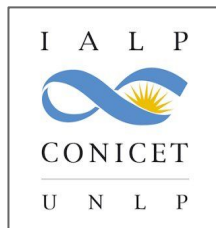# Target selection in the Antlia Cluster from DEcam data

JP. Calderón

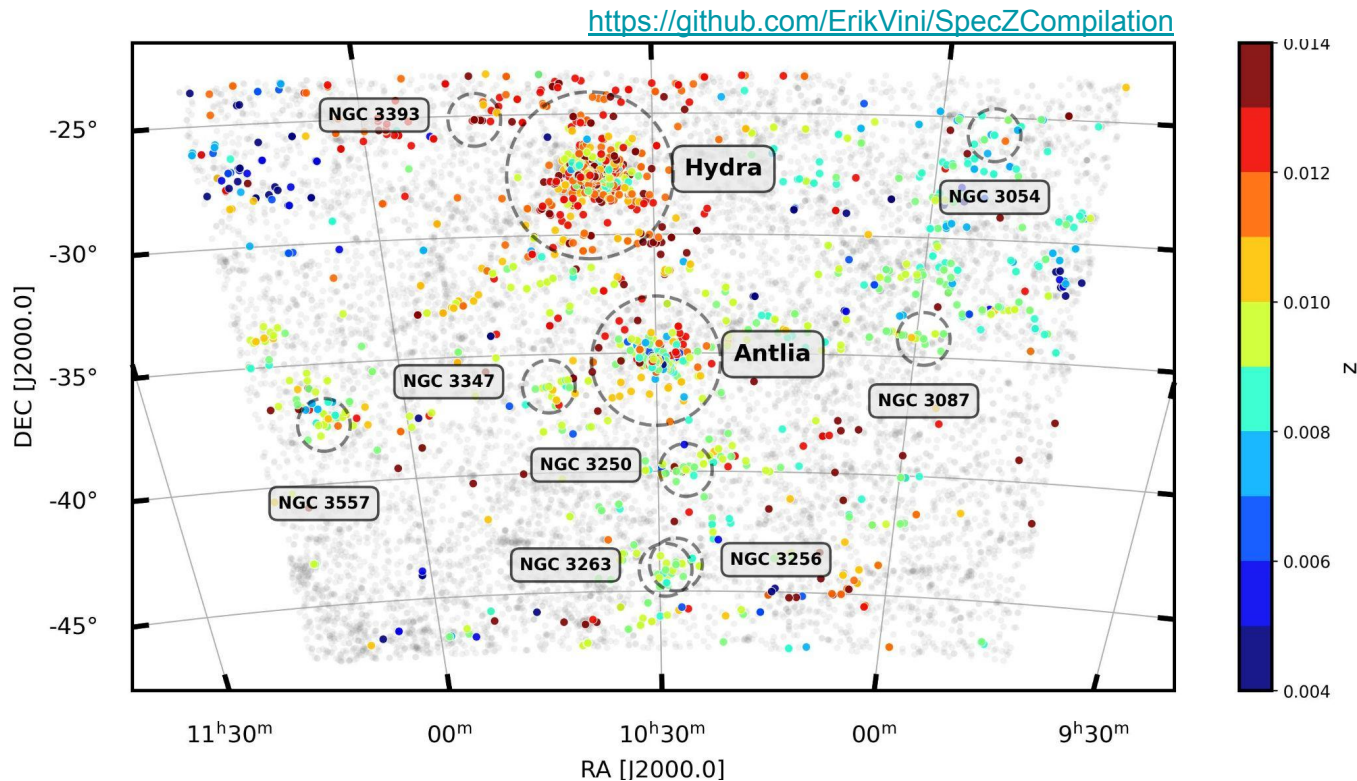Universidad Nacional de La Plata - CONICET

Outline

1. Introduction
2. Cluster characteristics
3. Working with DECam data
4. Working with S-PLUS data
5. Summary and conclusions

Introduction

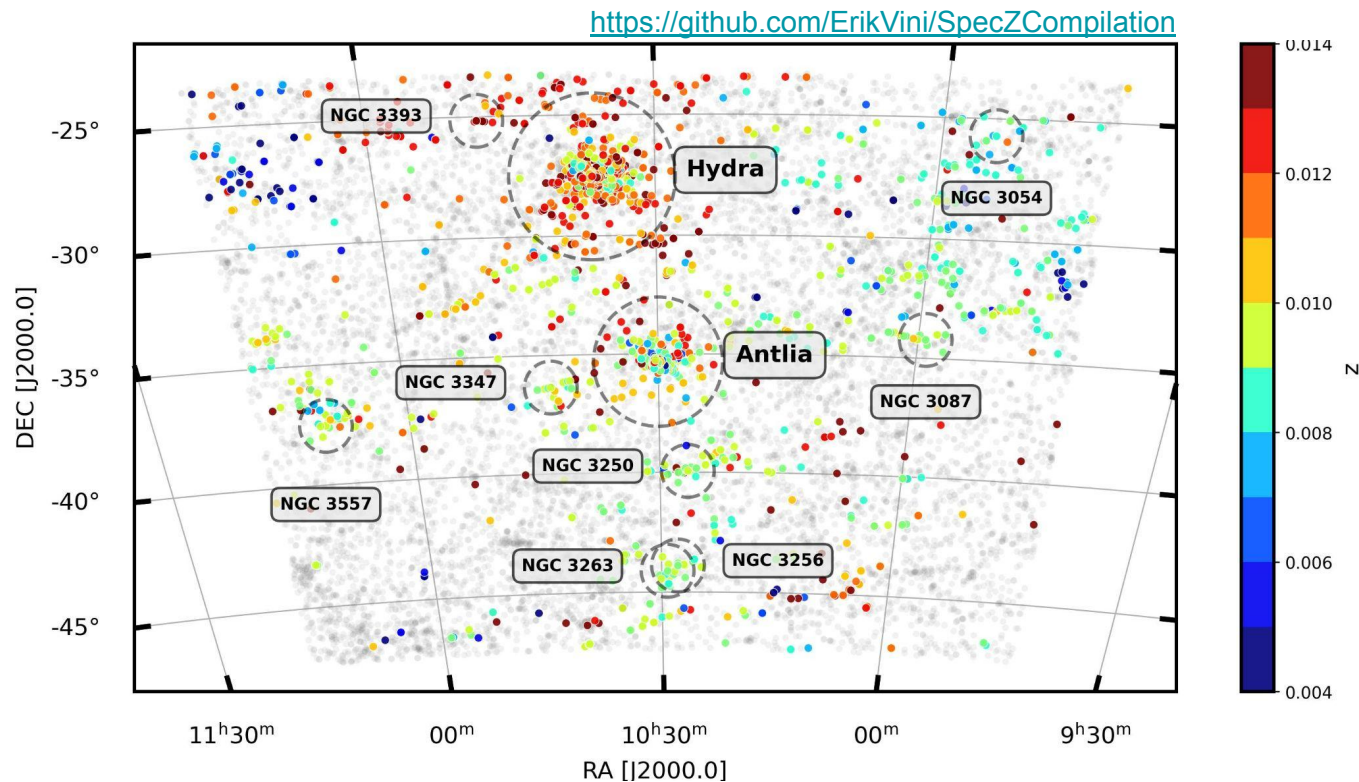# The Antlia Cluster (Abell 0636)

D ~ 35.2 Mpc*

z ~ 0.004 - 0.014

https://github.com/ErikVini/SpecZCompilation

*Dirsch et al. (2003)

