

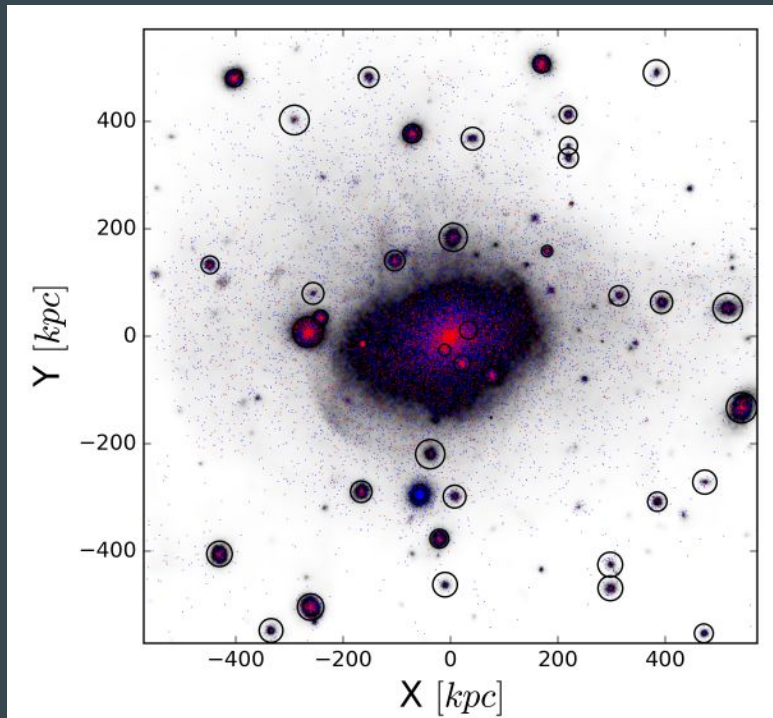
# Globular Clusters as tracers of the dark matter content of dwarf galaxies



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AAS 237, January 11th, 2021  
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# Background

- Nearly all galaxies host a system of globular clusters (GCs).
- GCs are notoriously difficult to form and follow in simulations.
- We tag GCs to the Illustris simulation using a post-processing model



# Motivation

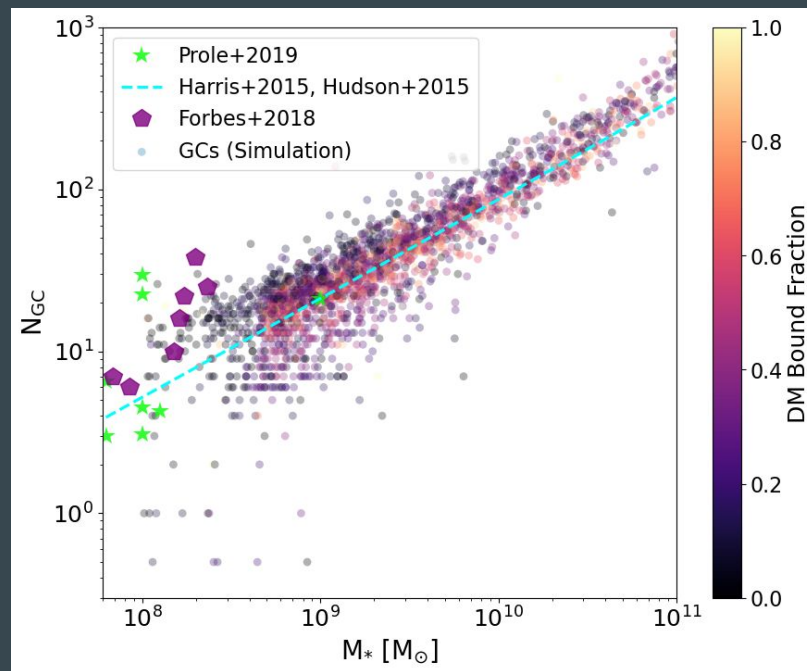
- Globular Cluster systems of some ultradiffuse galaxies (UDGs) suggest little to no dark matter content.
- How do seemingly dark matter free galaxies like DF2 and DF4 fit into the LCDM framework?



