



# THE FORNAX DEEP SURVEY WITH VST

## SURFACE PHOTOMETRY OF LTGs INSIDE THE VIRIAL RADIUS OF THE FORNAX CLUSTER

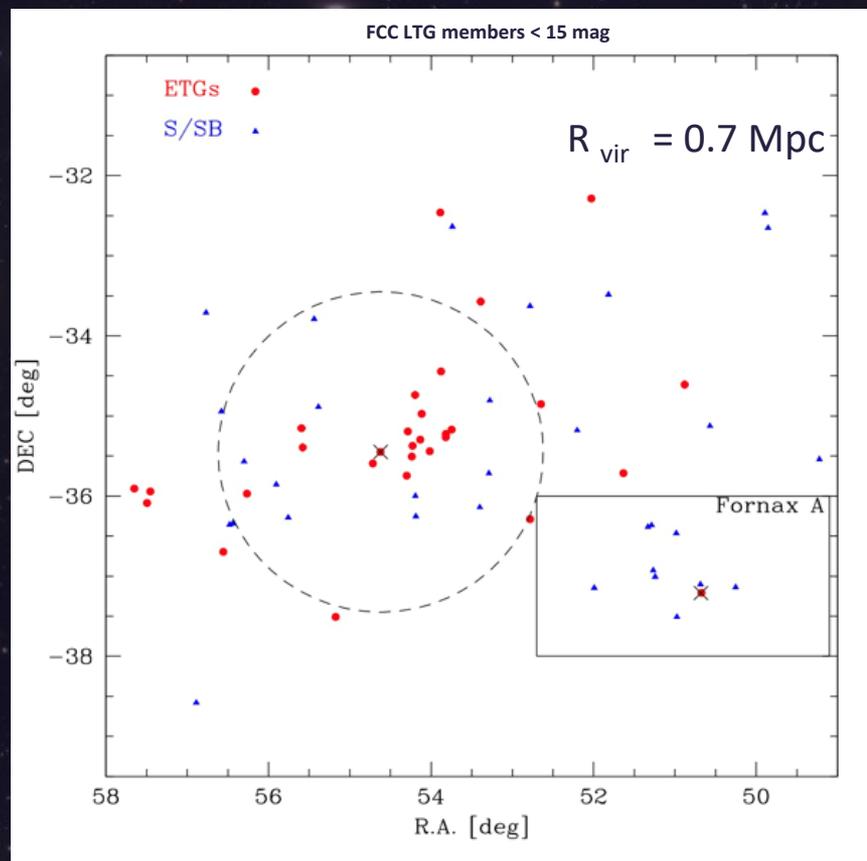
M.A.Raj, E.Iodice, N.R.Napolitano et al. 2018, in prep

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## Purpose

- Galaxy structure
- Colour vs cluster centre distance





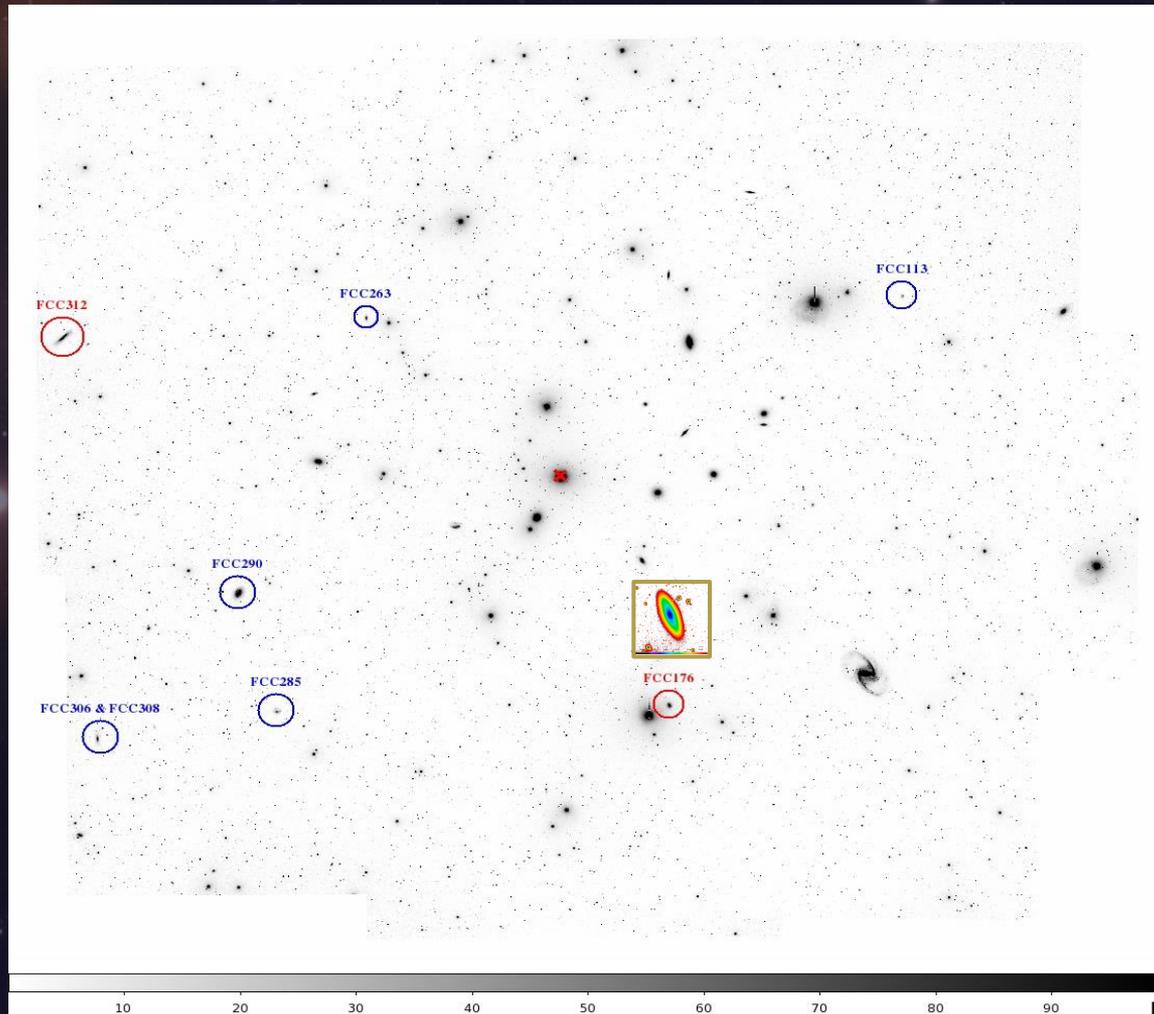
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## FDS LTGs Overview

- The LTGs presented in this work are brighter than  $m_B < 15$  mag inside the virial radius of the Fornax Cluster
- Deep multi-band images and high resolution of the FDS data allow us to map the light distribution and colour down to a mag of 28-30 mag in g and 28-29 mag in I bands.
- For the purpose of this research, we extracted the (i) azimuthally-averaged intensity profiles for each object from the sky-subtracted images in four respective bands, (ii) the position angle (PA), and ellipticity profiles (iii) g-i colour profiles, and as a function of projected distance from the cluster centre.
- We derive the  $M_{\text{tot}}$ , Re, g-i colours