The Antlia Cluster

D ~ 35.2 Mpc

z ~ 0.004 - 0.014*
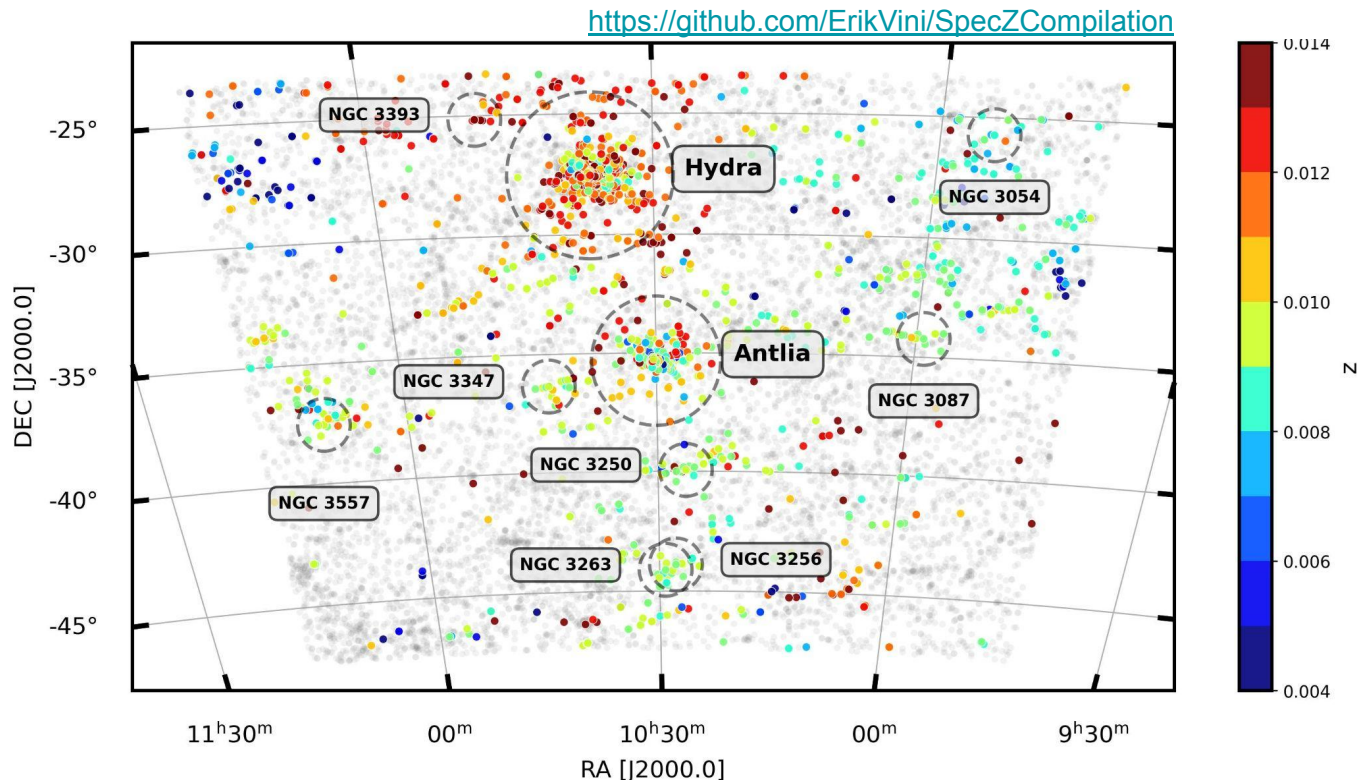(low-redshift sub-survey)

https://github.com/ErikVini/SpecZCompilation

*Smith Castelli et al. (2008)

The Antlia Cluster

D ~ 35.2 Mpc

z ~ 0.004 - 0.014

Central
 galaxy $\gtrsim$ For/Vir
density*

https://github.com/ErikVini/SpecZCompilation

*Calderón et al. (2015)

The Antlia Cluster
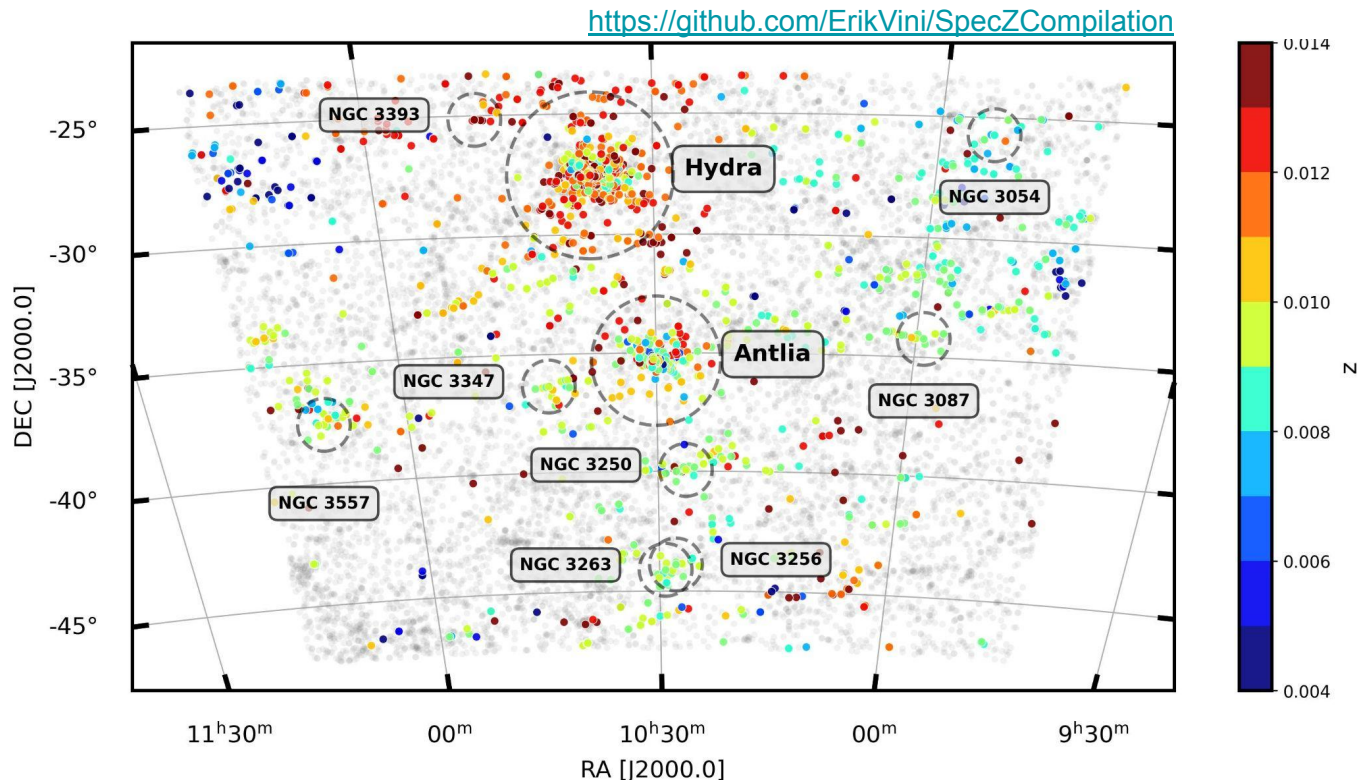
D ~ 35.2 Mpc

z ~ 0.004 - 0.014

Central
 galaxy ≳ For/Vir
 density

Dynamically
younger than
For/Vir*

Isothermal
non-cool core
cluster (kT~2 keV)*

https://github.com/ErikVini/SpecZCompilation

*Wong et al. (2016)

The Antlia Cluster

D ~ 35.2 Mpc

z ~ 0.004 - 0.014

R_{200} ~ 887 kpc*

Elongated distribution:

NGC 3268   **NGC 3258**

https://github.com/ErikVini/SpecZCompilation
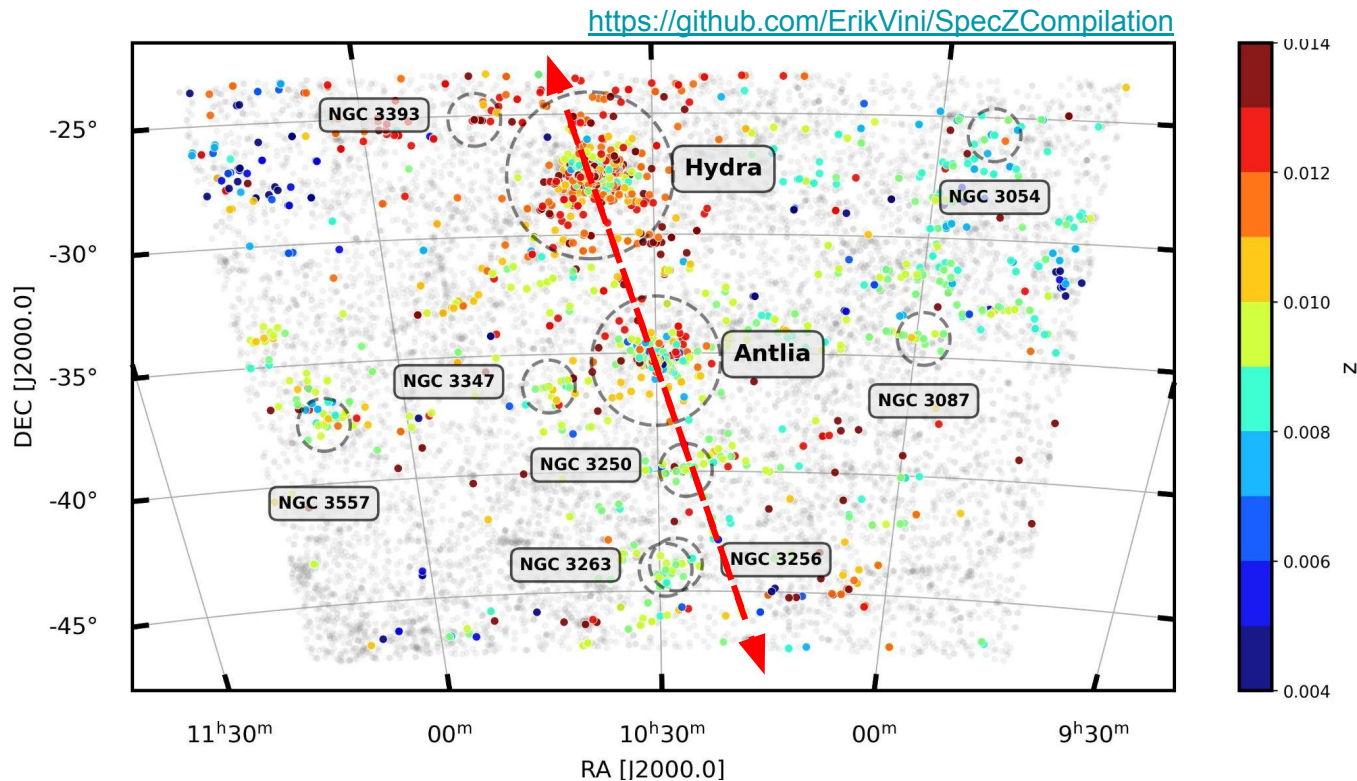
*Sarkar et al. (2022)

