

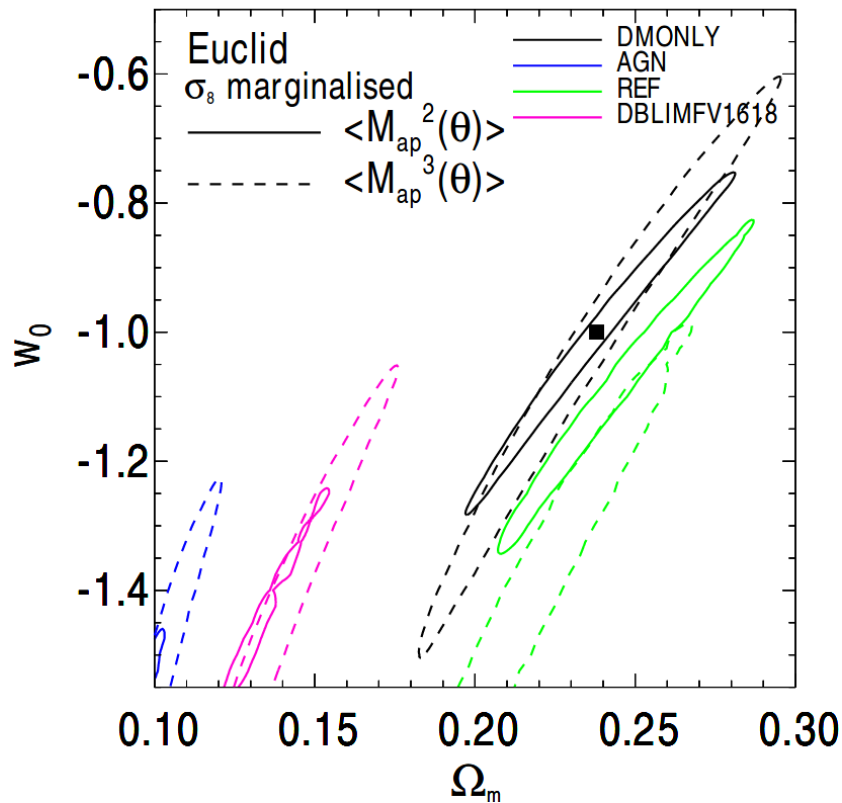
# Feedback impact on dark matter and cosmology

Matthieu Schaller

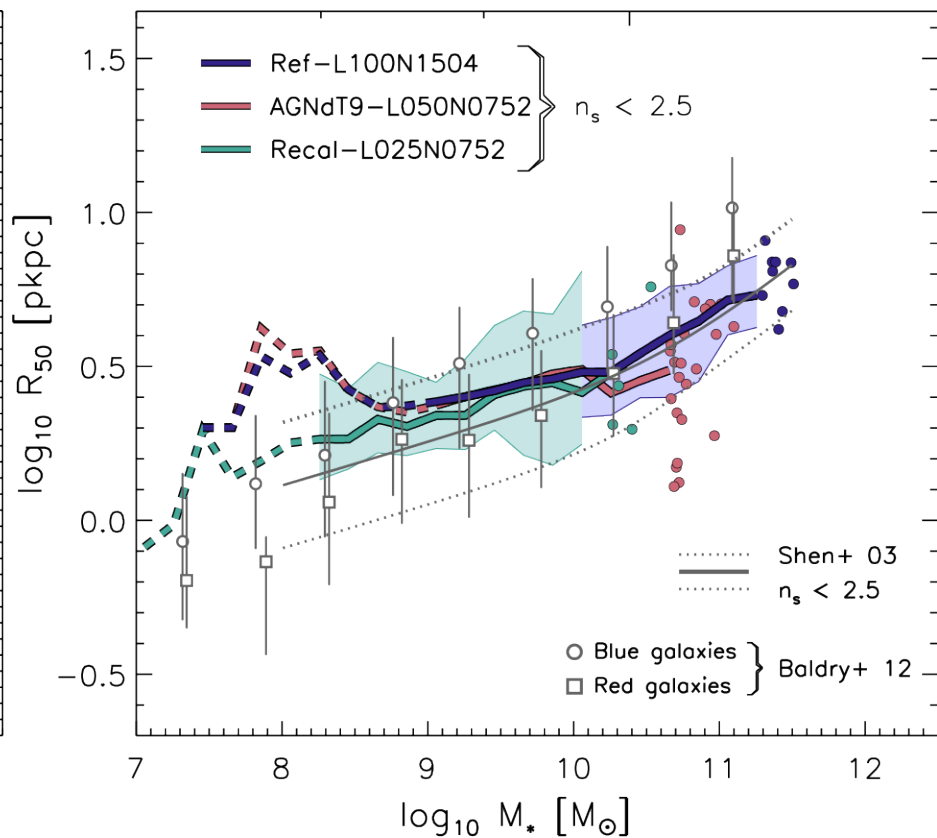
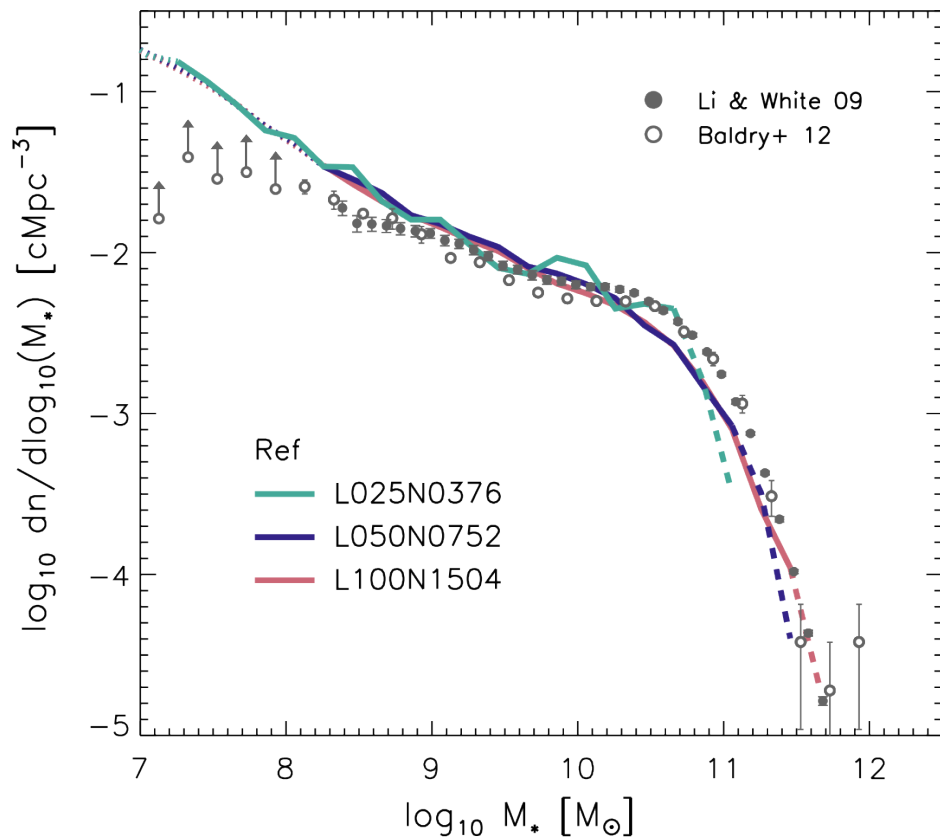
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Leiden Observatory