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## Results

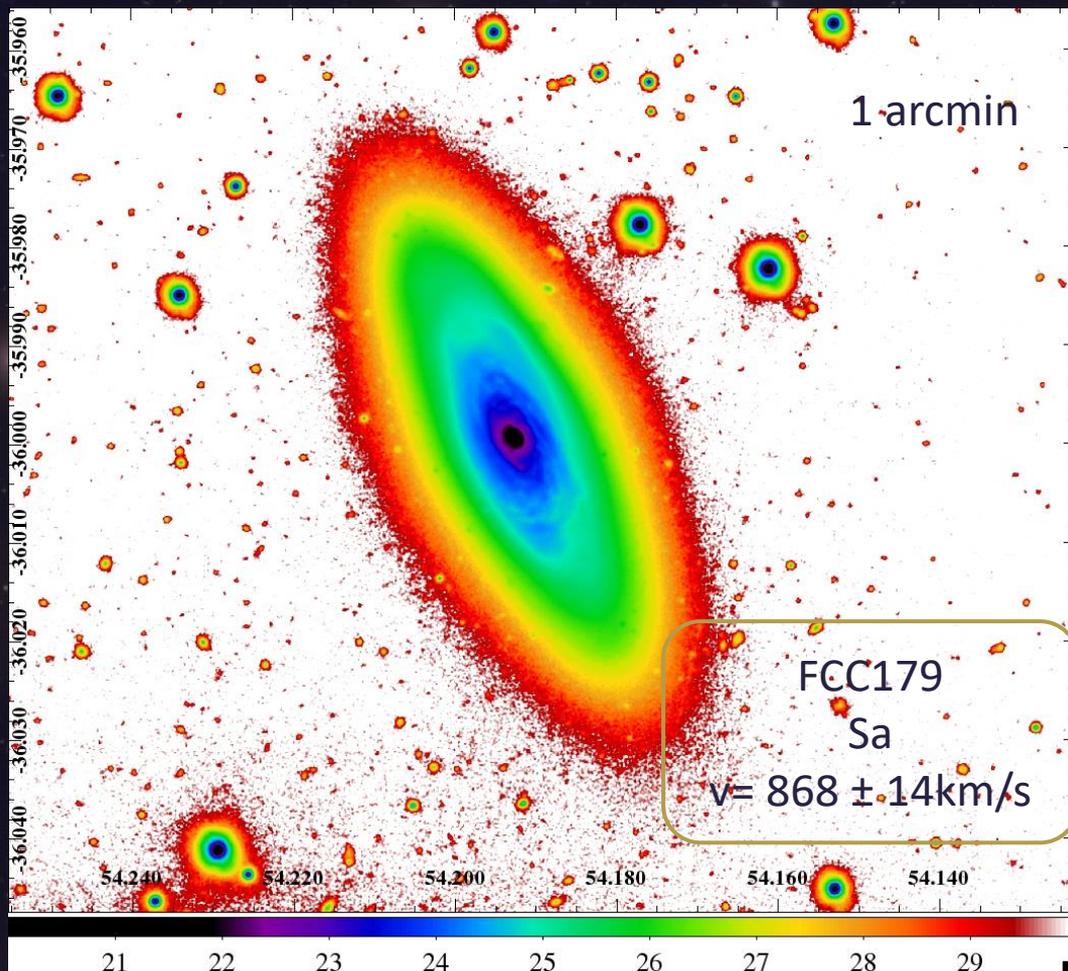
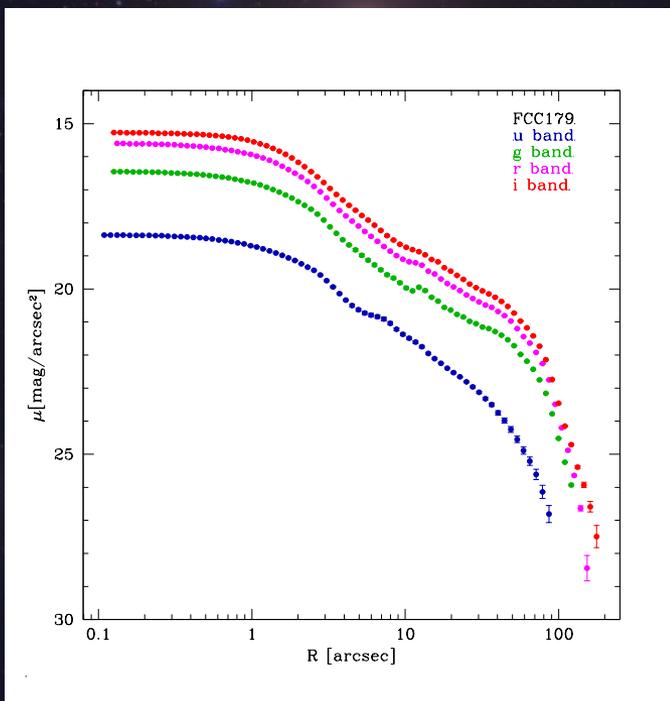




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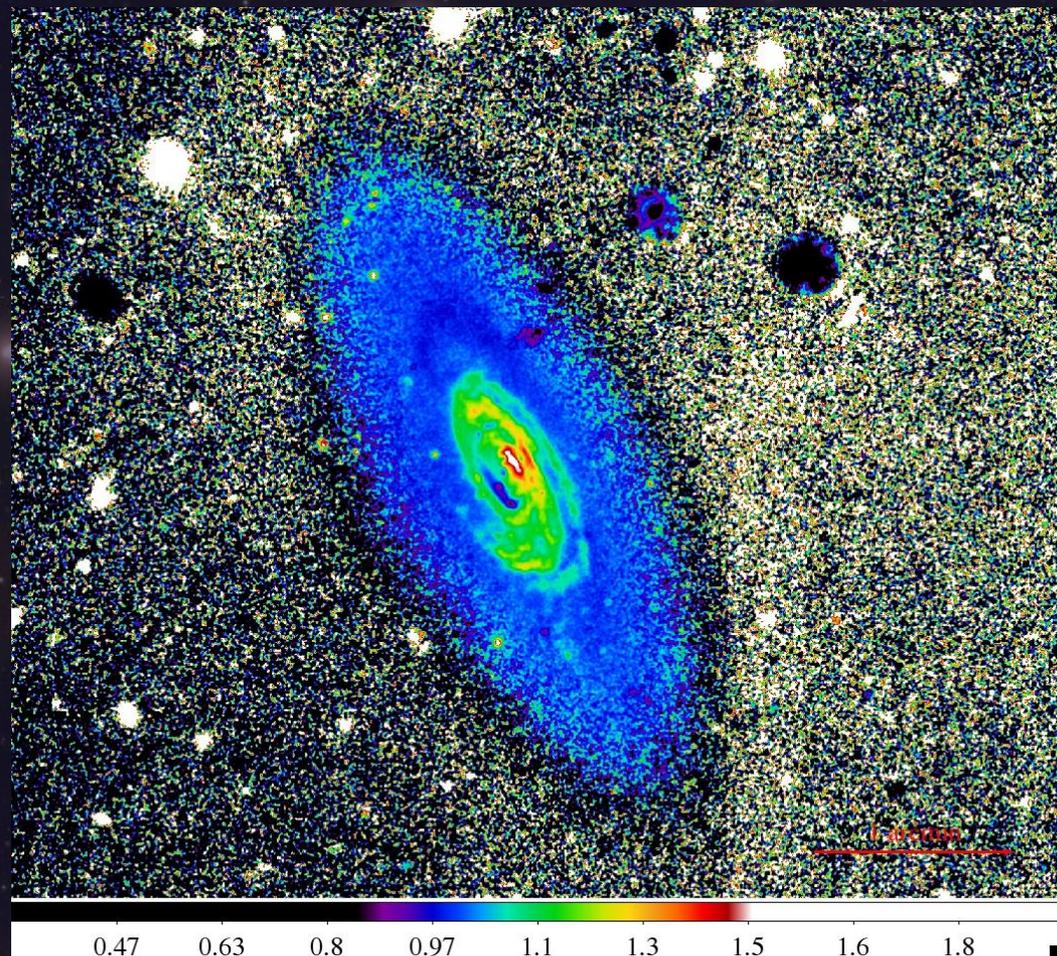
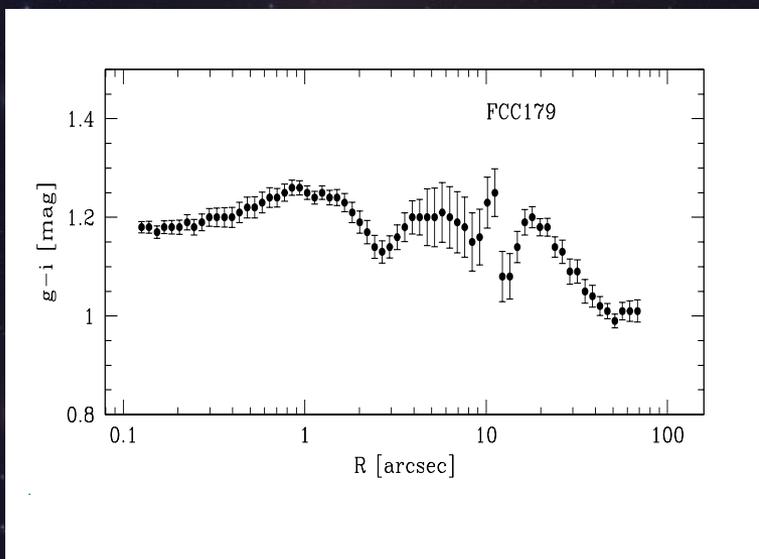
FCC179

- AGN
- A lot of dust in the spiral arms (can be seen in the g-i colour map), but only concentrated in the central regions