The Antlia Cluster

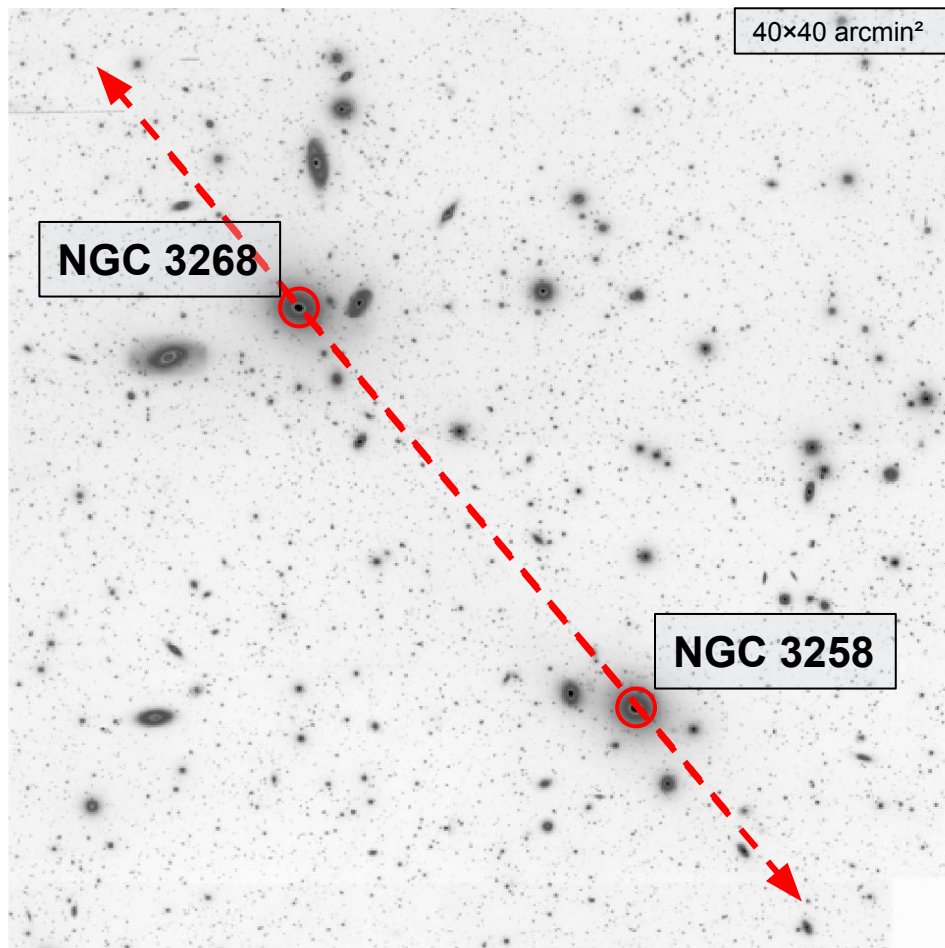NGC 3258 / NGC 3268

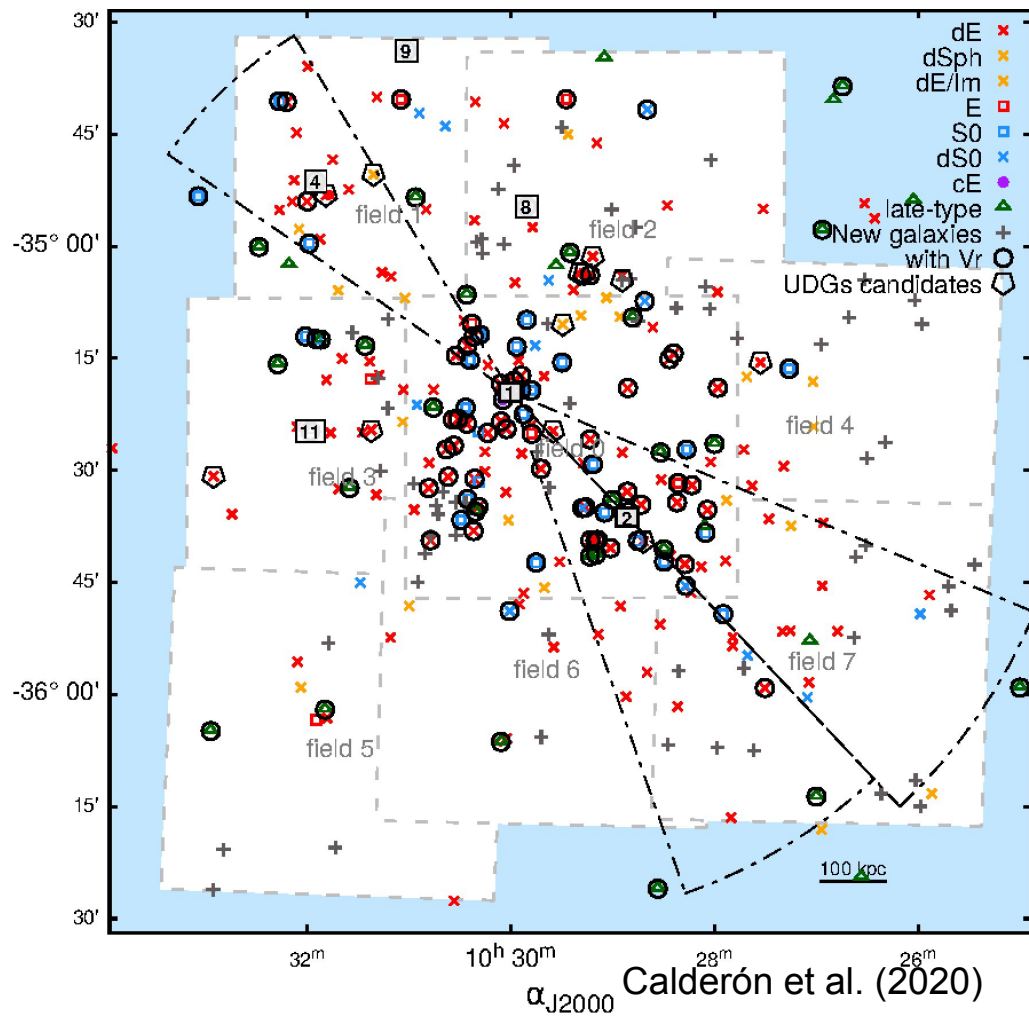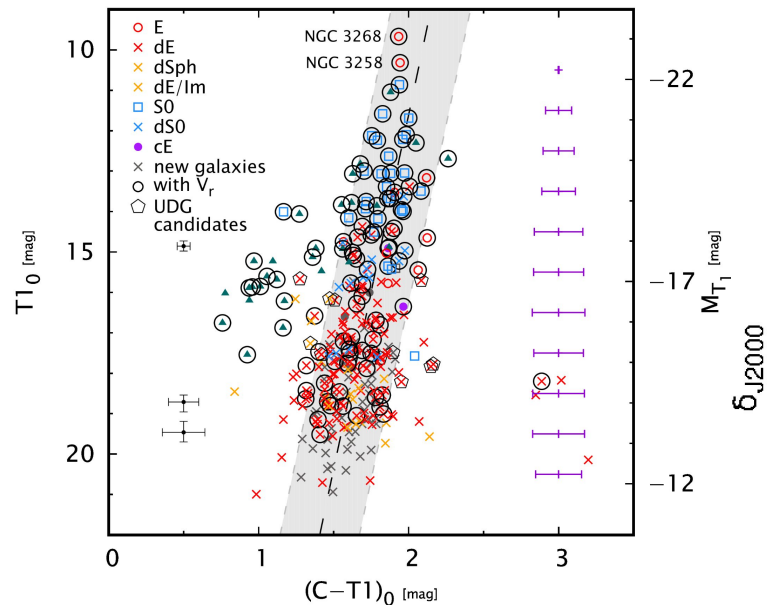Radial velocity of 114 objects of a total of 543