DF2, Hubble Space Telescope

# Results

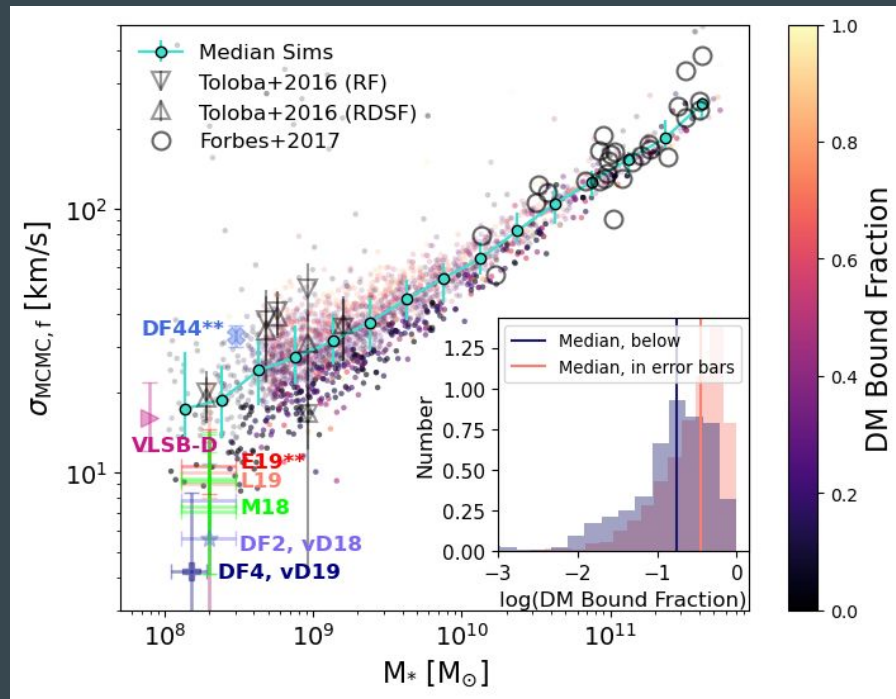
- Our tagged GCs fit well in the context of observations.
- The scatter in the observations is also reproduced



Doppel et. al. 2020

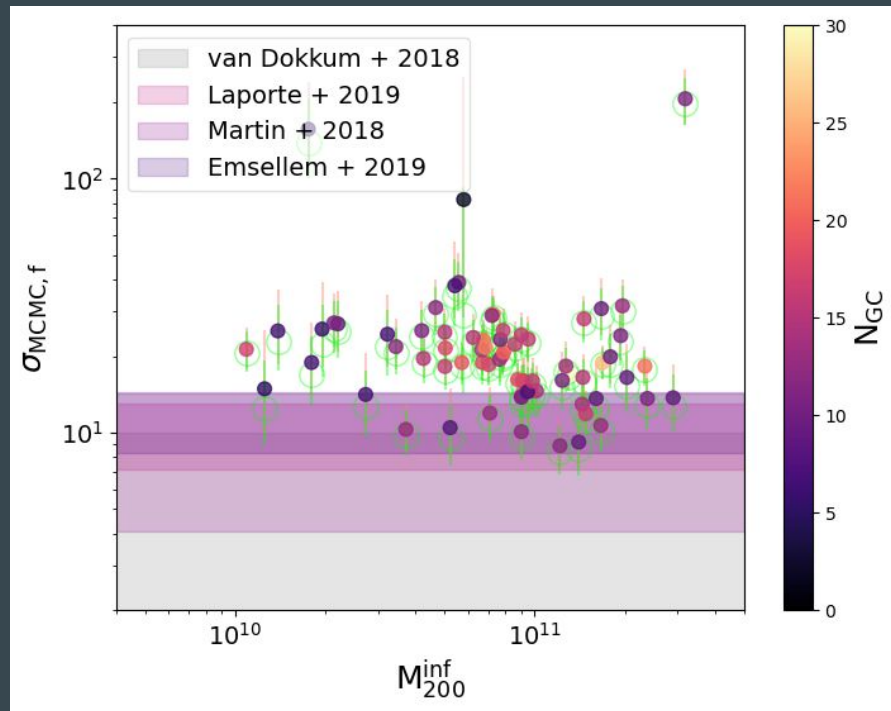
# Implications

- Galaxies with low velocity dispersion GC systems have lost a median of 83% of their dark matter content
- The measured velocity dispersions of DF2 and DF4 sit well below those predicted by the simulations.



# Implications

- DF2 like objects infell as normal, dwarf halos and lost  $\sim 90\%$  or more of their dark matter content.
- DF4 shows signs of tidal stripping (Montes et. al. 2020)
- We can form these objects in a LCDM paradigm



# Recap

- We've added globular clusters to the Illustris simulation
- Galaxies that have lower GC system velocity dispersion at fixed stellar mass tend to have experienced more tidal stripping
- Ultradiffuse galaxies with very low GC velocity dispersions may have formed from dwarf halos that have lost more than 90% of their dark matter mass

Thanks for Listening!