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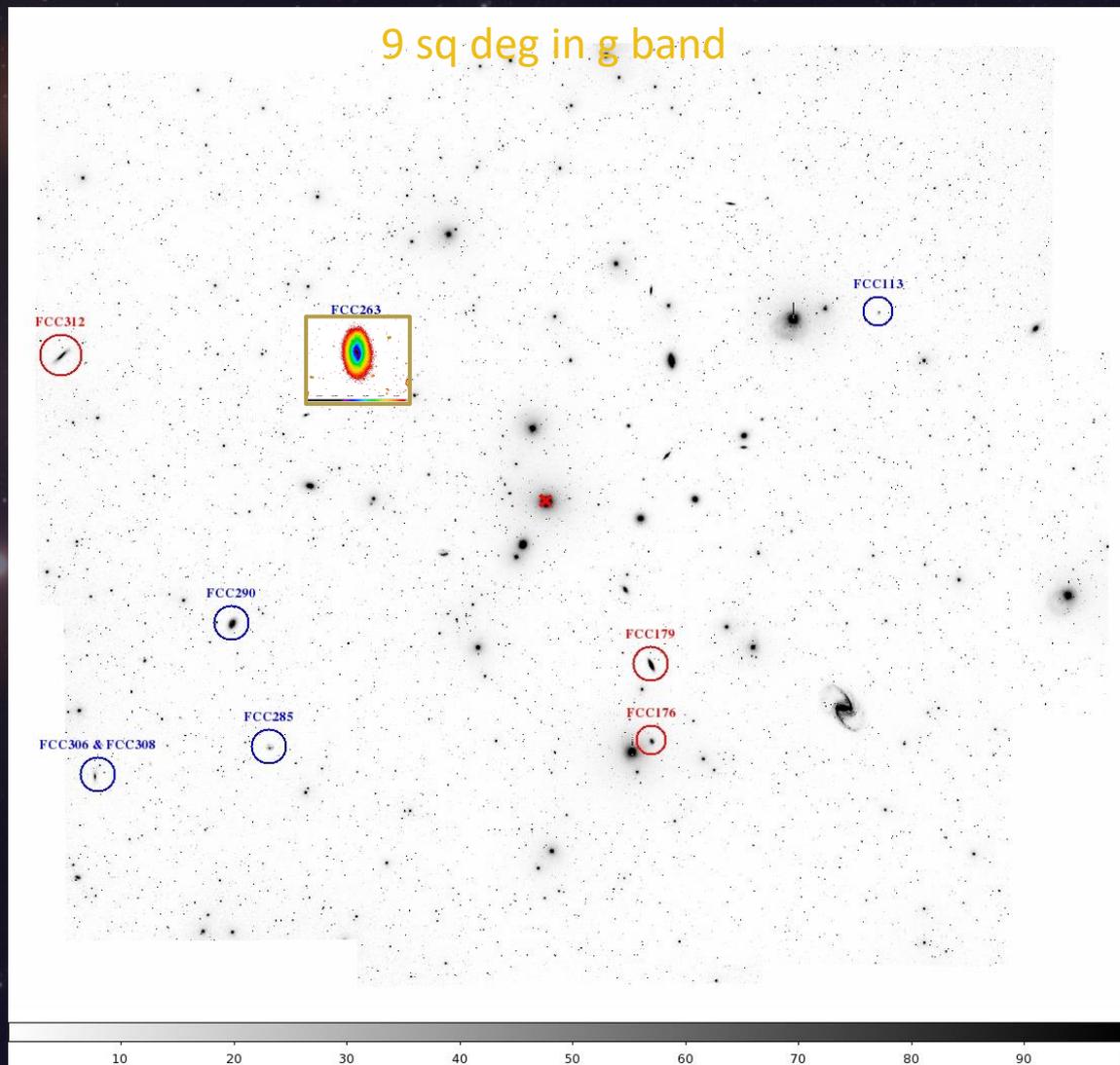
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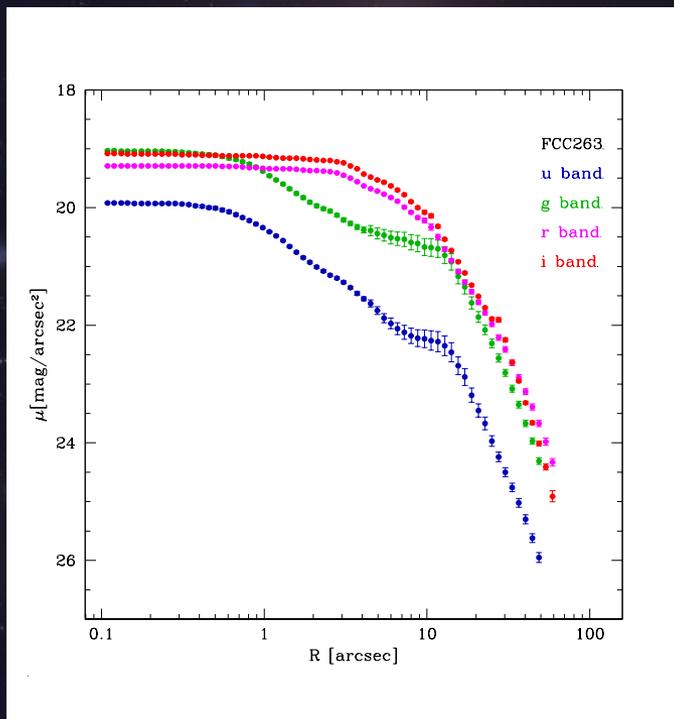
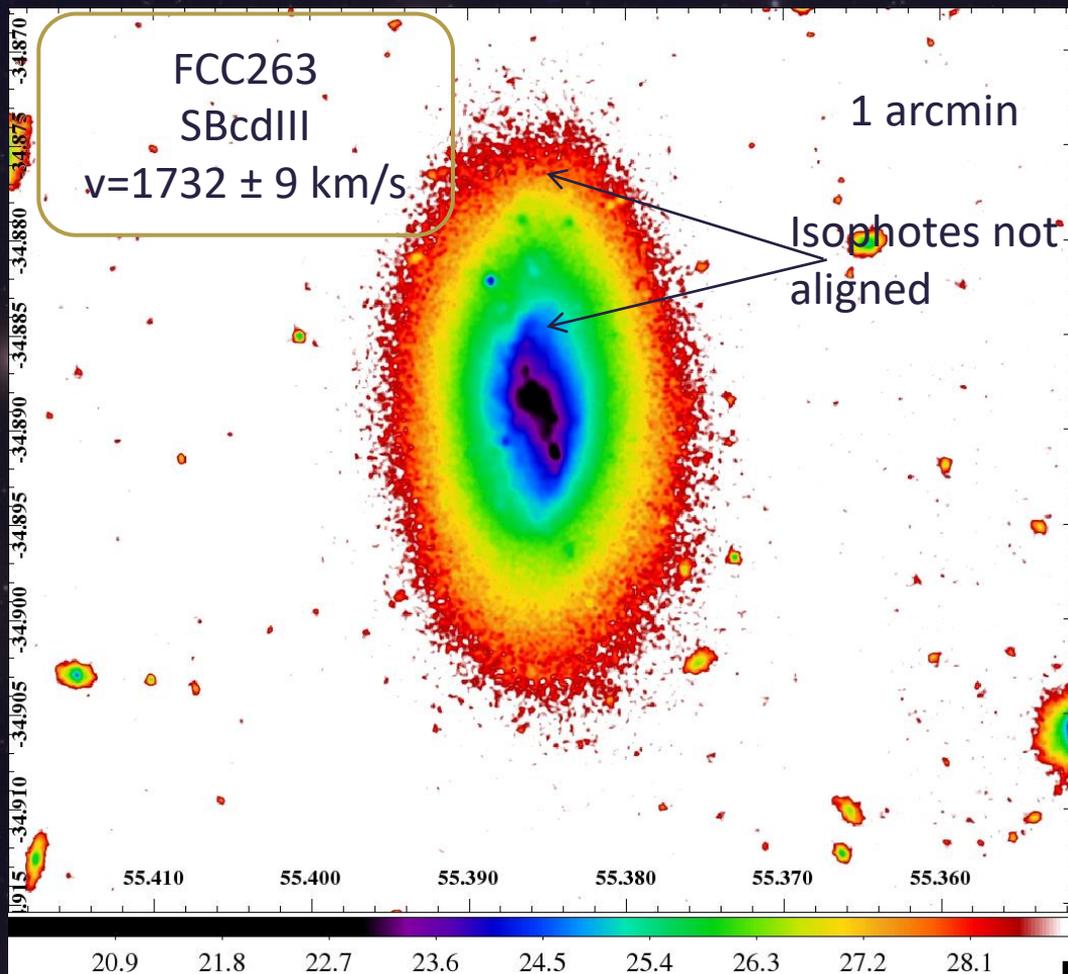
9 sq deg in g band