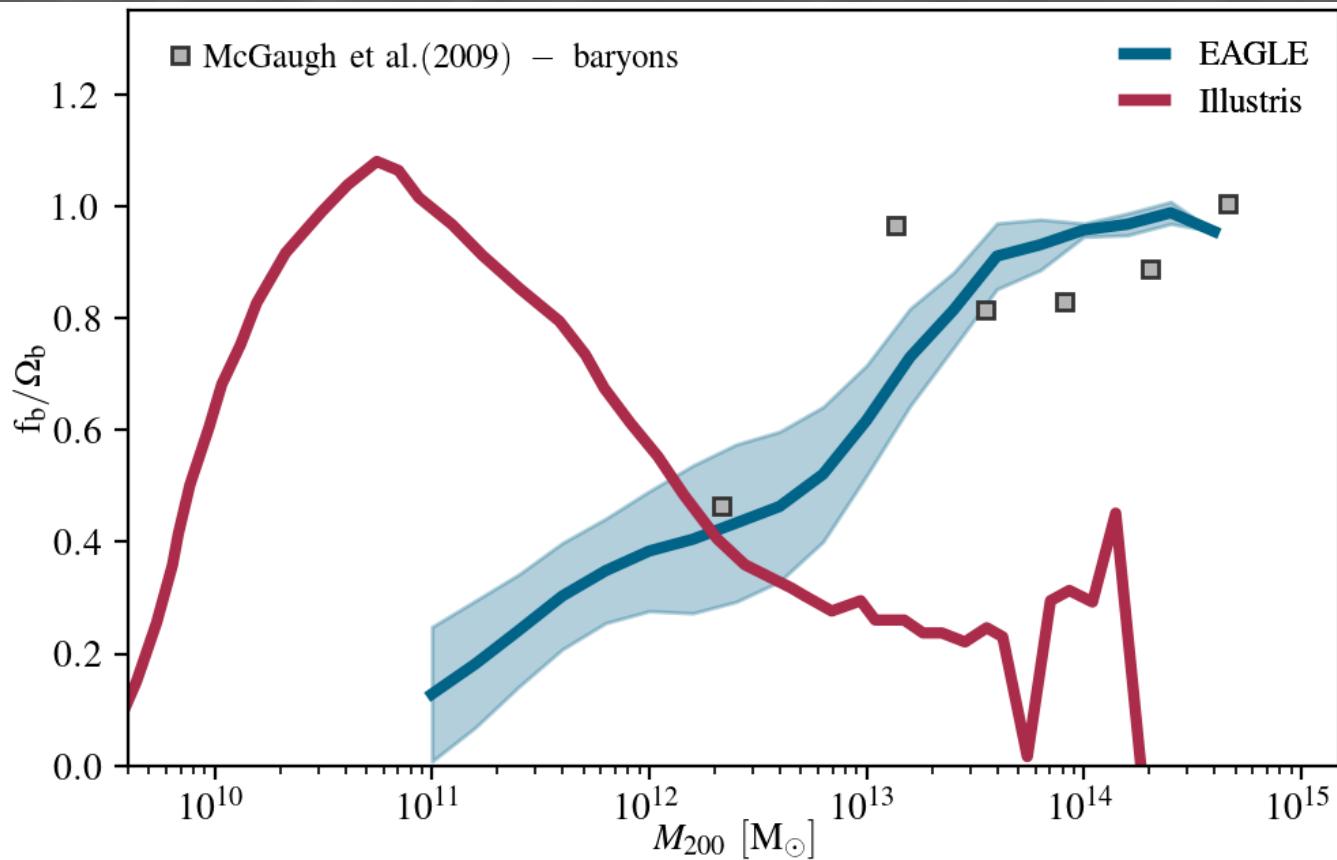
# Weak-lensing cosmology



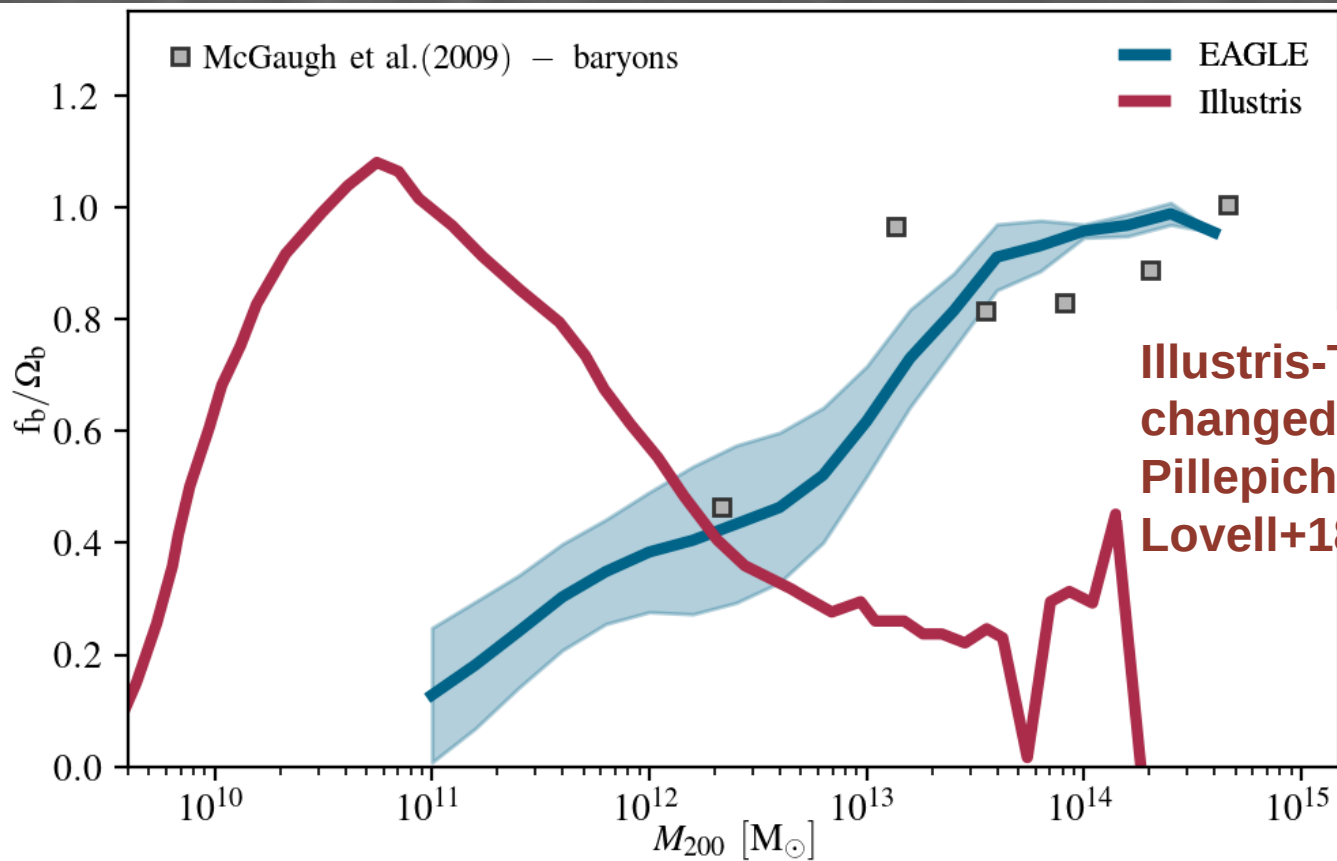
# EAGLE calibration target



# HaLo baryon content?

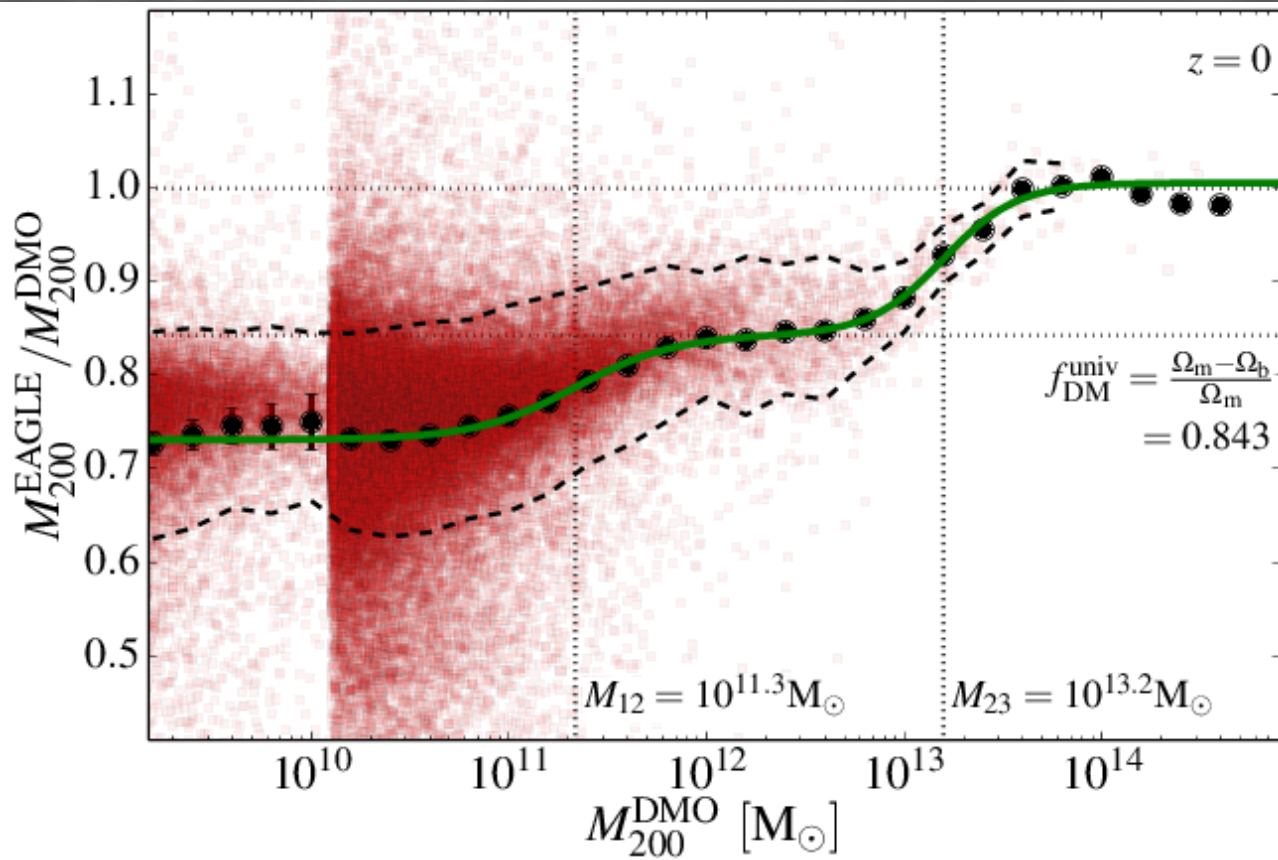


# HaLo baryon content?

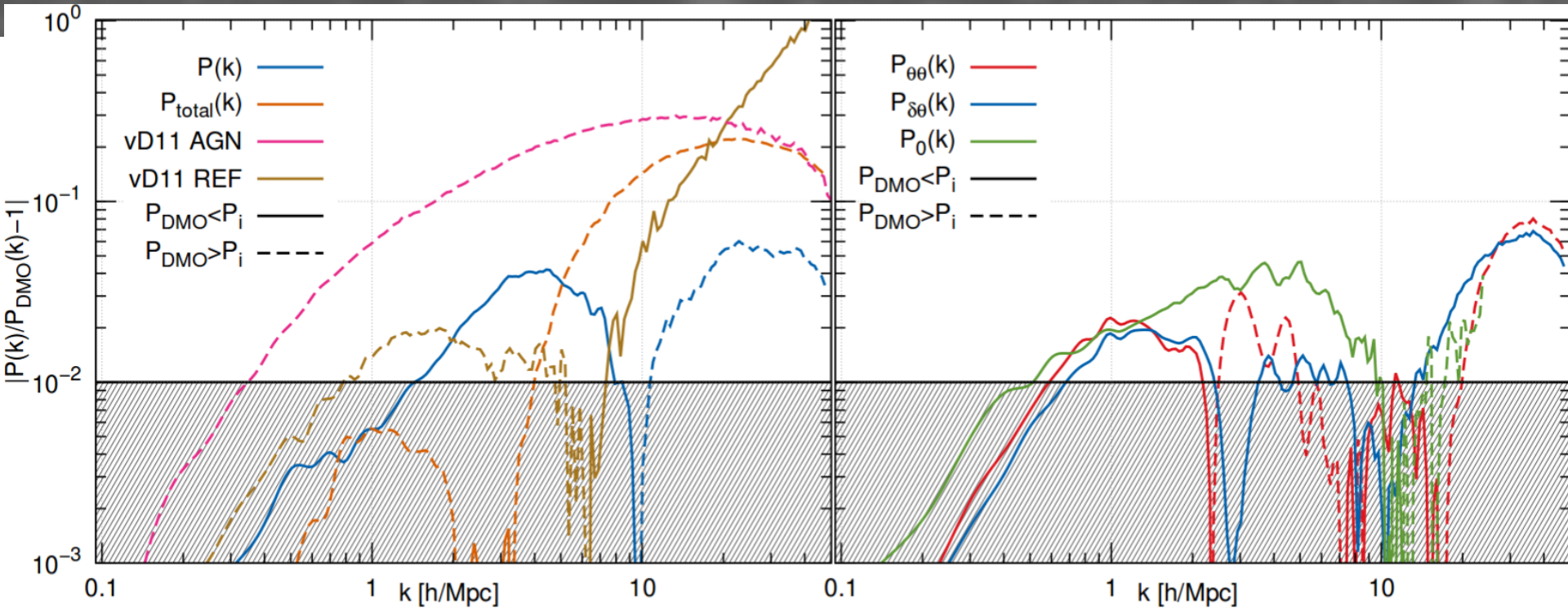


**Illustris-TNG  
changed a lot. See  
Pillepich+17 and  
Lovell+18**

