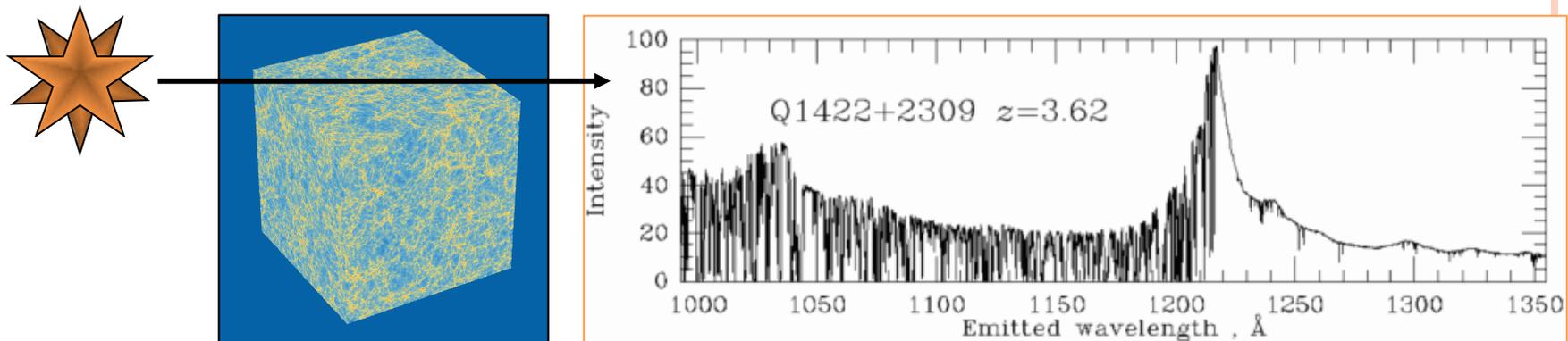


WHY CIV AND SiIV ABSORBERS?

- Trace (net effect of) **cosmic enrichment cycle** with common metals
 - And Si may trace O, which is most common
- Interest in **systems with both doublets** for e.g., ionizing background studies
- Observational niceties:
 - Well-studied with optical telescopes for $1.5 \leq z \leq 5.5$
 - Resonant absorption line doublets
 - Rest wavelengths red-ward of Ly α 1215 (i.e., outside forest, unlike OVI)