Membership status:

(with Rv)

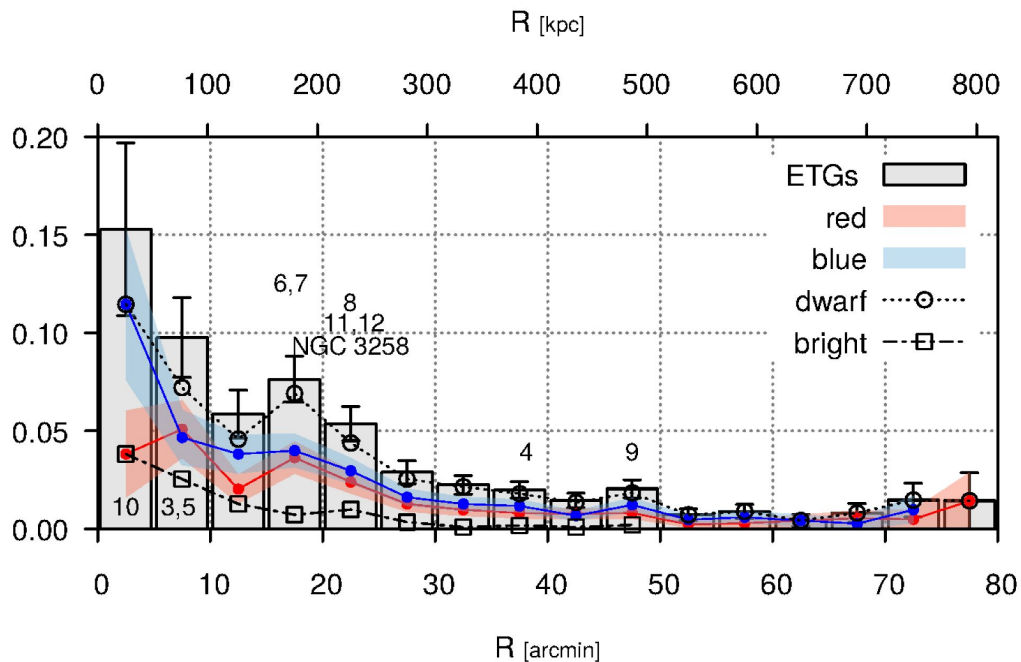| 1	definite	95%
2	likely	82%
3	possible	-

40×40 arcmin²

NGC 3268

NGC 3258

Calderón et al. (2020)
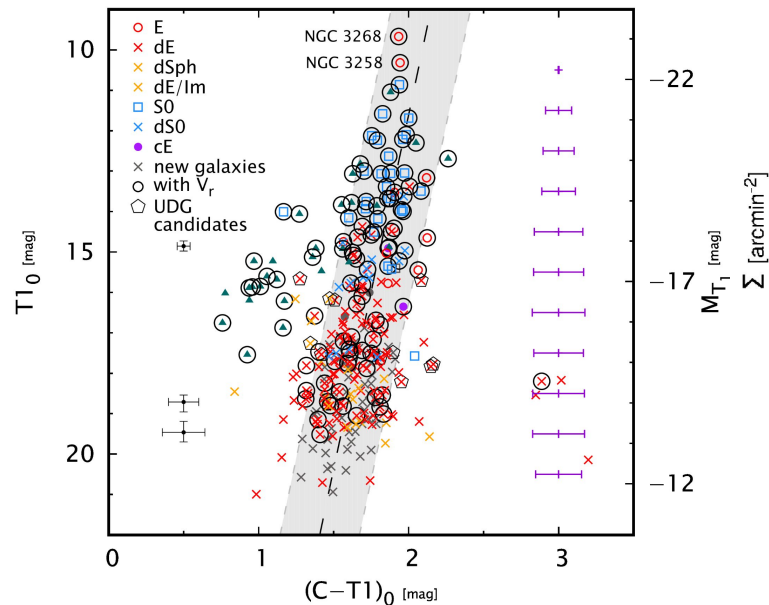
The Antlia Cluster

Calderón et al. (2020)

The Antlia Cluster

Calderón et al. (2020)

The Antlia Cluster

Calderón et al. (2020)

Working with DECam data

The Antlia Cluster

Band	g	r	i	z
# im	115	118	126	17
exp [s]	200	200	200	200

We use **OSI** images (see DECam docs)

GAIA to register the images

PSF (PSFex + SExtractor) ⟶ R fiber

Calibration equations (ATLAS-REFcat2)

Filter: FLAGS & MAGERR_AUTO &

      CLASS_STAR

Remove background objects

2.2×2.2 deg²

The Antlia Cluster

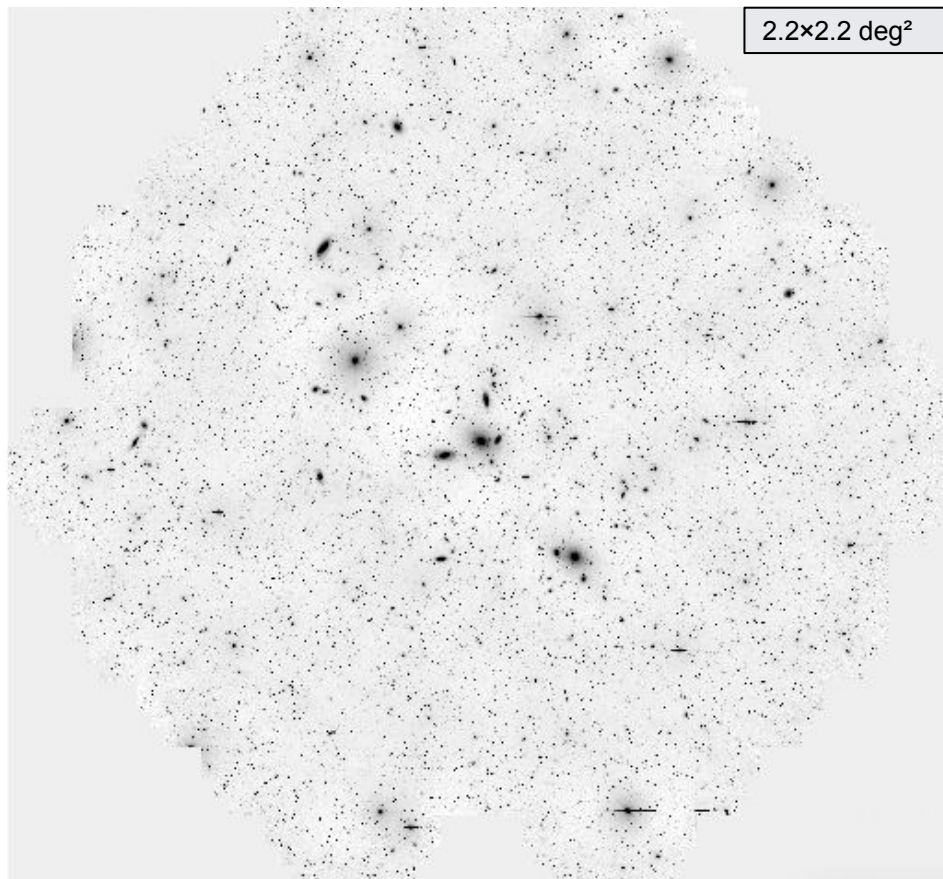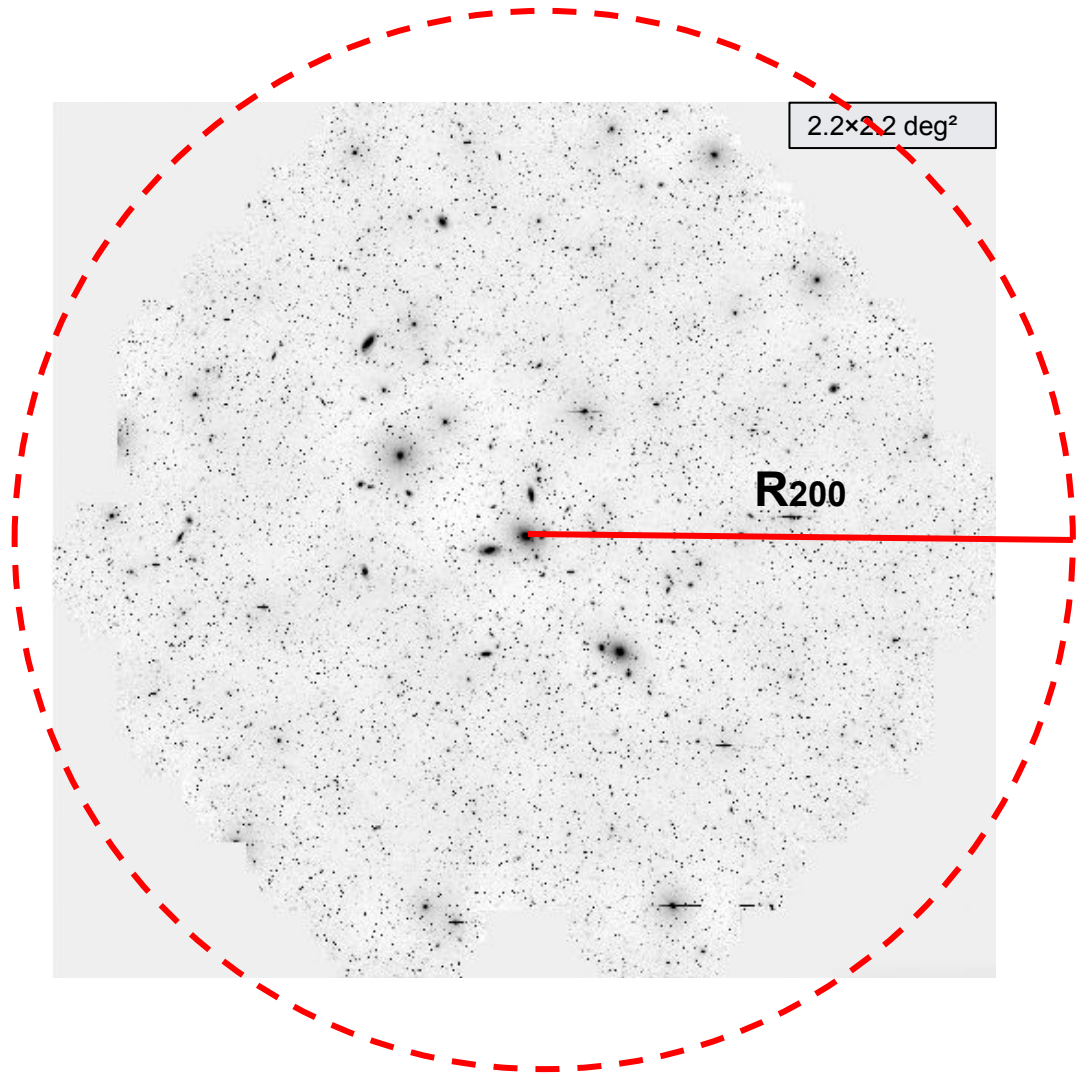| Band	g	r	i	z
# im	115	118	126	17
exp [s]	200	200	200	200