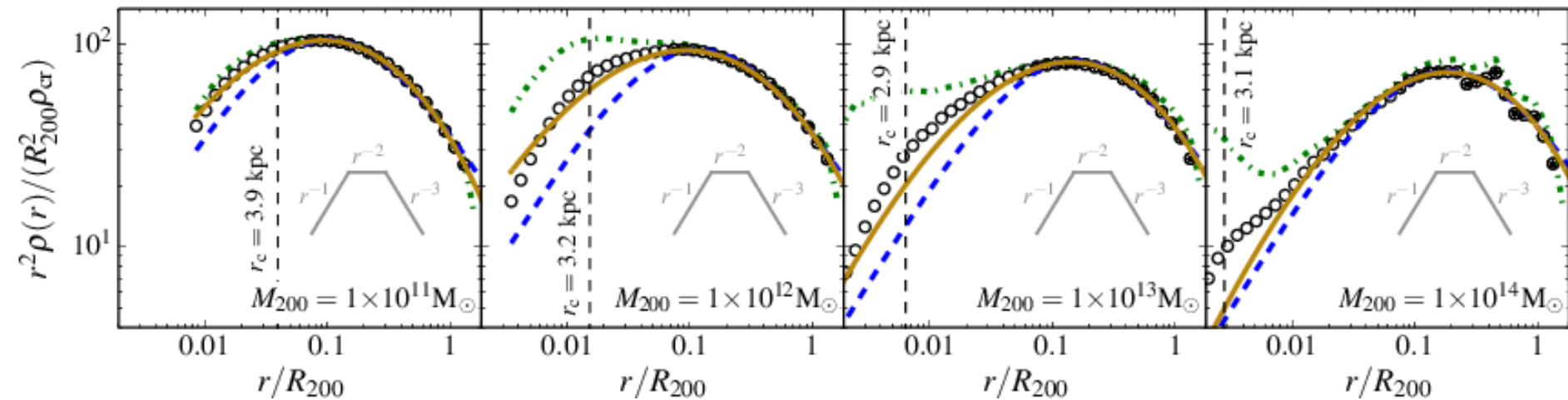
# Effect on halo mass



# In terms of power-spectrum



# Effect on profiles





**Looking at clusters**

# Hydrangea / C-EAGLE

30 halos randomly selected in log-spaced mass bins.

Mass range:  $M_{200} = 10^{14} - 10^{15.5} M_{\odot}$ .

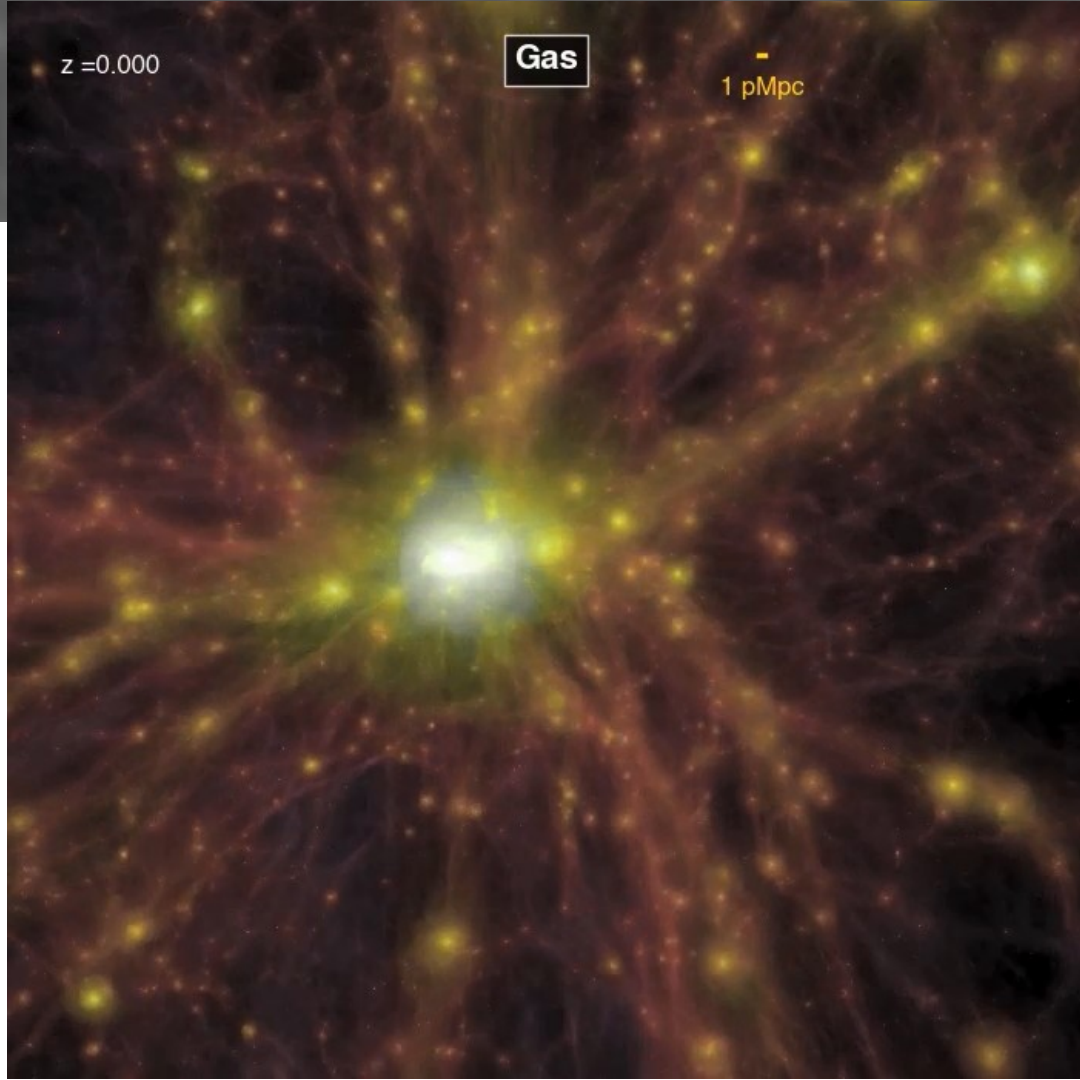
Simulate a region up to  $10 R_{200}$  ( $\sim 25$ Mpc).