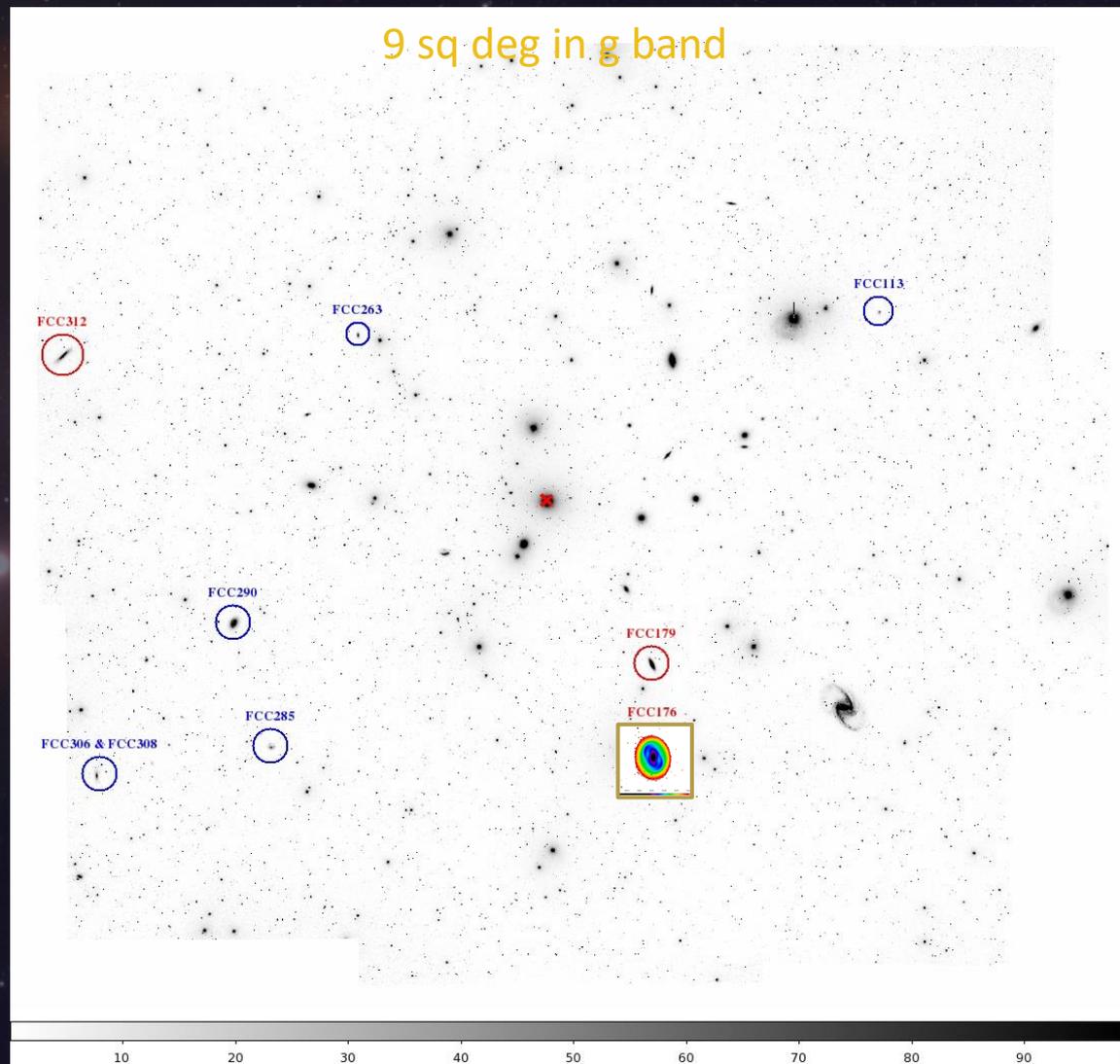
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- Dust lane in the centre
- Spiral arms concentrated only in the central regions

FCC263



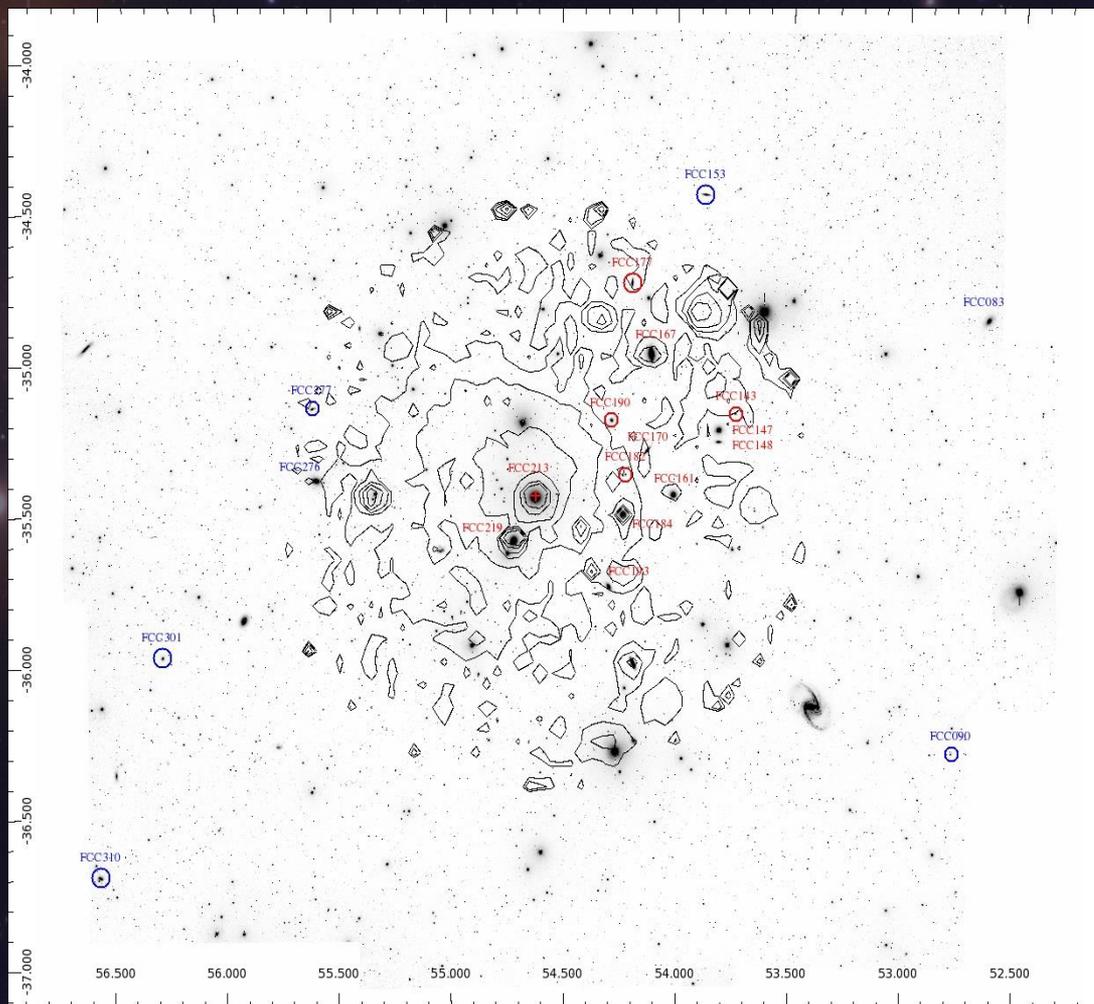
# THE FORNAX DEEP SURVEY WITH VST





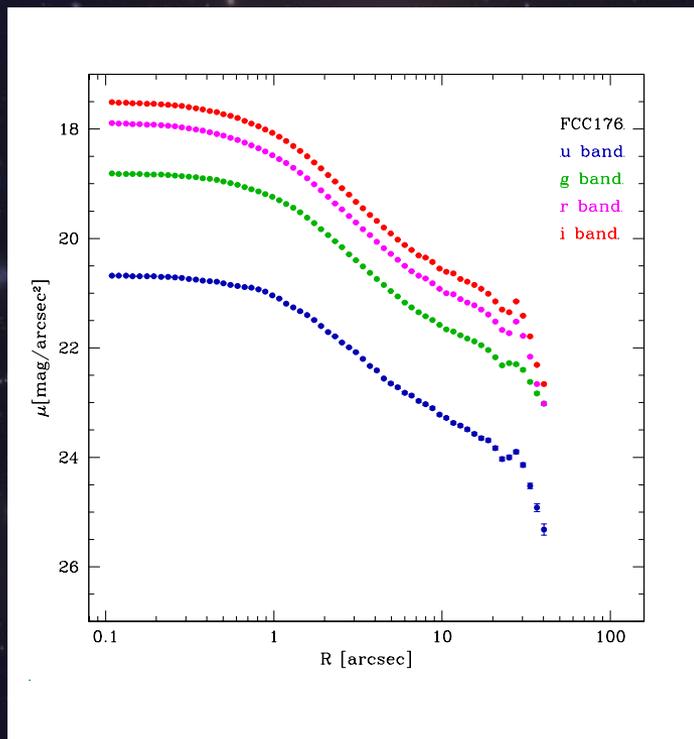
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## X-ray map from ROSAT