We use **OSI** images (see DECam docs)

GAIA to register the images

PSF (PSFex + SExtractor) ⟶ R fiber

Calibration equations (ATLAS-REFcat2)
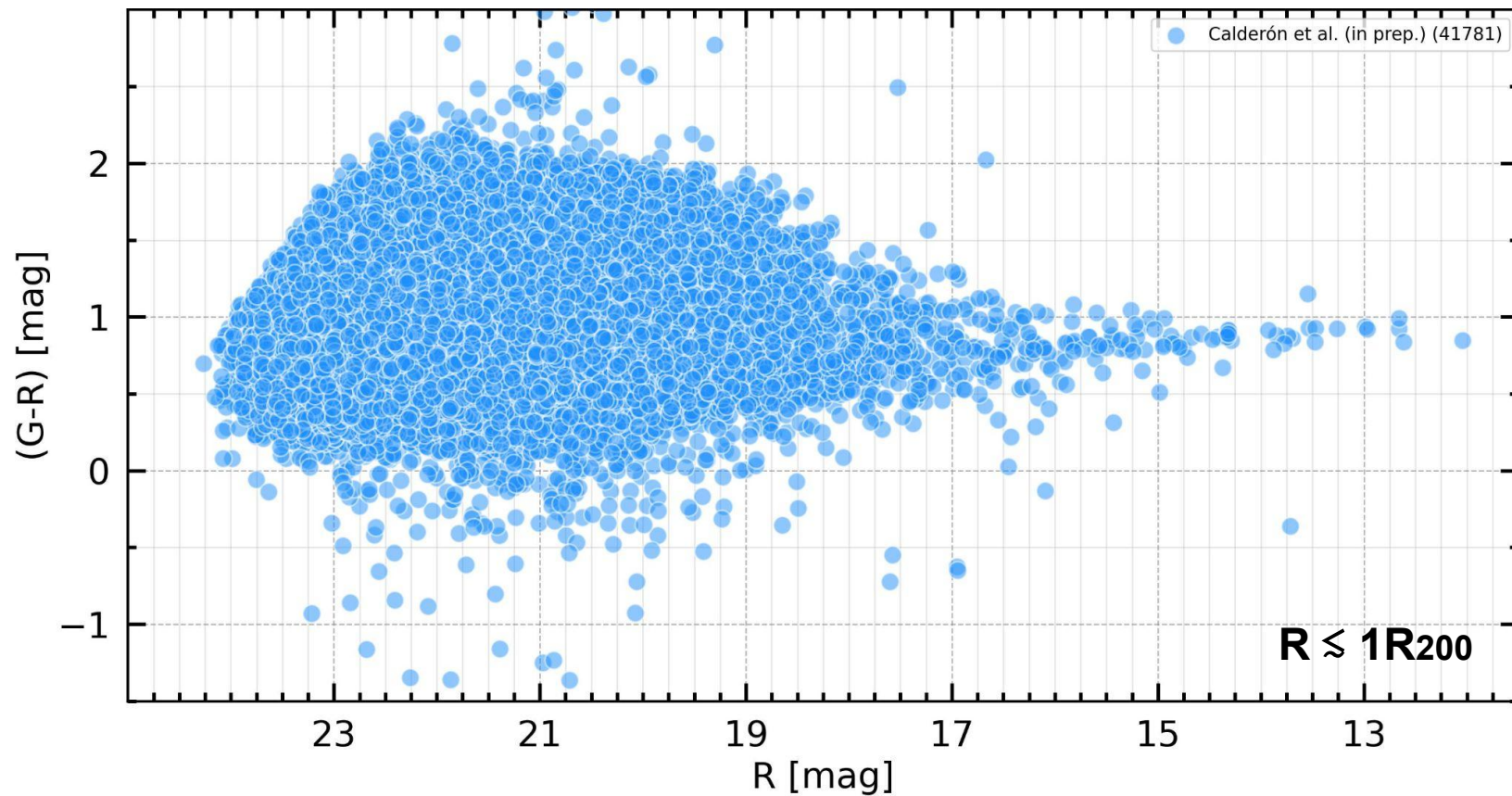
Filter: FLAGS & MAGERR_AUTO &