Chosen to be relatively quiet by  $z = 0$ .

$z = 0.000$

Gas

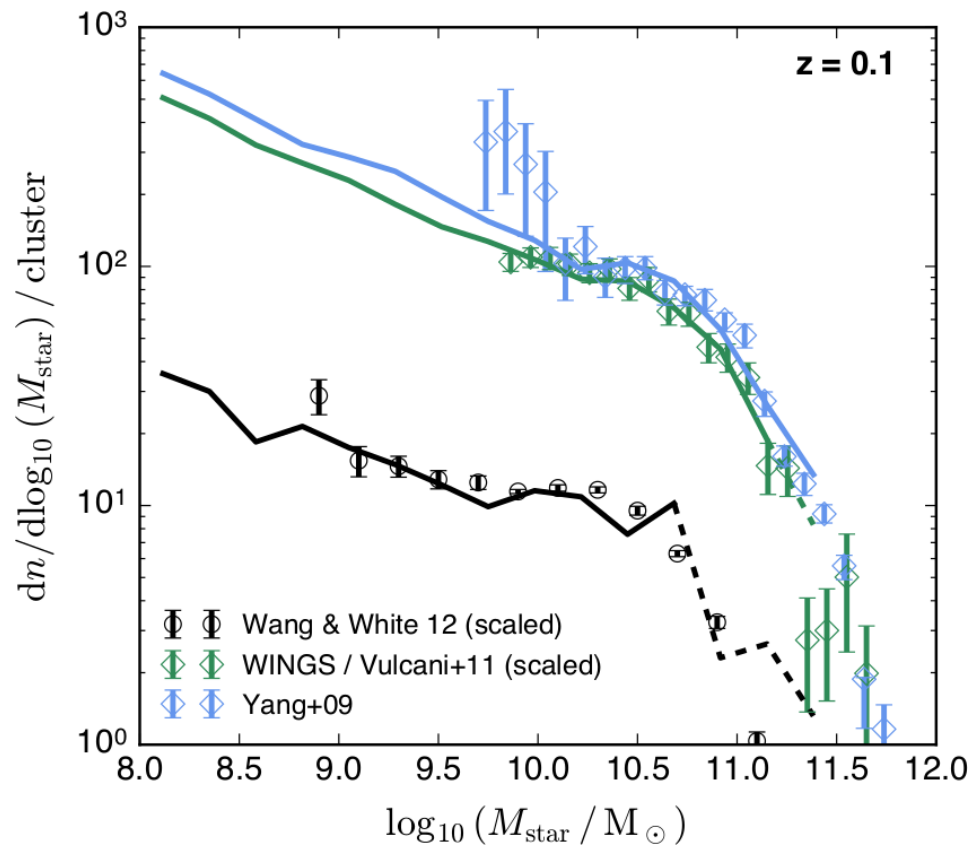
1 pMpc



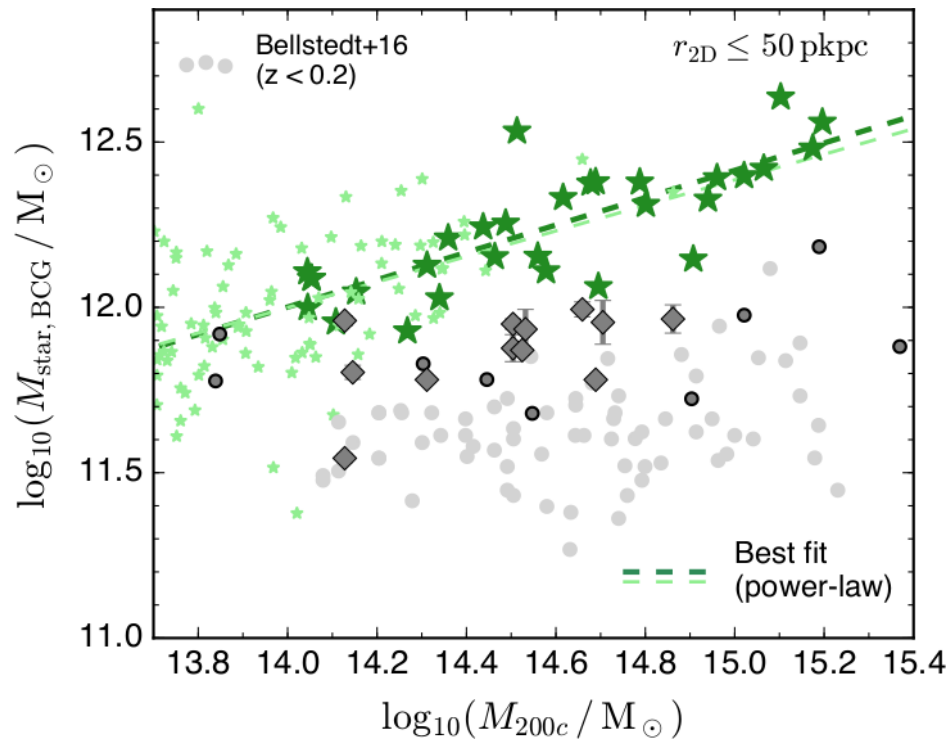
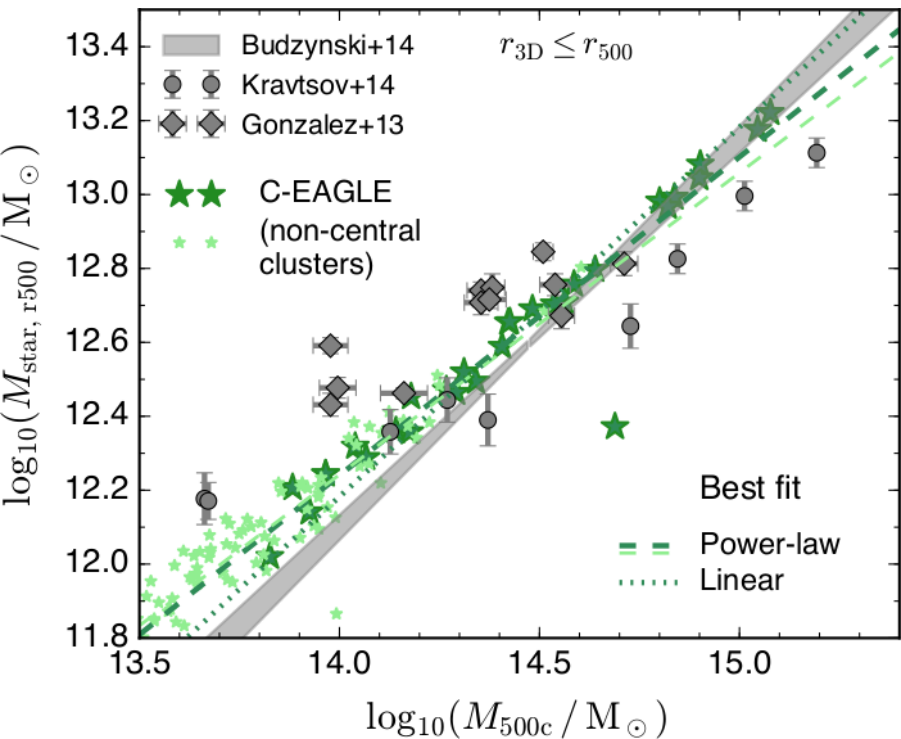
# HaLo 29 - some properties

- Radius  $R_{200}$ : 2.8 Mpc
- Spectroscopic temperature: 7.7 keV
- Soft X-ray luminosity:  $8.8 \times 10^{44}$  erg / s
- 826 galaxies with mass  $> 10^9 M_{\odot}$