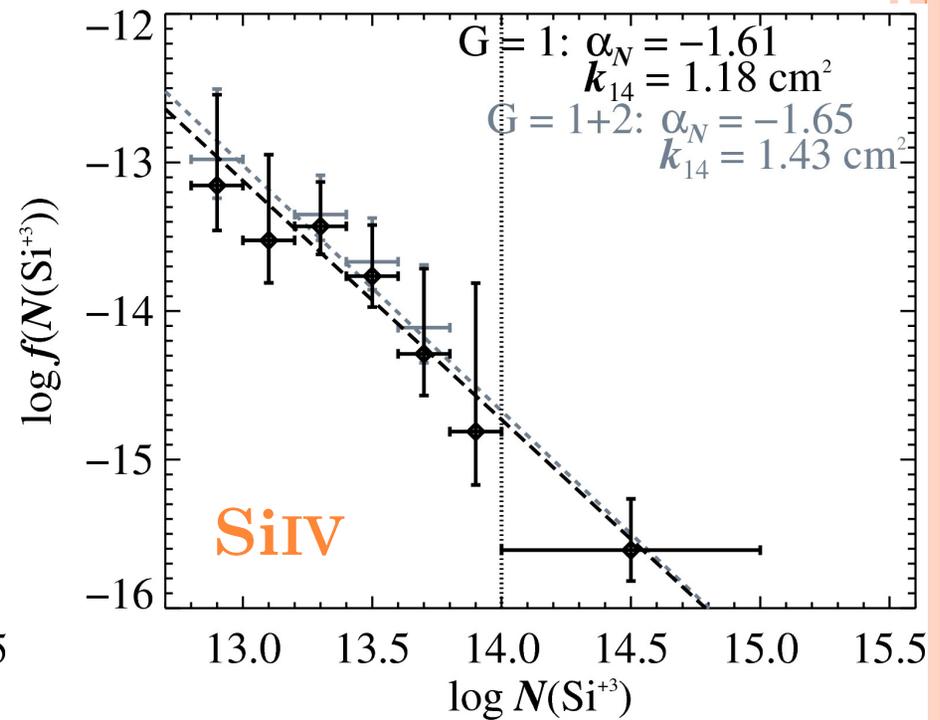
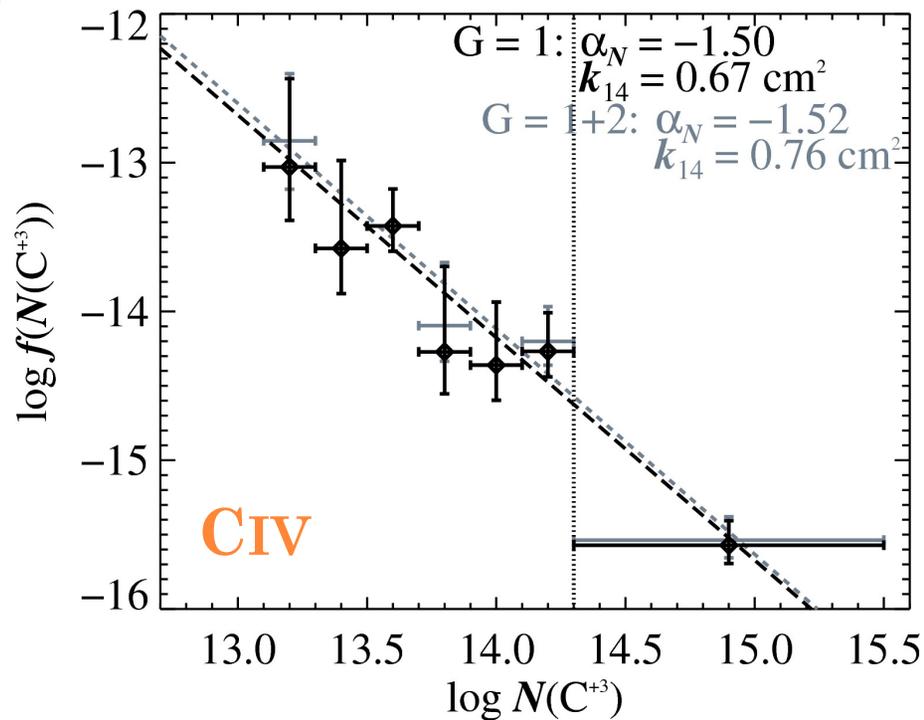
$N(\text{C}^{+3})$ AND $N(\text{Si}^{+3})$ FREQUENCY DISTRIBUTIONS

Definition:

$$f(N(\text{C}^{+3})) \equiv \frac{\Delta \mathcal{N}}{\Delta N(\text{C}^{+3}) \Delta X(N(\text{C}^{+3}))}$$

Power-law model:

$$f(N(\text{Si}^{+3})) = k \left(\frac{N(\text{Si}^{+3})}{N_0} \right)^\alpha$$

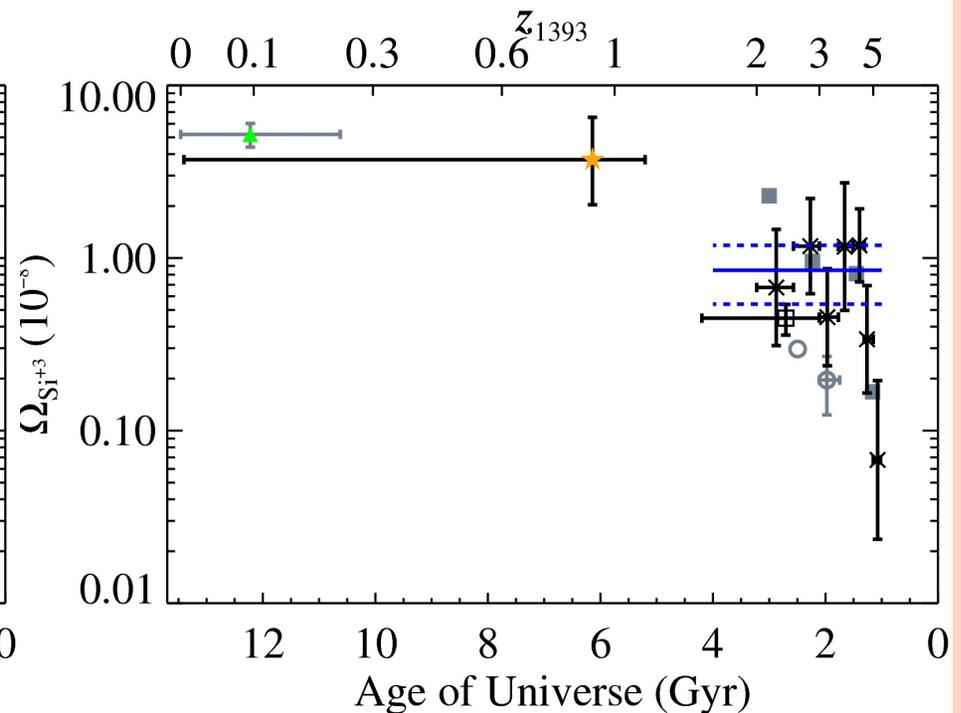
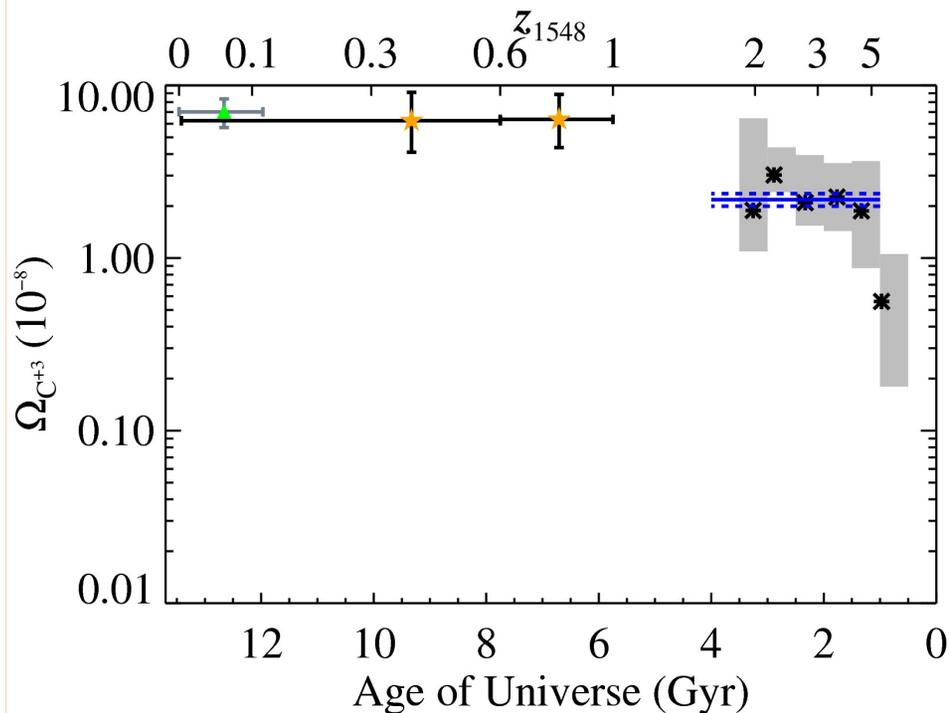


No observed break in $f(N)$.

MASS DENSITIES OVER AGE OF UNIVERSE

C^{+3} : Increases by 4 ± 0.5 over high- z variance-weighted mean.
Rate: $(0.51 \pm 0.16) \times 10^{-8} \text{ Gyr}^{-1}$

Si^{+3} : Increases by $4 + 3 / -1.9$ over high- z unweighted median.
Rate: $(0.61 \pm 0.13) \times 10^{-8} \text{ Gyr}^{-1}$



Songaila 1997, 2001, 2005; Pettini+ 2003; Boksenberg+ 2003; Scannapieco+ 2006;
Danforth & Shull 2008; Becker+ 2008; Ryan-Weber+ 2009; Cooksey+ 2010, 2011