      CLASS_STAR

Remove background objects
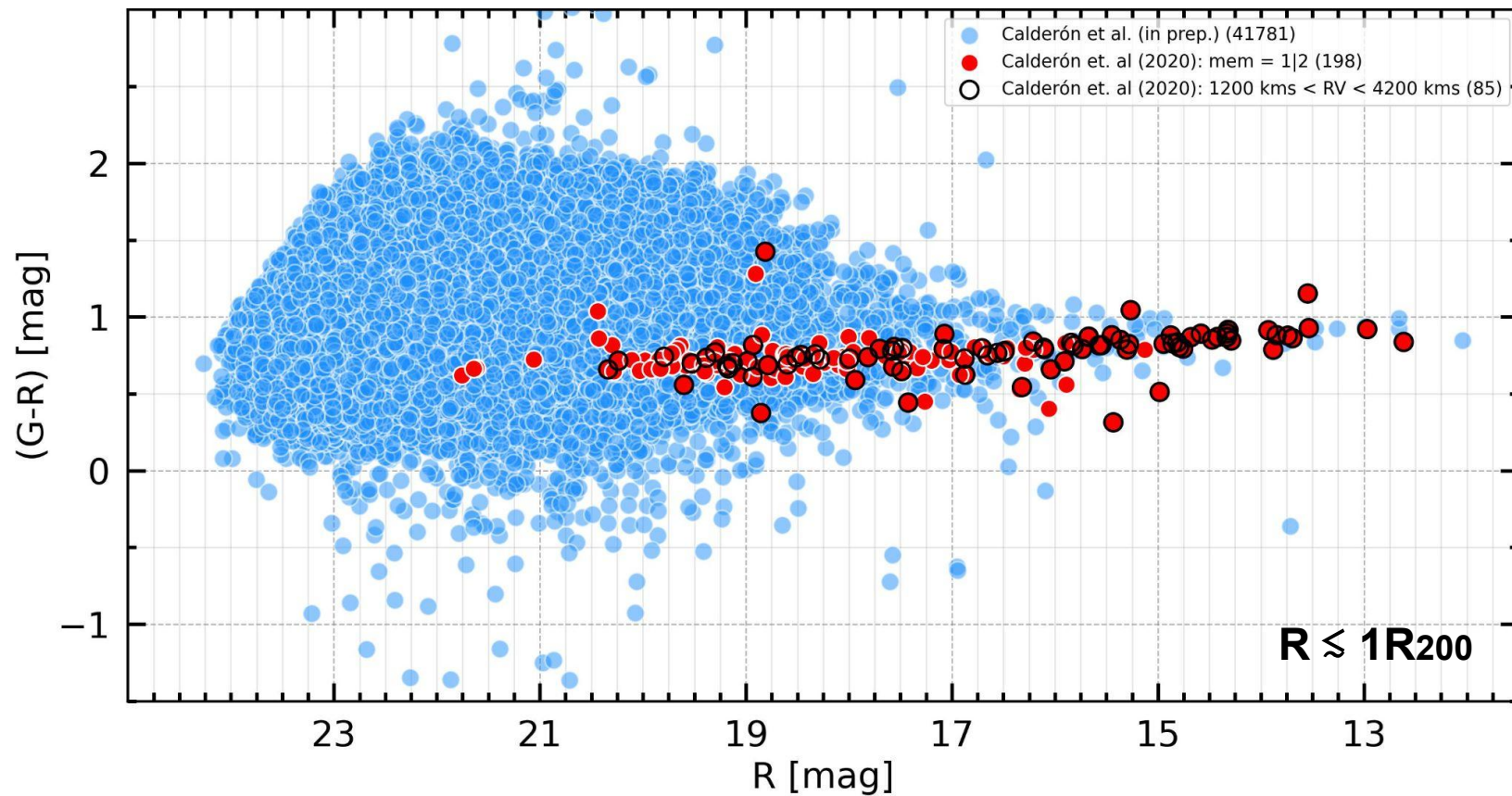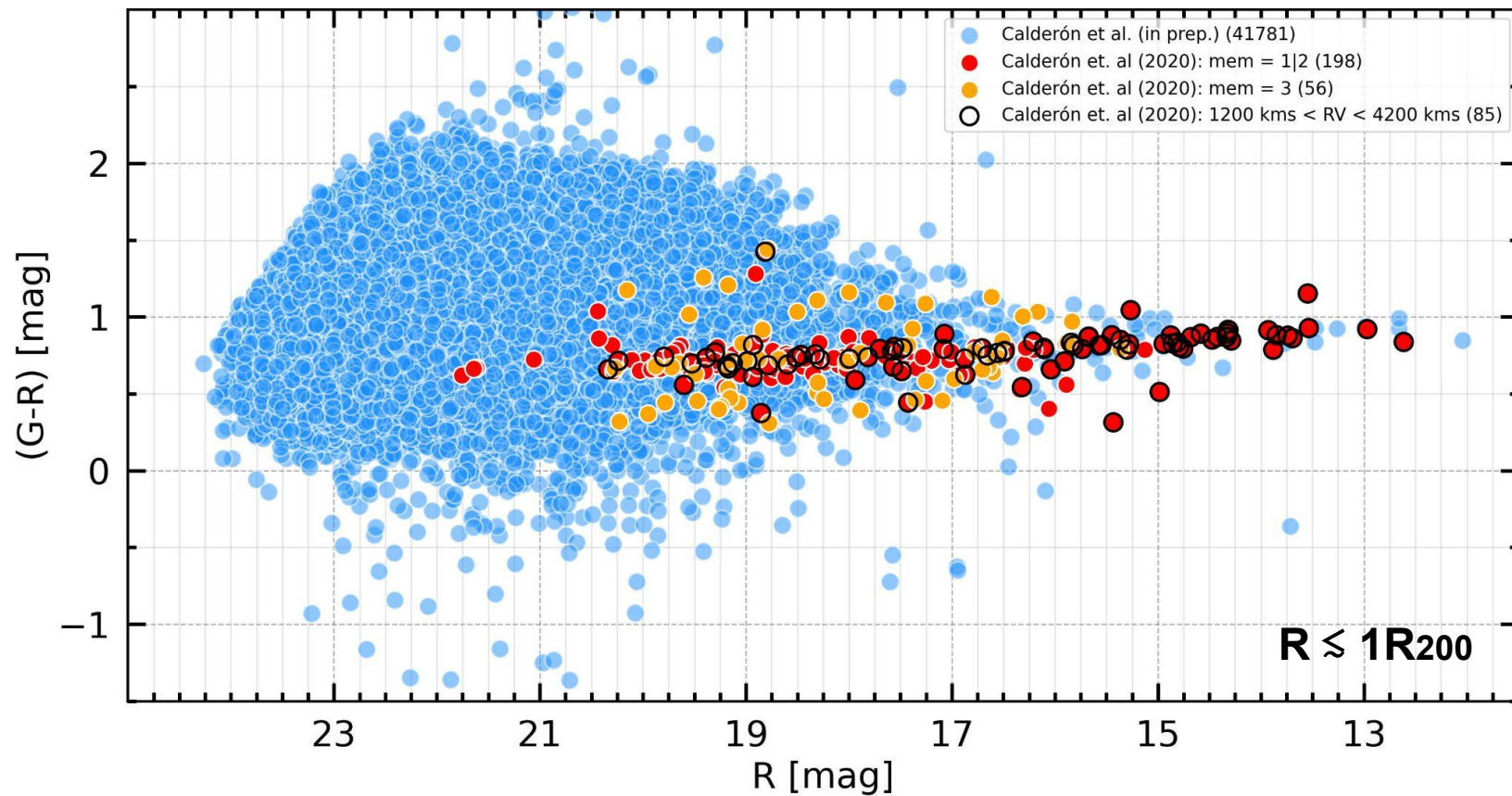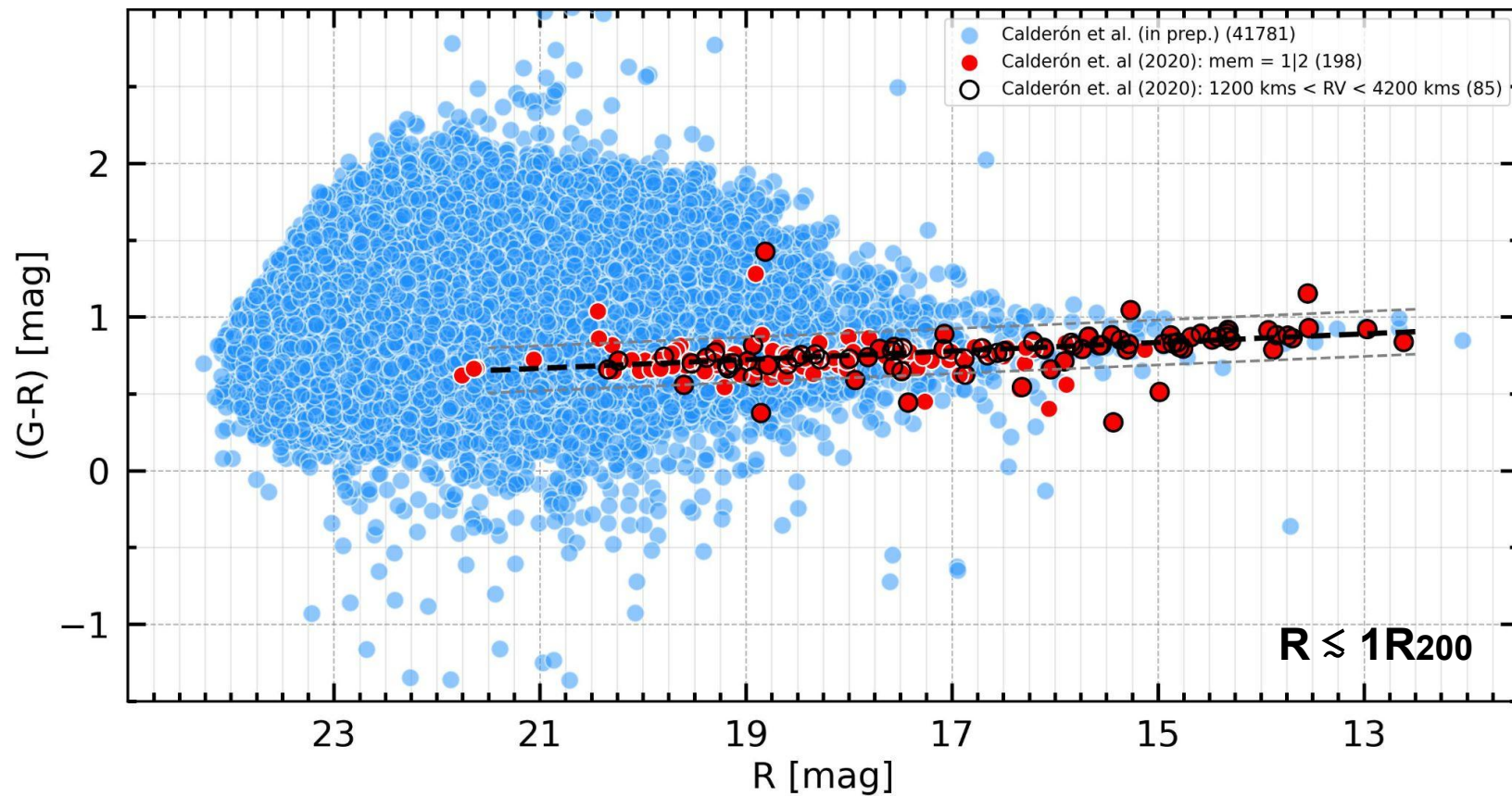