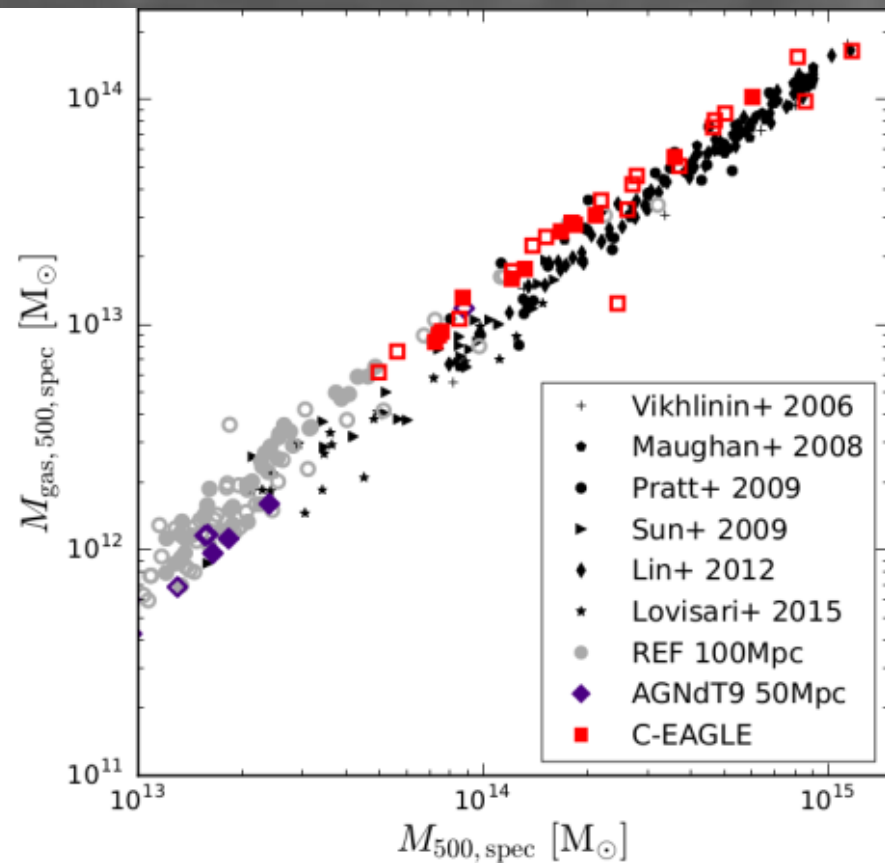
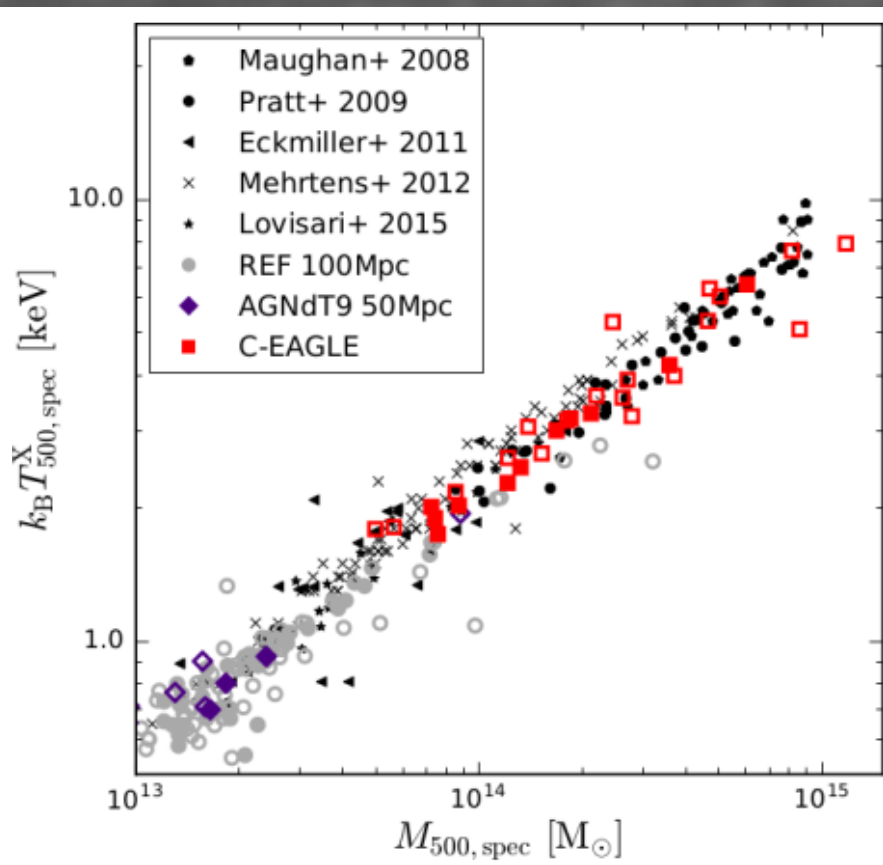
# Satellite mass function



