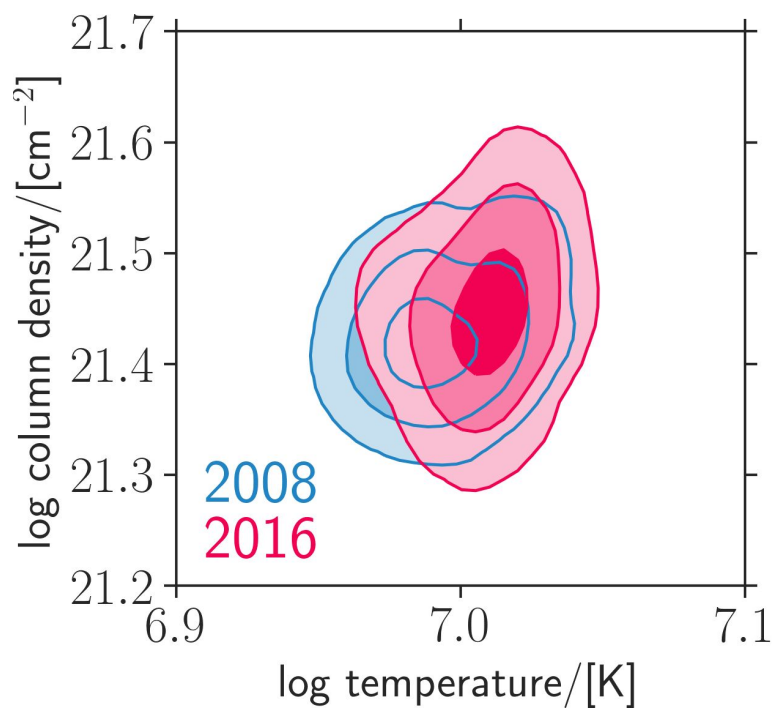


- ▷ Using MCMC
- ▷ Open parameter space
- ▷ Self-consistent
- ▷ **Robust model selection**

# Six absorbers in both dataset



# First detection of a collisional absorber



See also: King+2004,2013; Maksym+2019

Ogorzalek+2020A, in prep.

# Impact on galaxy

- Gas located as close as  $\sim$ few 100s gravitational radii
- Outflow power as high as  $\sim 10\%^*$  of bolometric luminosity  
(\*geometry dependent)

- How to explore parameter space faster for PIE models?
- How to quantify atomic data systematic uncertainty in model-dependent self-consistent fitting?