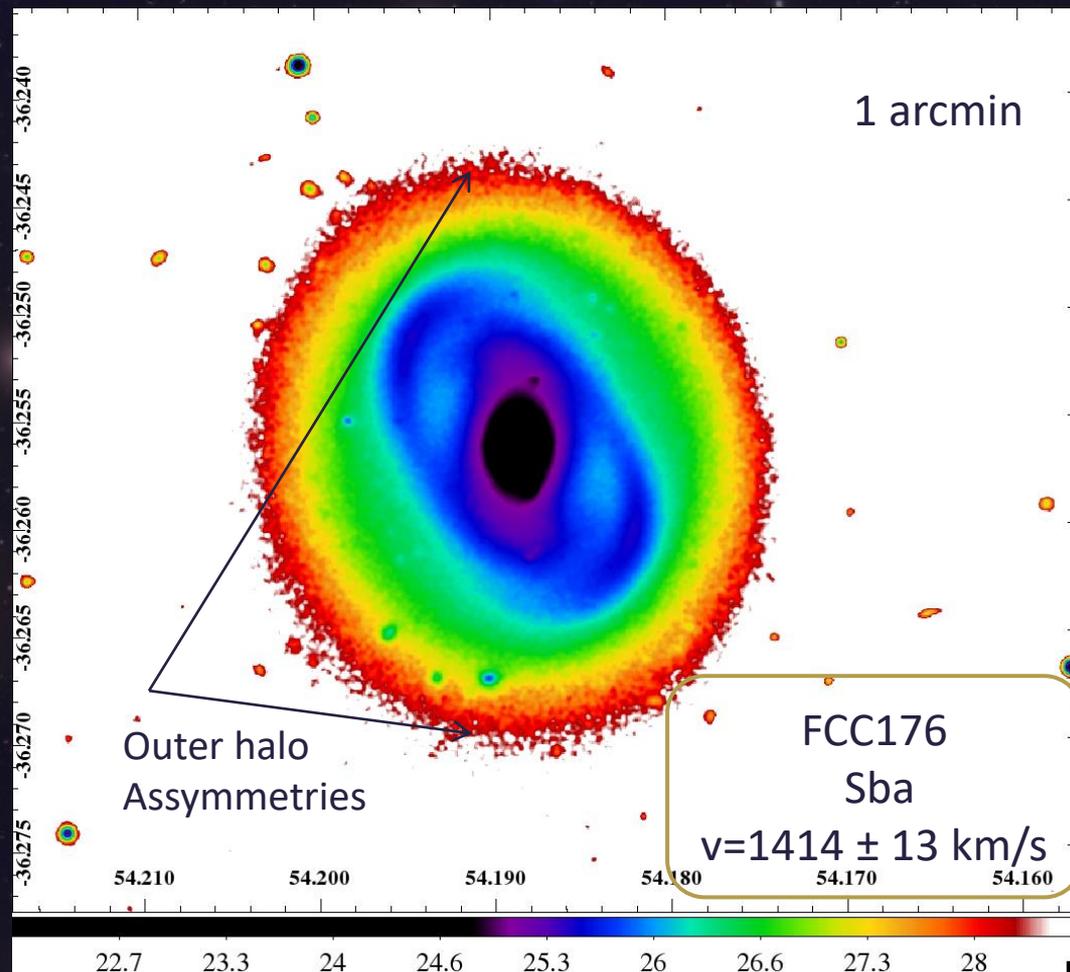


# THE FORNAX DEEP SURVEY WITH VST

- Bar-ring, asymmetric halo
- In the X-ray region, S0 barred

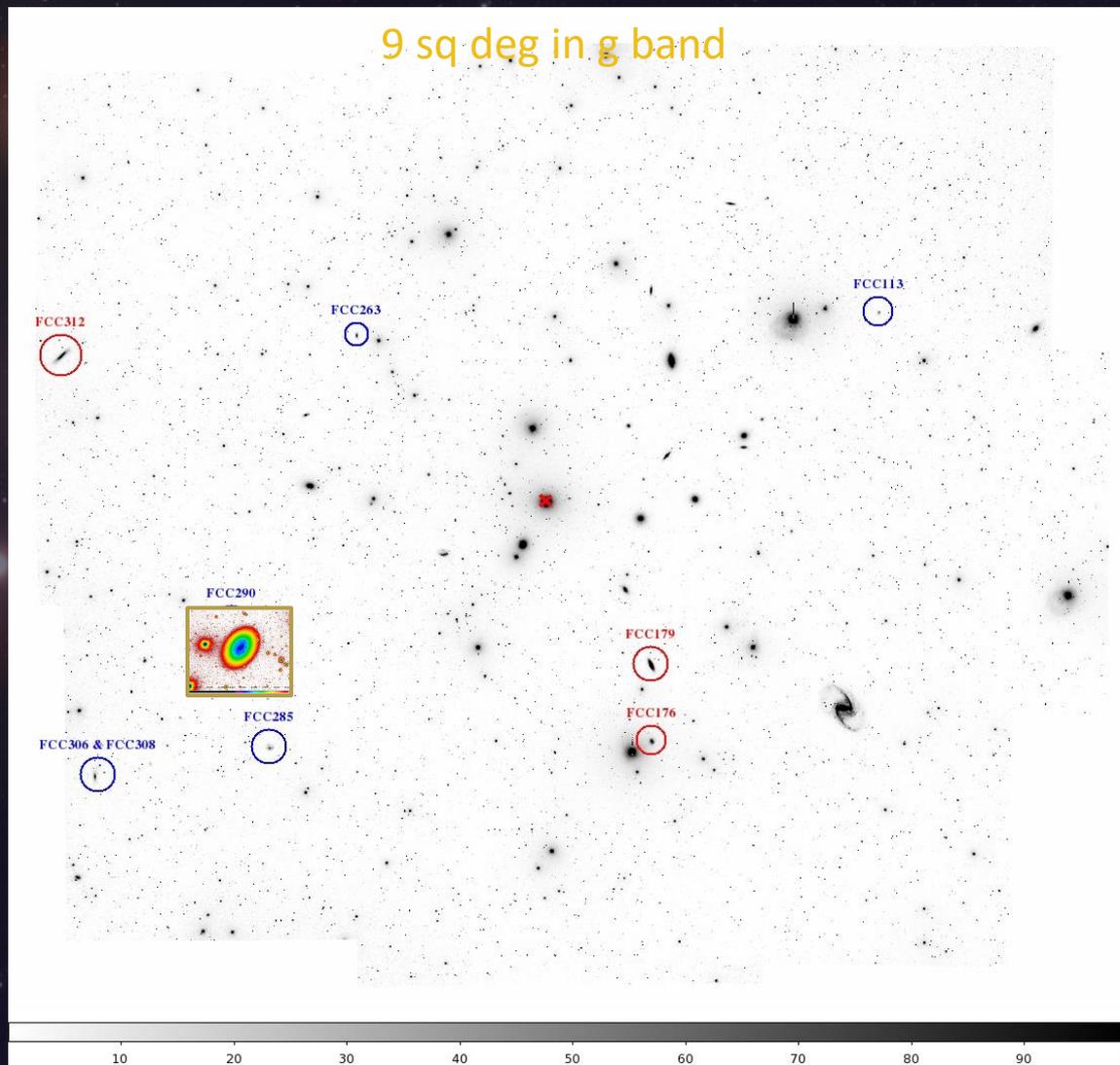


FCC176



# THE FORNAX DEEP SURVEY WITH VST

9 sq deg in g band

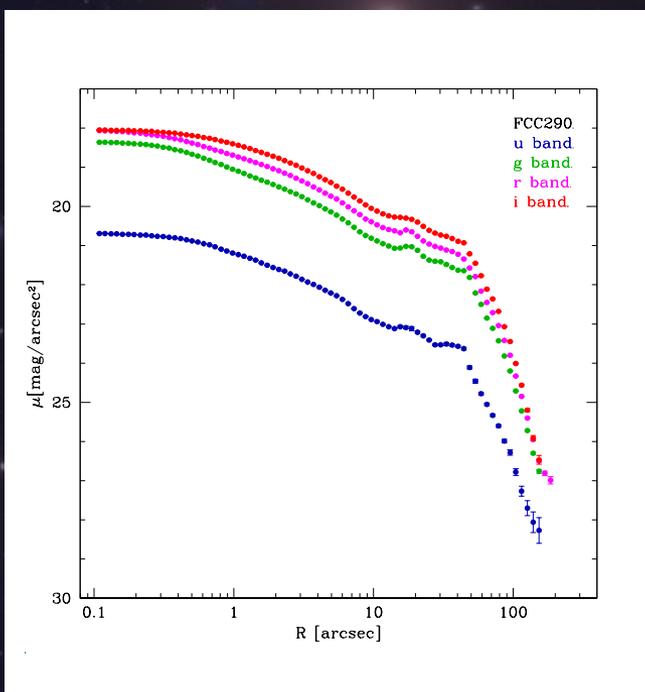
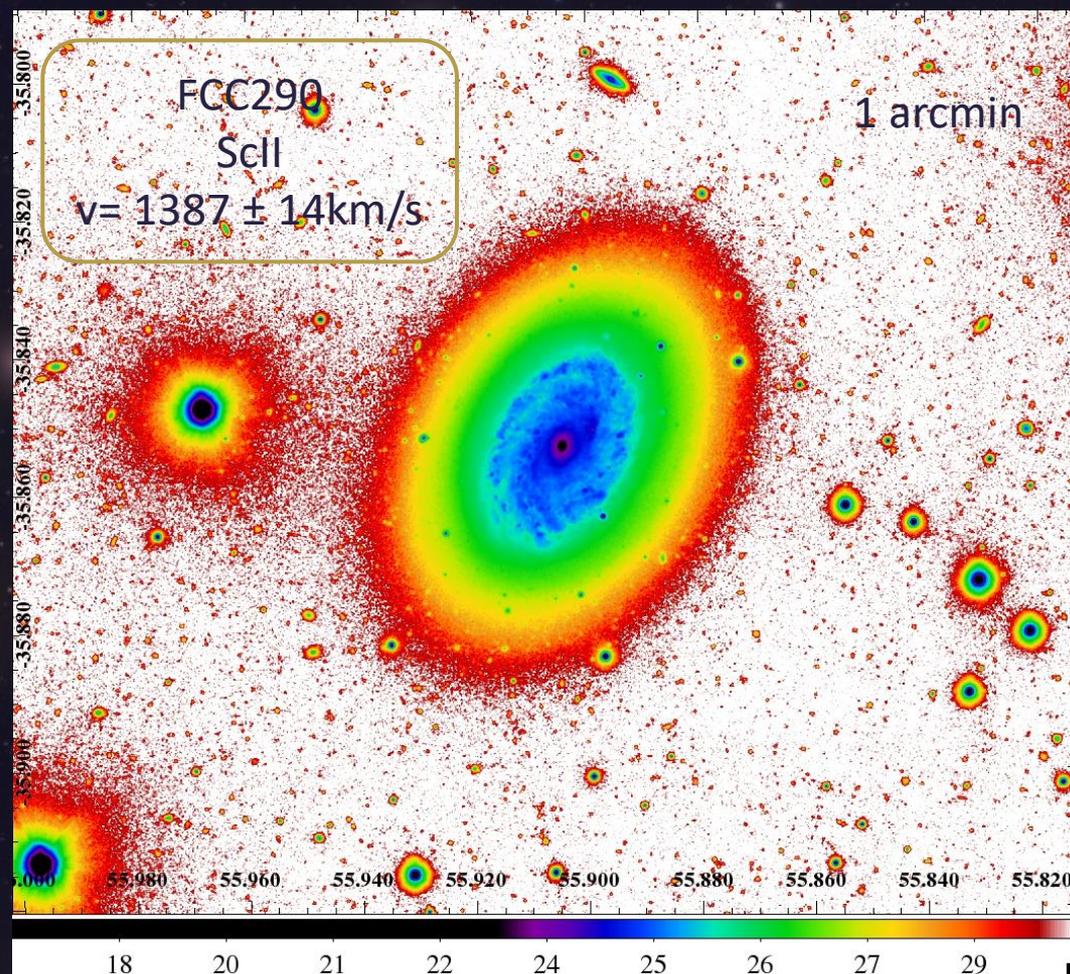