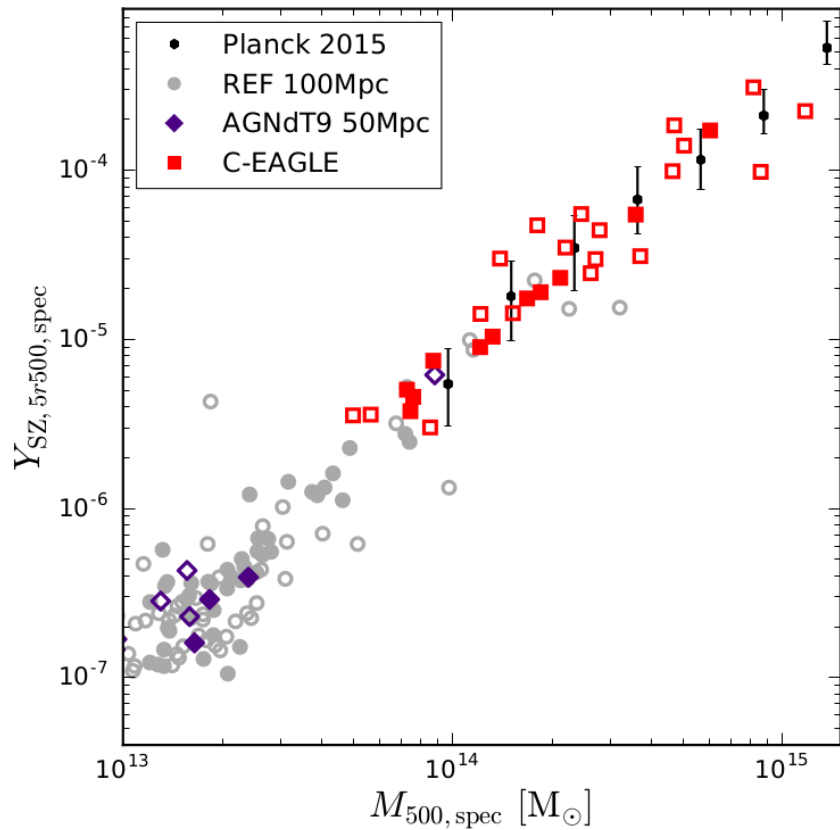
# Something not that good: BCG



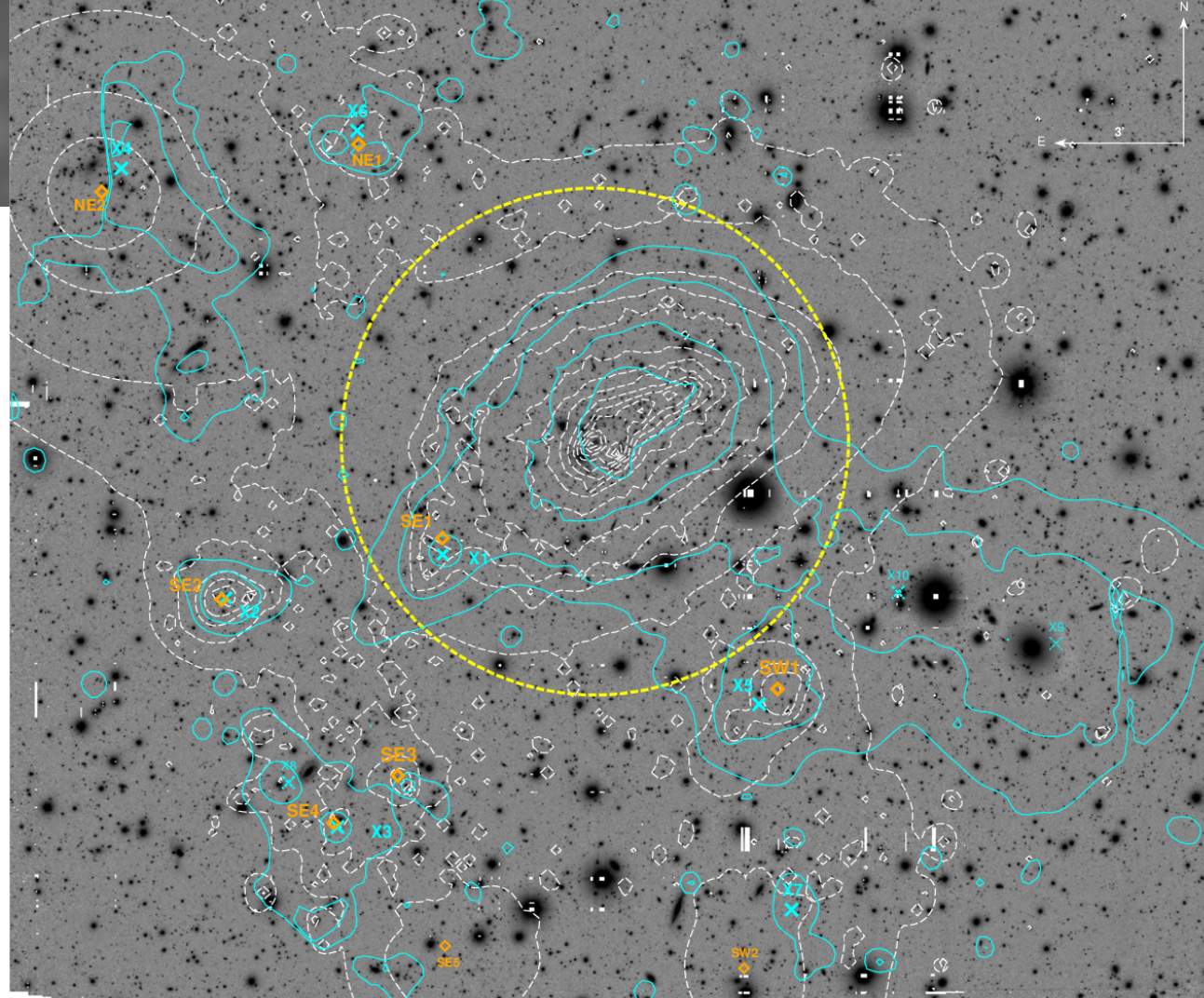
# Something good: Gas properties



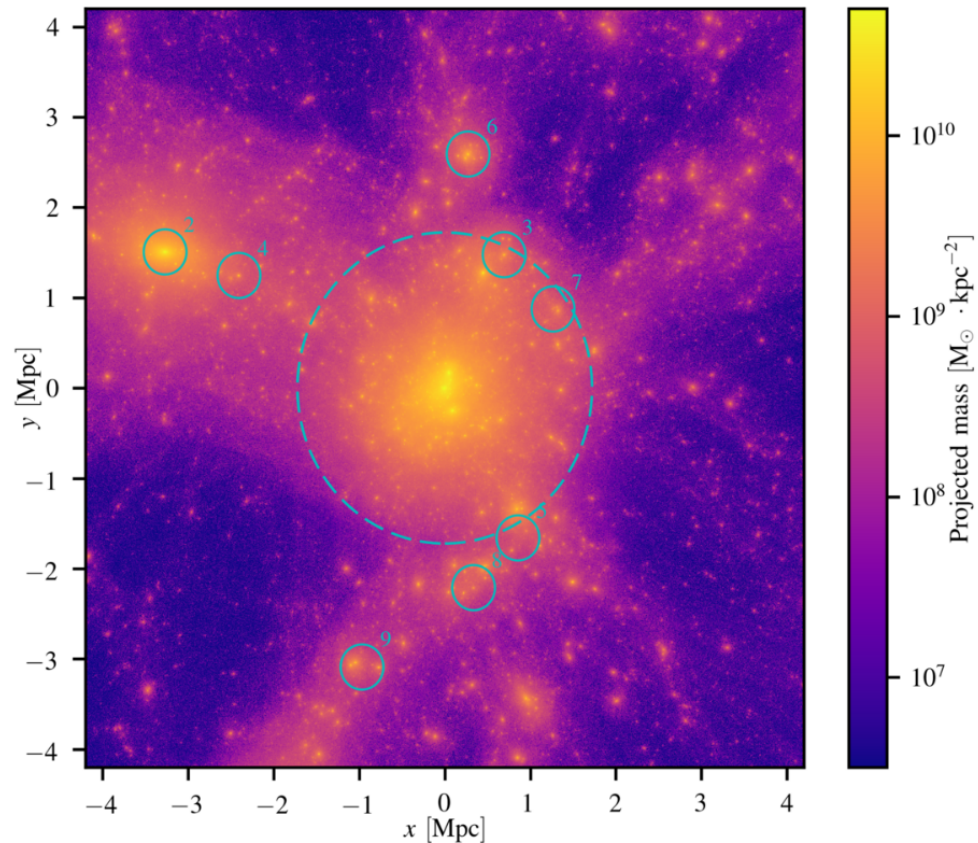
# Some cosmology



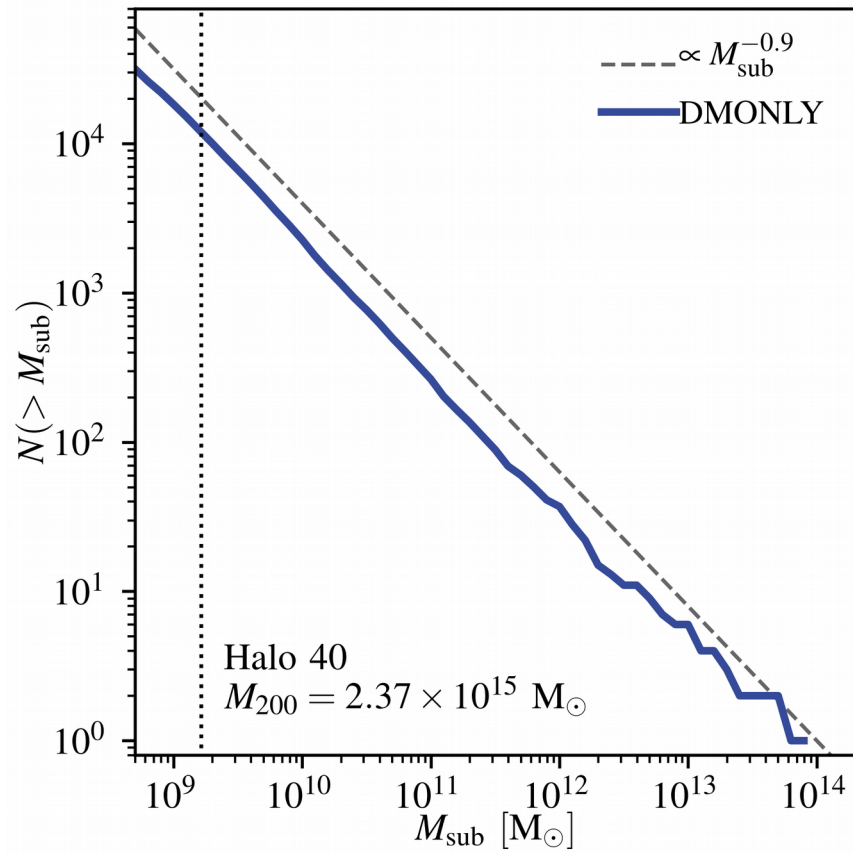


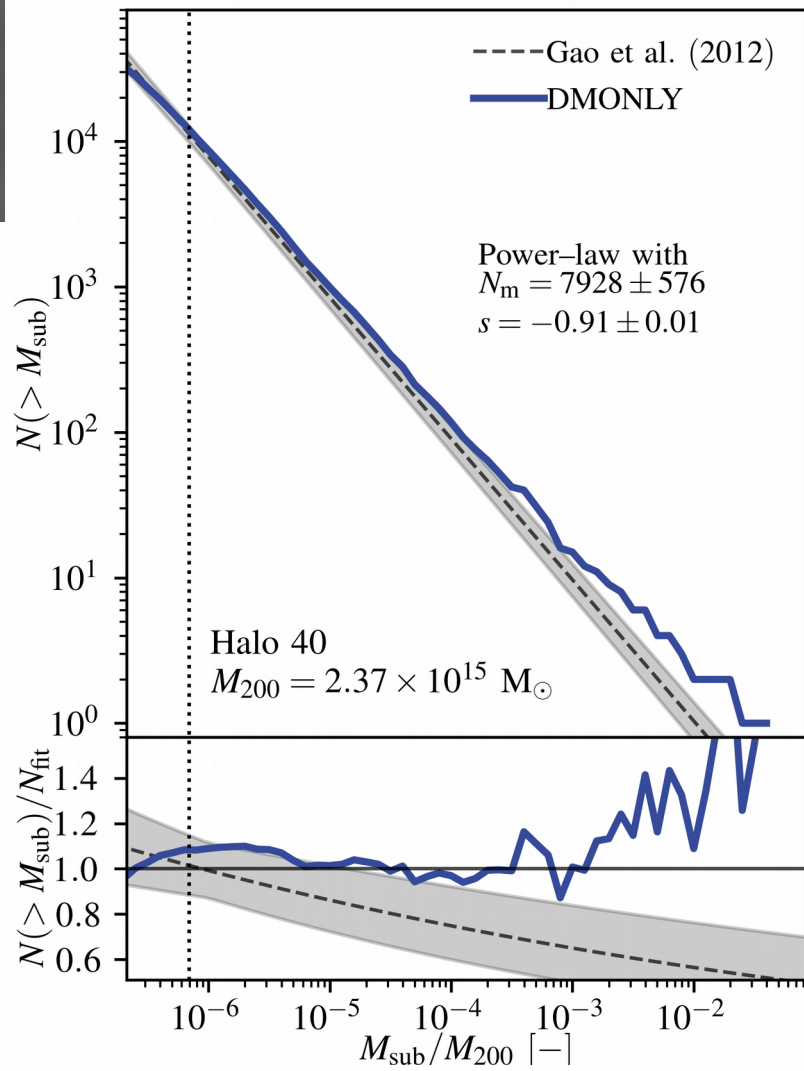