2.2×2.2 deg²

R_{200}

Results

The Antlia Cluster: DECam
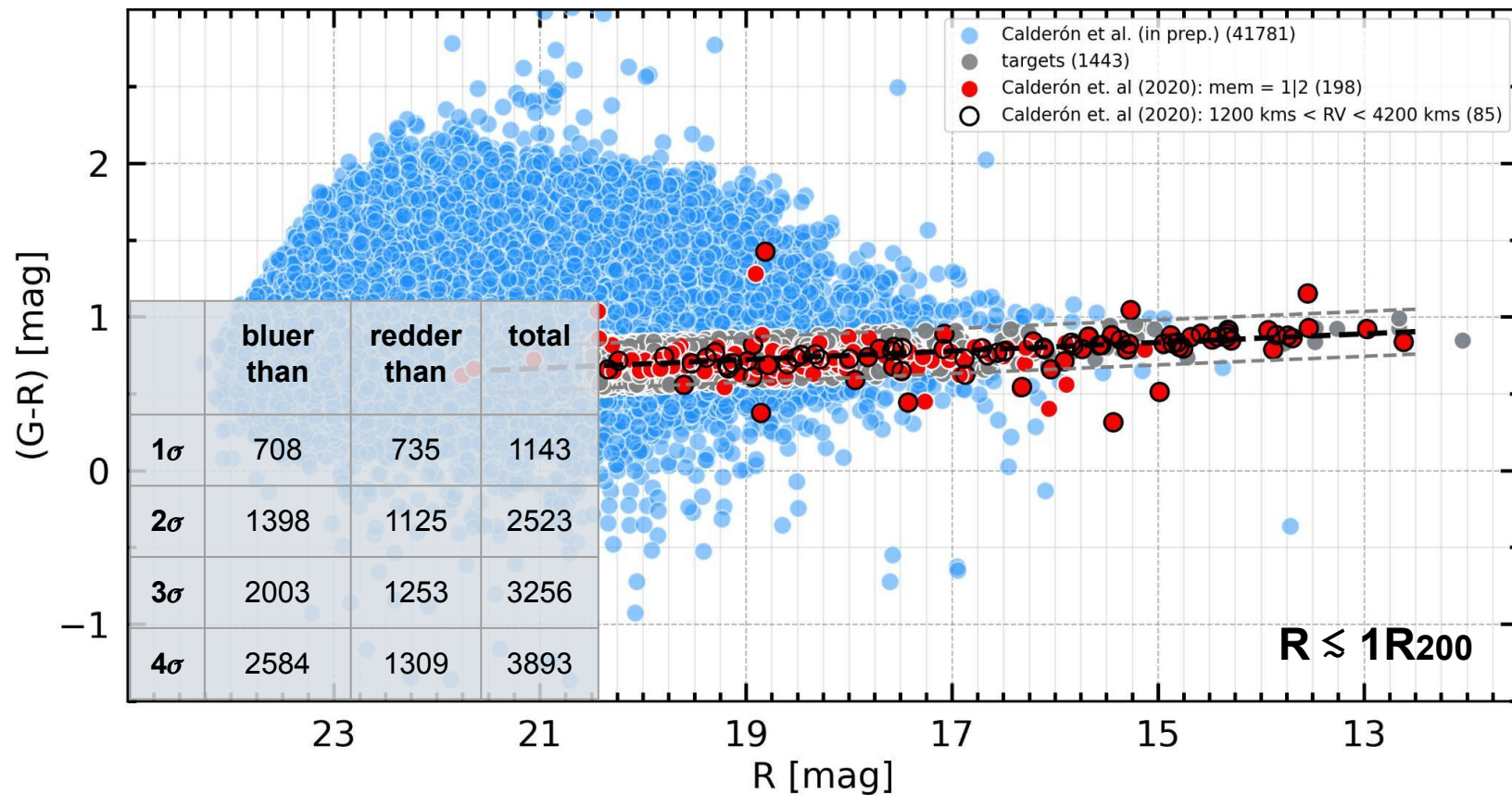
The Antlia Cluster: DECam
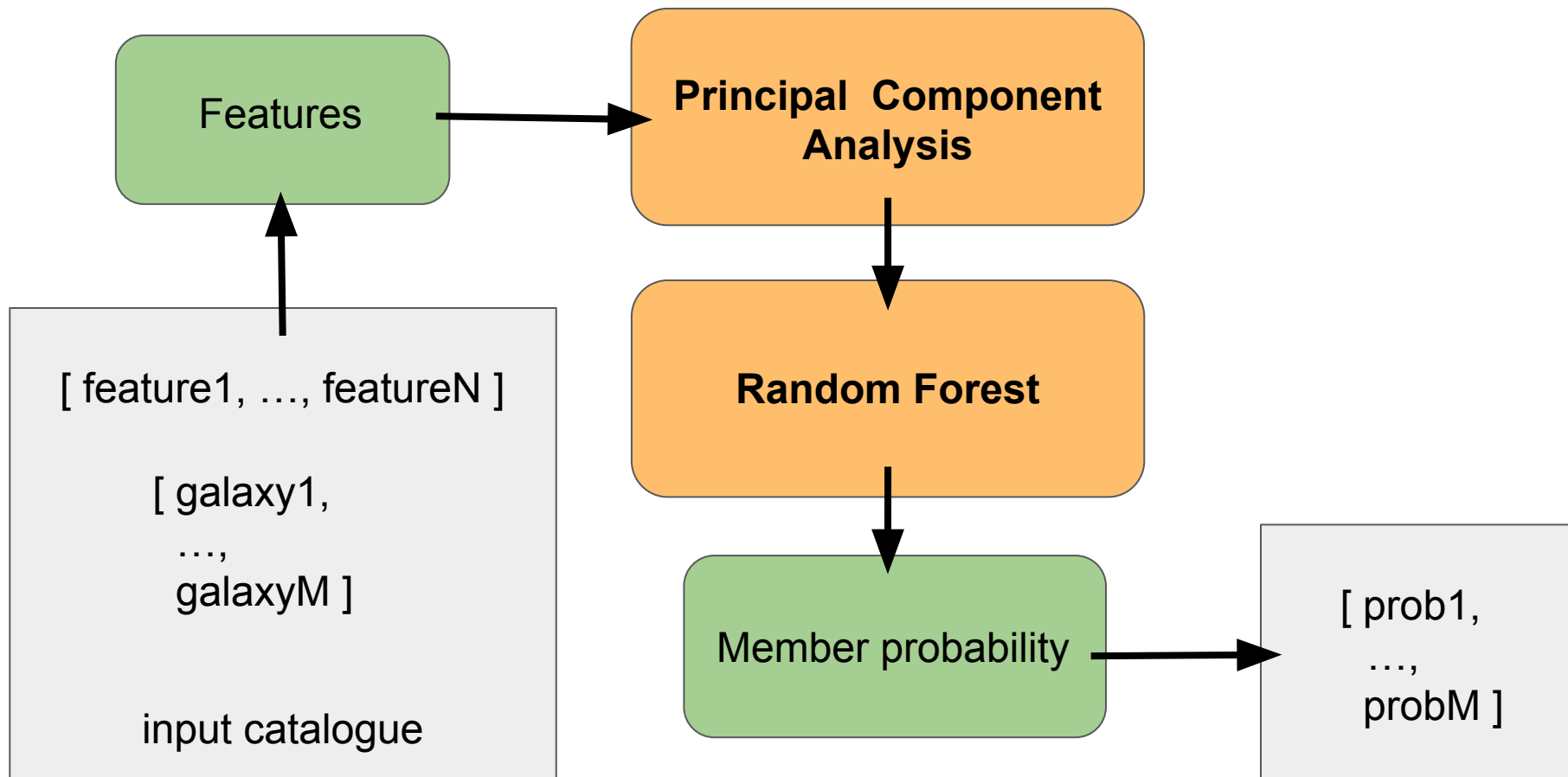
The Antlia Cluster: DECam