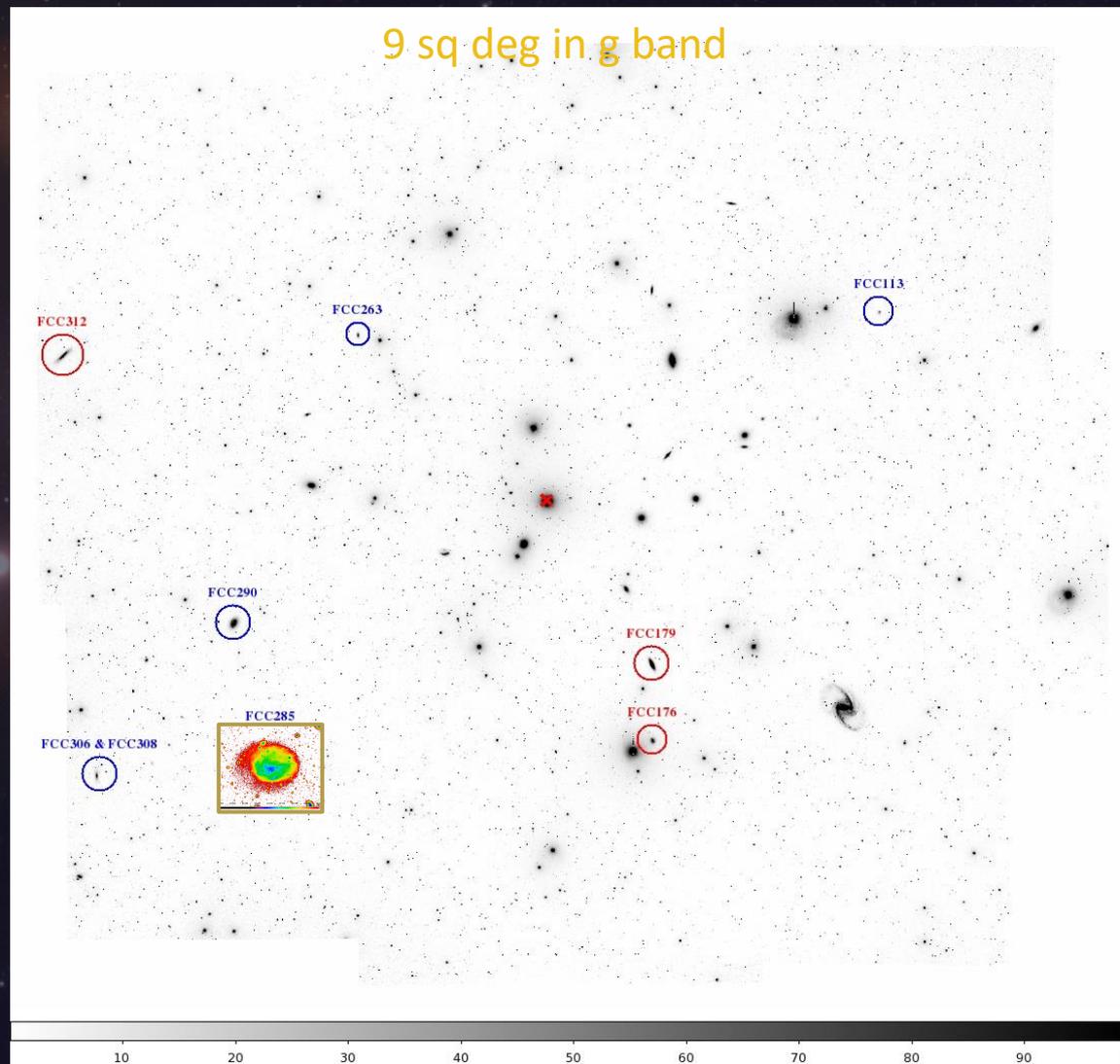
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## FCC290

- Central spiral arms, outer regions like an S0 galaxy.
- X-ray regions, but has a regular shape



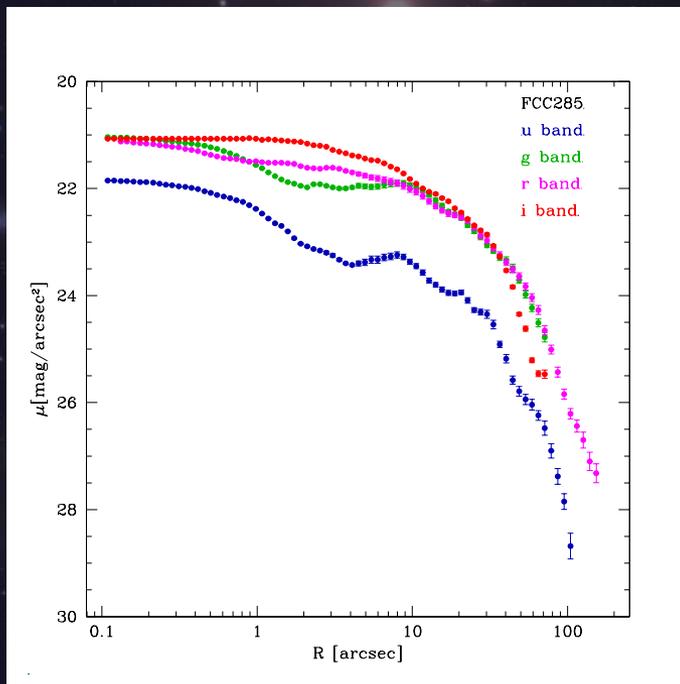
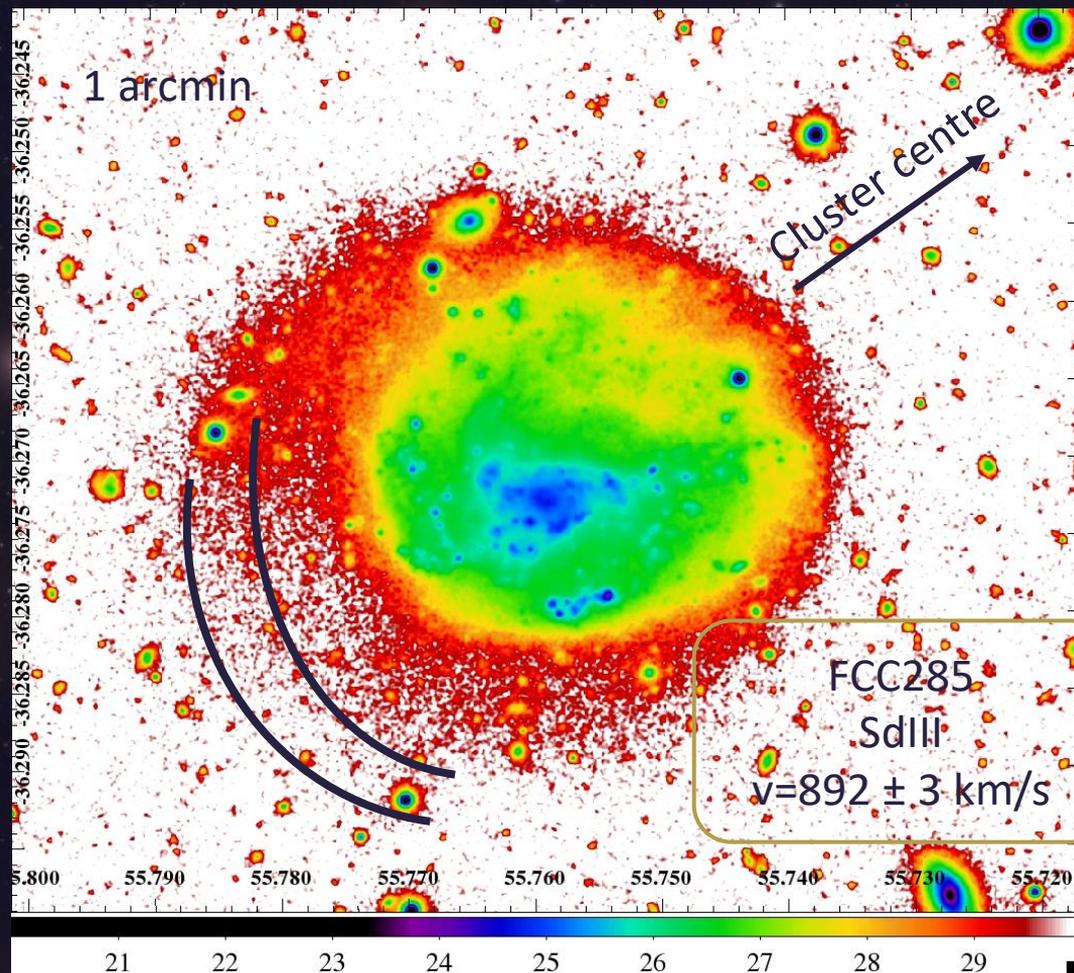
# THE FORNAX DEEP SURVEY WITH VST