# Mock observation of C-EAGLE



# Does cosmology affect things?

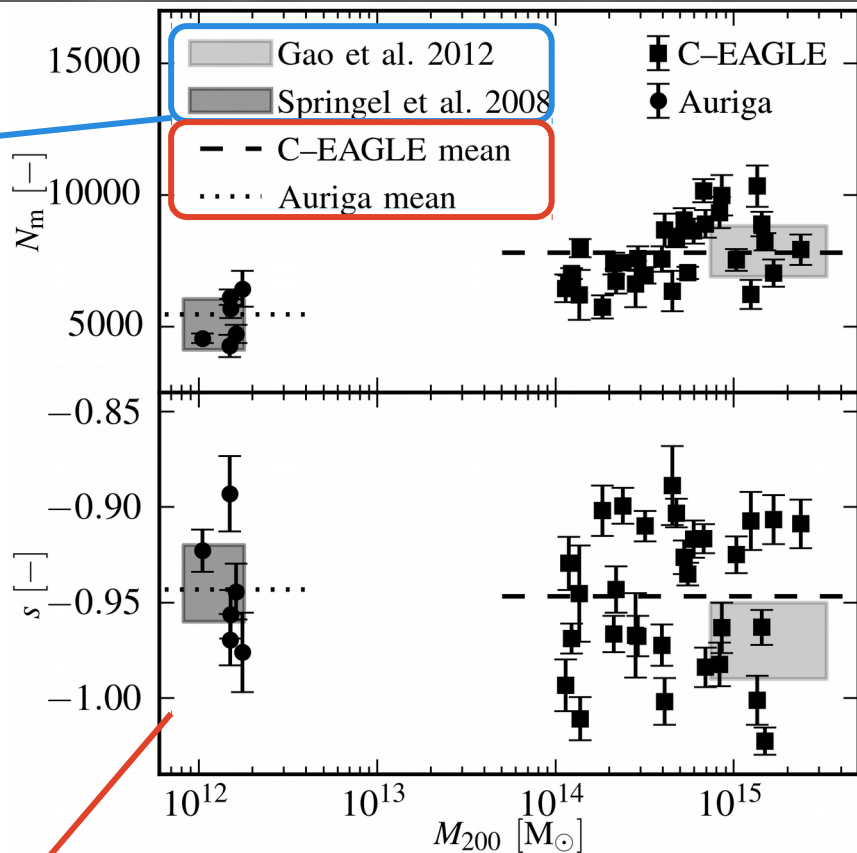




# With the full sample

~ WMAP1  
cosmology

Planck13  
cosmology

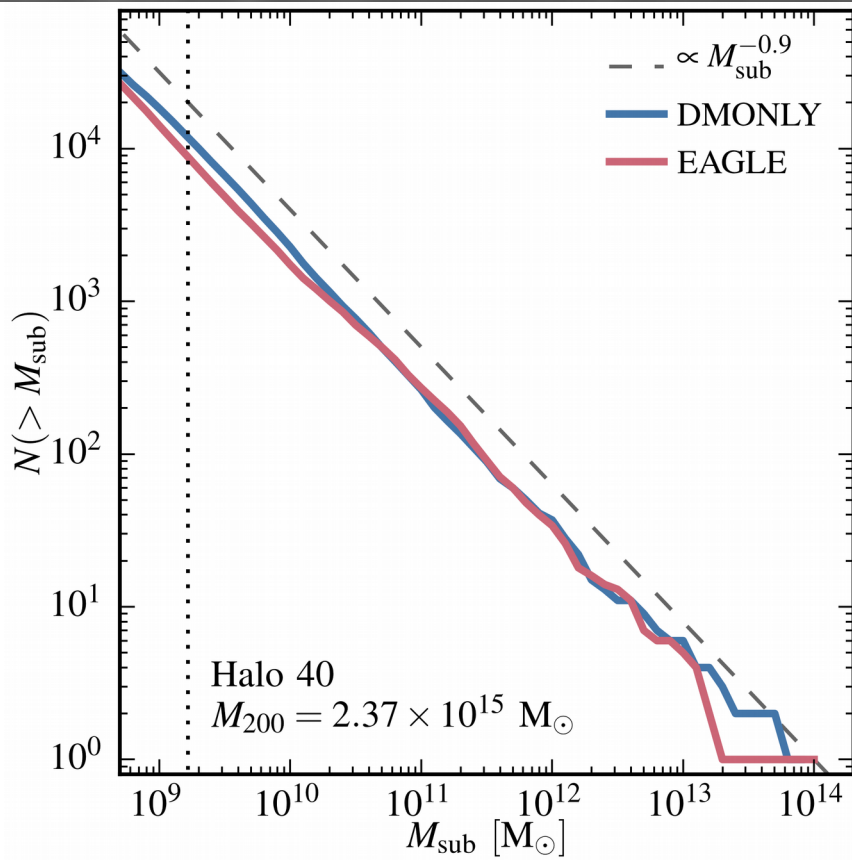


No baryons  
here

No significant  
difference with  
cosmology  
model

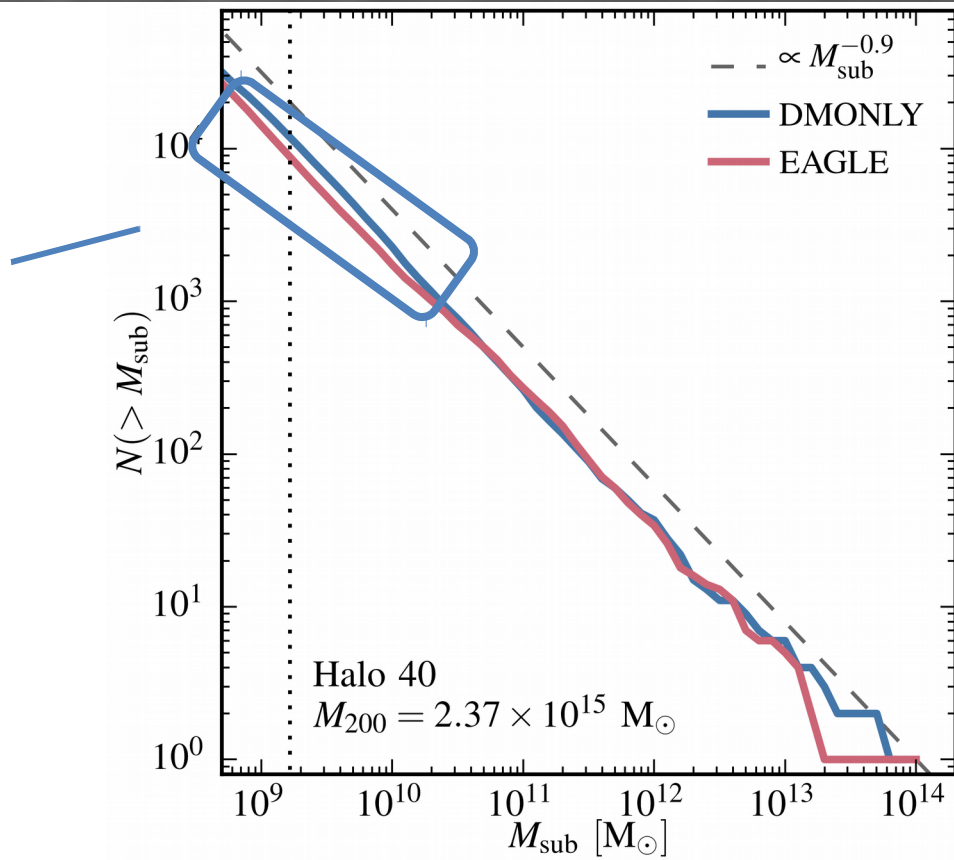
Schaller+18 (almost  
submitted)

