THE PREVALENCE OF CIII EMISSION AT $1.5 < z < 4$

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The current state of high-z studies

- Hundreds of photometric candidates at $z > 5$ from CANDELS, HUDF, BoRG, etc.
- But relatively few spectroscopic confirmations from Ly-α or continuum breaks

![Graphs showing data from Oesch+16 and Oesch+15]
We usually do OK with the brightest ones, but…
What’s going on at high-z?

- Increasingly neutral IGM at $z>6$ leads to increased scattering of Ly-α photons (Stark+11, Pentericci+11, Treu+13, Dijkstra+14, …)

$M_{UV} < -20.25$

$X_{Lyα,25}$

$z$

4 5 6 7 8 9

Stark+16
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- (New results indicate that this may not be true around the most extreme galaxies)
CIII: the best thing since Ly-α?

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- Photoionization models $\rightarrow$ high electron temperatures and ionization parameters, low metallicity
  - “Easier” to interpret than Ly-α

\[ \text{Shapley+03 (z~3 LBG stack)} \]
Samples of CIII are small and targeted

- Focused on local/low-mass populations (e.g. Stark+14, Zitrin+15, Rigby+15)
- Typically from targeted long-slit spectra
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MUSE spectroscopy

- MUSE at the VLT
- $R \sim 3000$
- 4650-9300 Å
- 1’x1’ Integral Field Unit
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- 20 hours in the UDF (GTO)
- 27 hours in the HDF-S (Bacon+15)

- SB limit: $10^{-19}$ erg/s/cm$^2$/arcsec$^2$
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- Source detection in MUSE narrow-band images for line-dominated objects (Richard+15)
- Line fluxes and EWs determined with platefit (Tremonti +14, Brinchmann+14)
- Redshifts for other sources from 3D-HST grism spectroscopy (UDF only) or photometry
37 CIII emitters from $1.5 < z < 4$
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- 38% ($17/45$) of $m814 < 26$ galaxies at these $z$'s have CIII detection
Are the CIII emitters intrinsically different?

- Compare e.g. SED-derived quantities (MAGPHYS – da Cunha+08)
Are the CIII emitters intrinsically different?

- Relation between LUV and CIII luminosity tentative
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- Brighter Ly-α and continuum, but no additional UV lines compared to LAEs
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- Brighter optical emission lines (OIII, Hβ, OII; from 3D-HST in UDF) → brighter CIII
Conclusions and Outlook

- Sample of 37 $1.5 < z < 4$ CIII emitters down to $10^{-19}$ erg/s/cm$^2$/arcsec$^2$
- Will be supplemented by:
  - Deeper UDF pointing (up to 80h)
  - 9 additional MUSE pointings in UDF to 10h depth
  - ...

In general, CIII emission visible in
  - (UV-) brightest galaxies
  - Objects with strong optical emission lines