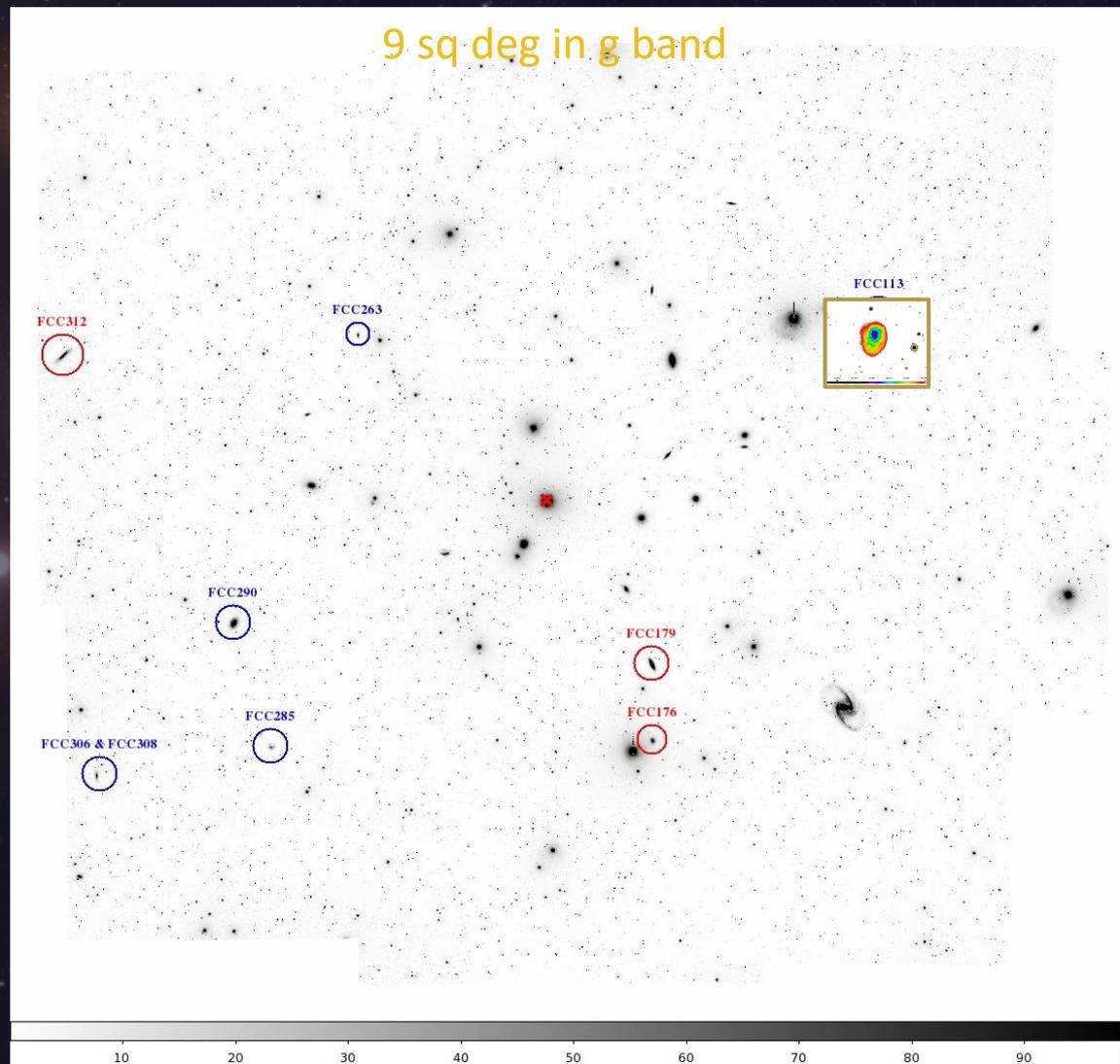
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- Lopsided
- Faint spiral arms, irregular star formation regions (knots)

FCC285

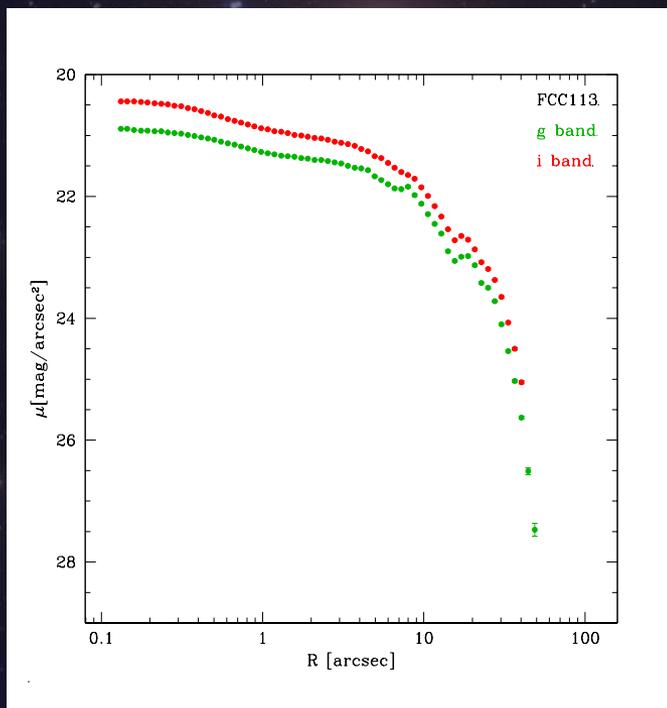


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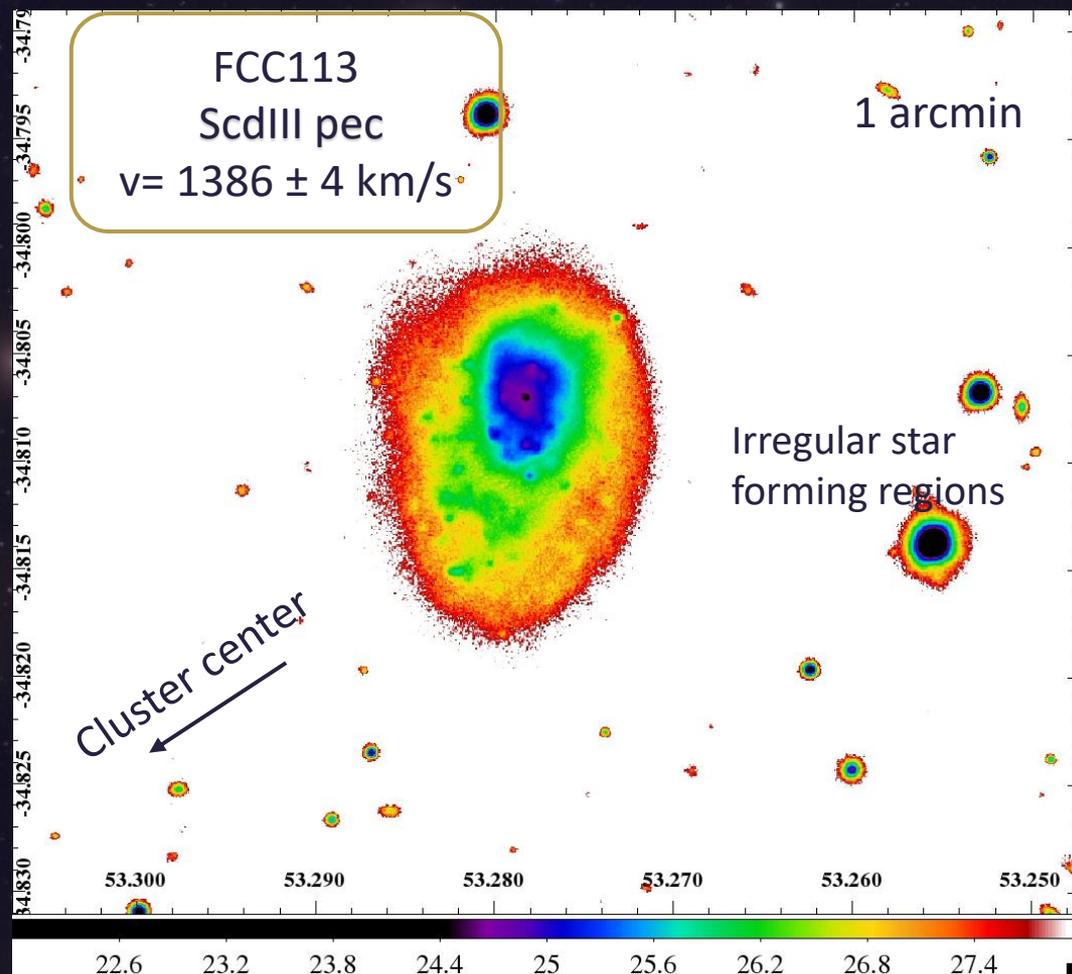