The Antlia Cluster: DECam

The Antlia Cluster: DECam

Working with S-PLUS data

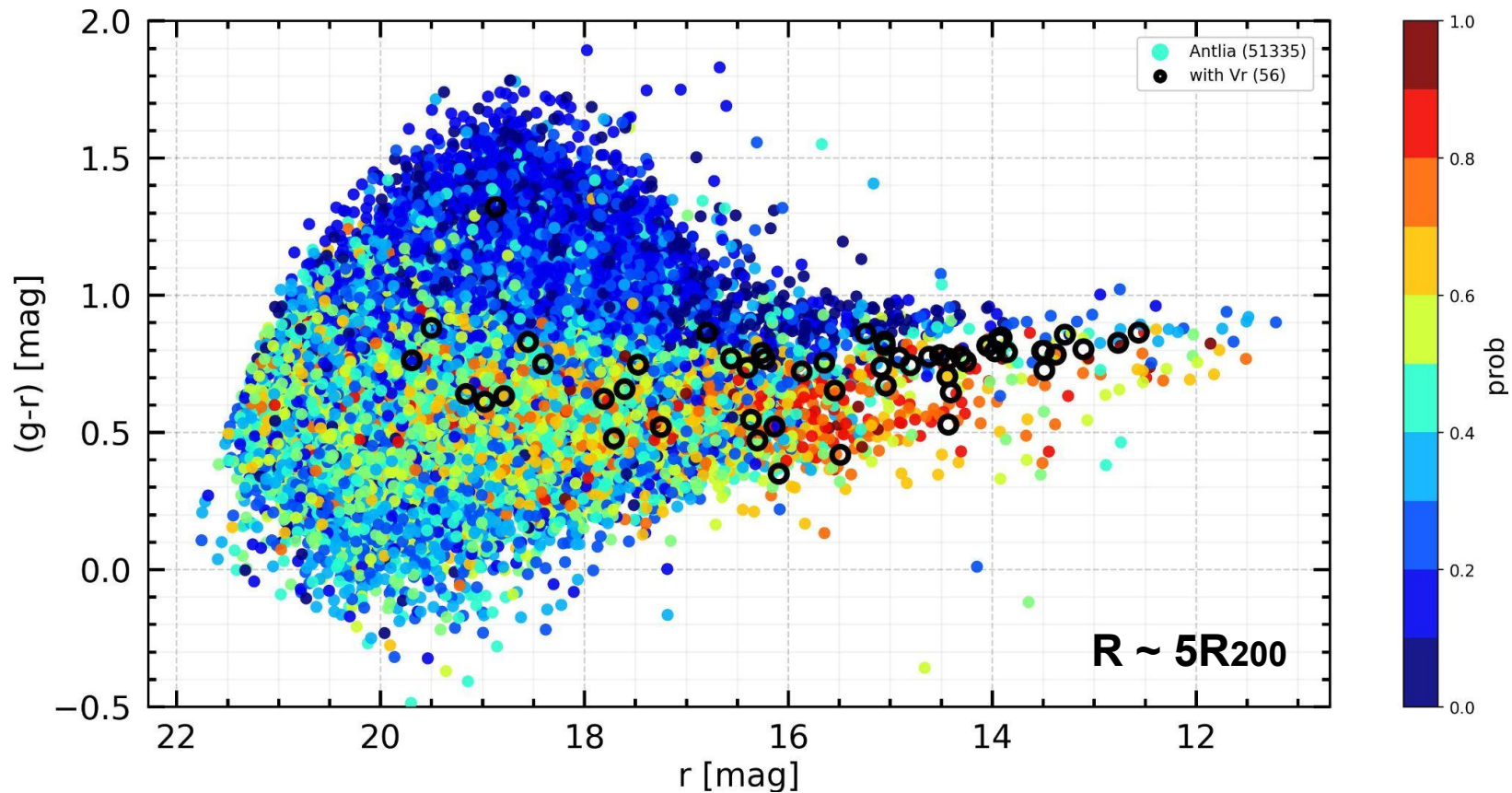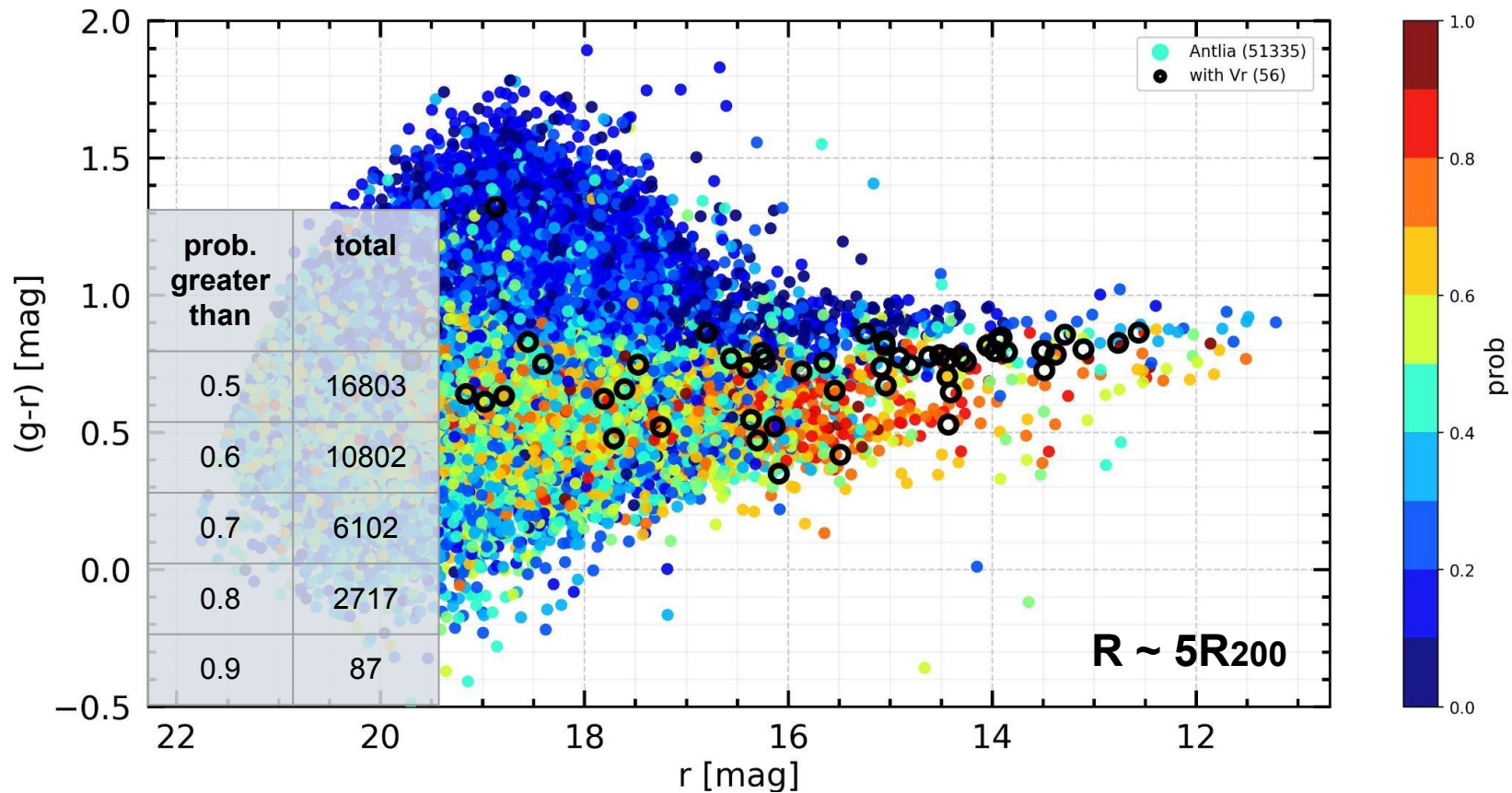# The Antlia Cluster

The Antlia Cluster: S-PLUS

The Antlia Cluster: S-PLUS

prob. greater than	total
0.5	16803
0.6	10802
0.7	6102
0.8	2717
0.9	87

R ~ 5R$_{200}$

Summary

- We have DECam data from the Antlia Cluster that cover almost a distance of R_{200} from the center. Using SExtractor photometry (including the R_{fiber} aperture), we select targets taking into account the dispersion of the CMR.

- We test another approach for target selection using PCA + RF in S-PLUS data.

- TODO: Test UMAP instead of PCA. Use different set of features. Suggestions?

Summary

Using DECam $\lesssim$ R200   < 20.5 mag   dispersion from CMR

	bluer than	redder than	total
1σ	708	735	1143
2σ	1398	1125	2523
3σ	2003	1253	3256
4σ	2584	1309	3893

Using S-PLUS   ~5R200   < 20.5 mag   PCA + RF

prob. greater than	total
0.5	16803
0.6	10802
0.7	6102
0.8	2717
0.9	87