# How about with baryons?

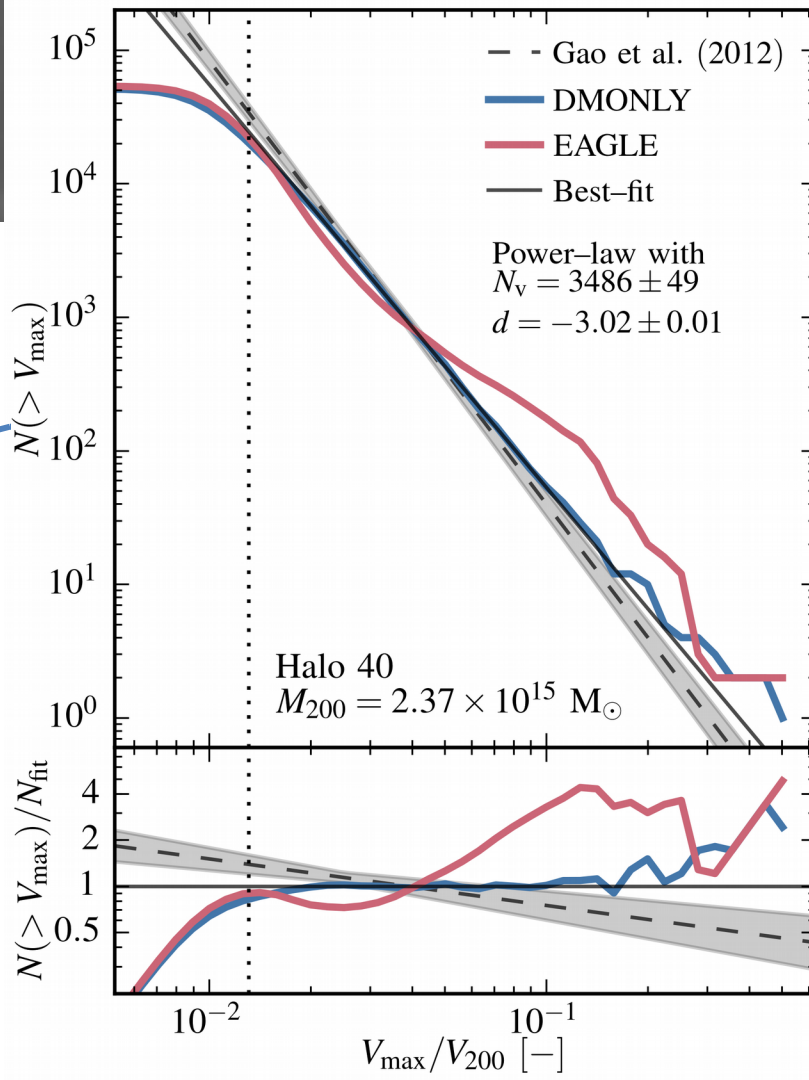


# How about with baryons?

Baryon effects

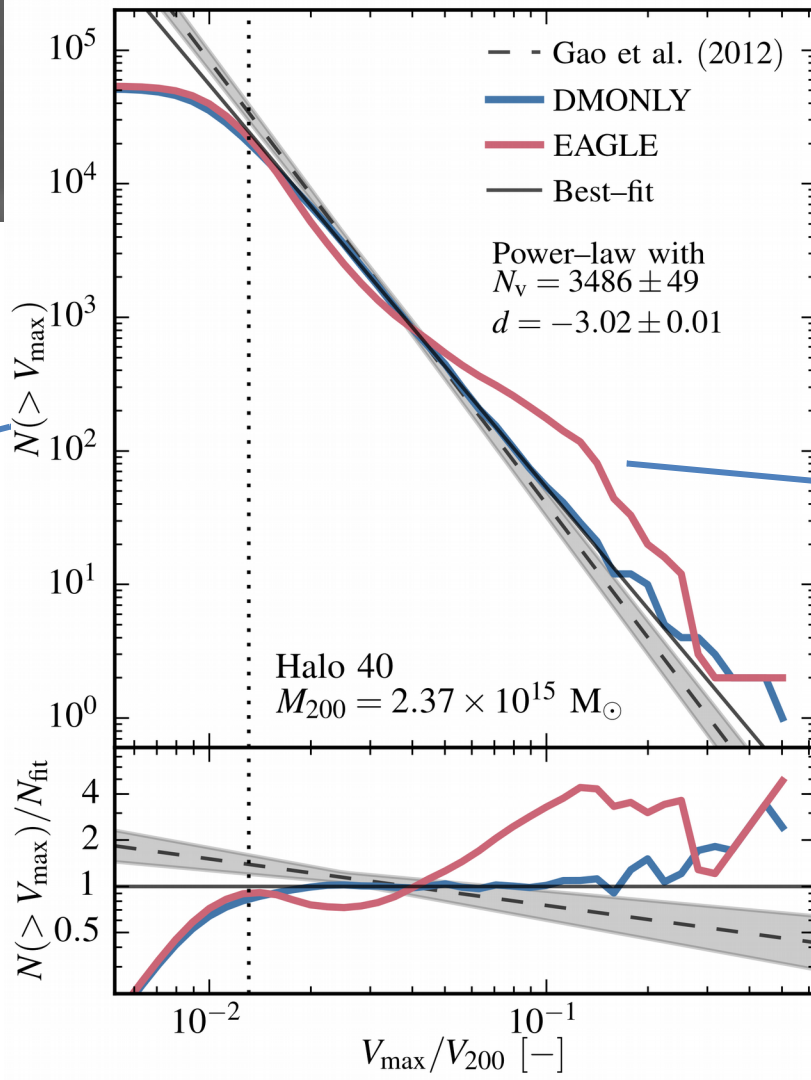


~ Flat part of  
the rotation  
curve





~ Flat part of the rotation curve



Halo contraction  
+  
Feedback  
+  
Stripping  
+  
.....

# Conclusions

- Characterizing the effect of feedback on the total matter distribution is crucial for the success of future cosmology missions.
- The C-EAGLE suite is a powerful tool to look at galaxy evolution and environment effects.
- Baryons have little effect on masses of (large) subhaloes in clusters. But velocity function yields a large wealth of information.



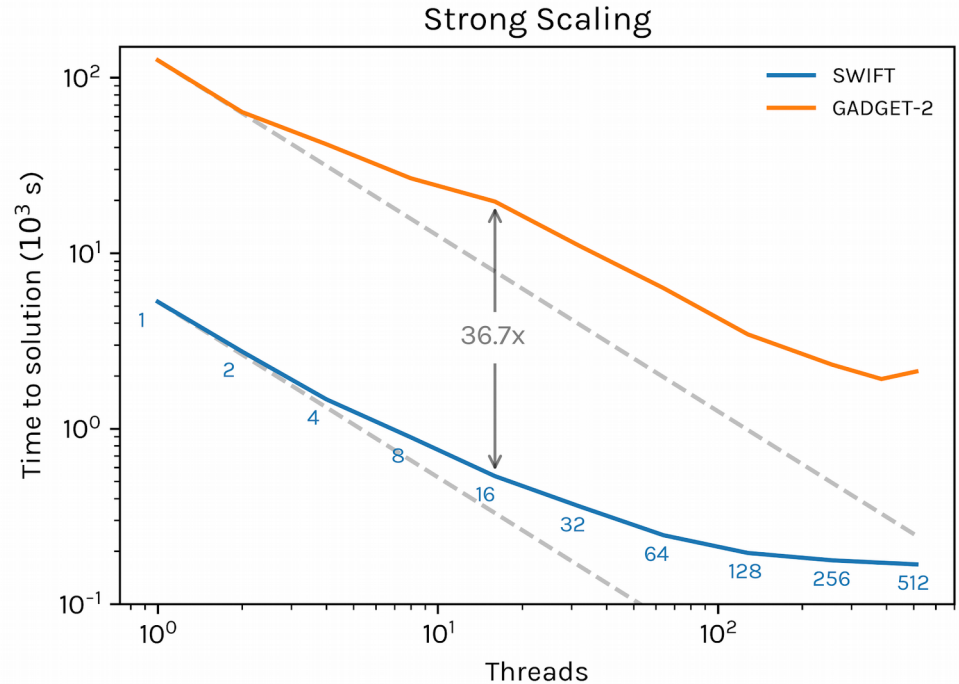
# SWIFT Template

When using this template, you may notice the ‘extra’ image around the edge of the slides. Leave this be -- it avoids things looking weird at the edges of your slides when presenting.

- Bullet Points
- Make Slides
- Great Again

# Example Plot

- Wow
- Such
- Results
- Colours:
  - Blue: #298BDF
  - Dark Blue: #145289
  - Orange: #DF4229
  - Dark Orange: #90382B



Use a text box with 14 pt. Roboto Bold for Captions.