# THE FORNAX DEEP SURVEY WITH VST

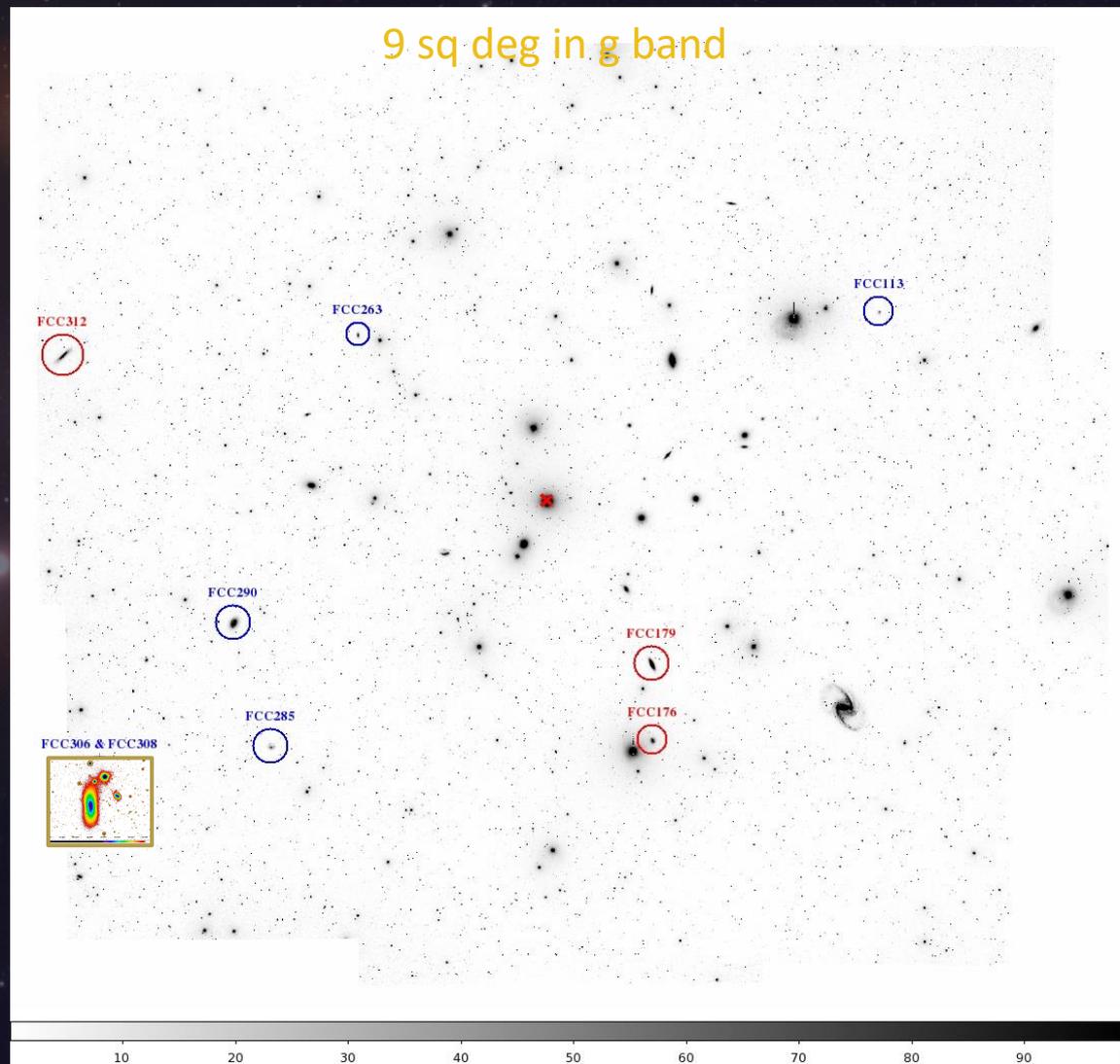
- lopsided
- Bluer, displays sub structures that have retained. Star forming regions (knots)



FCC113



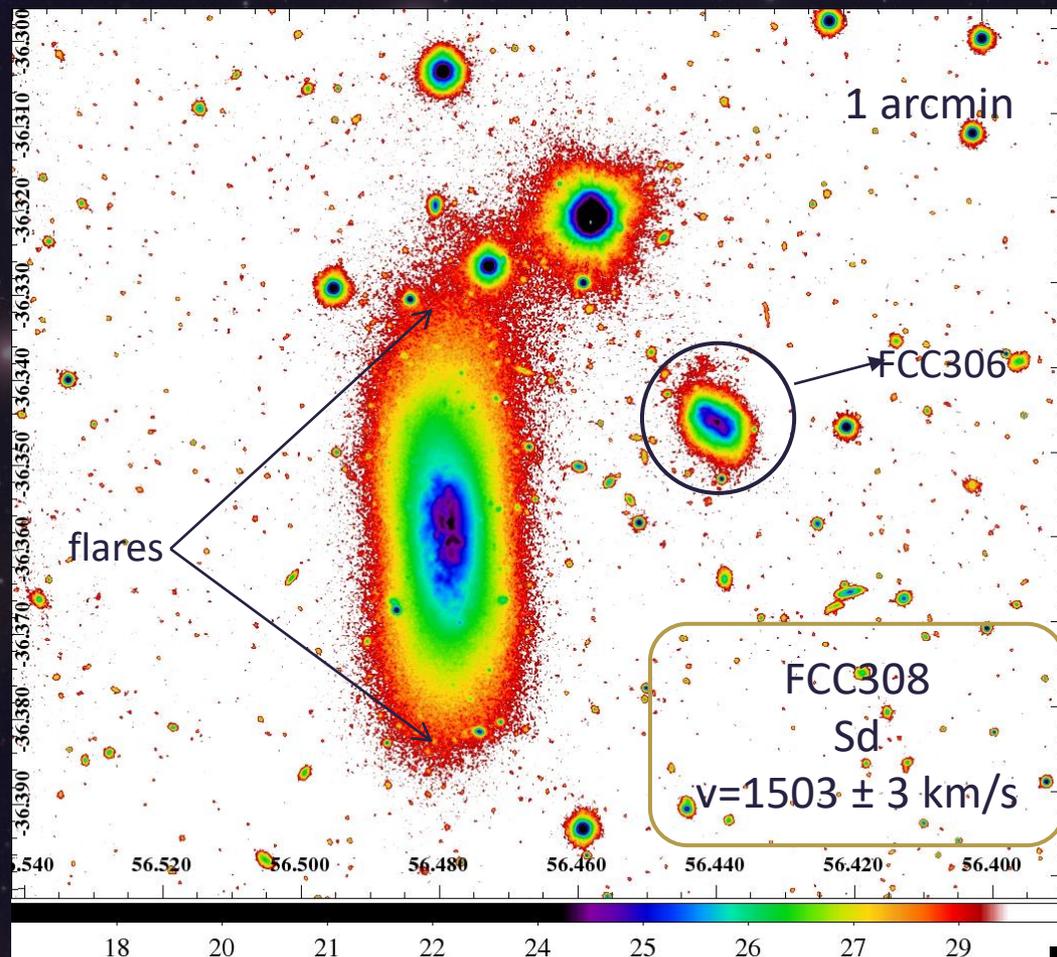
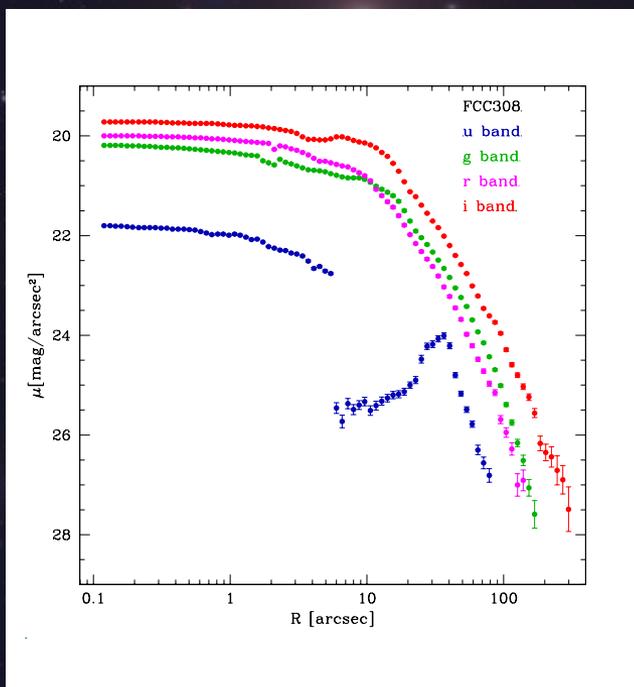
# THE FORNAX DEEP SURVEY WITH VST



# THE FORNAX DEEP SURVEY WITH VST

- Ill-defined spiral arms
- Star forming regions unevenly distributed. Dust distribution can be seen in g-i colour map.

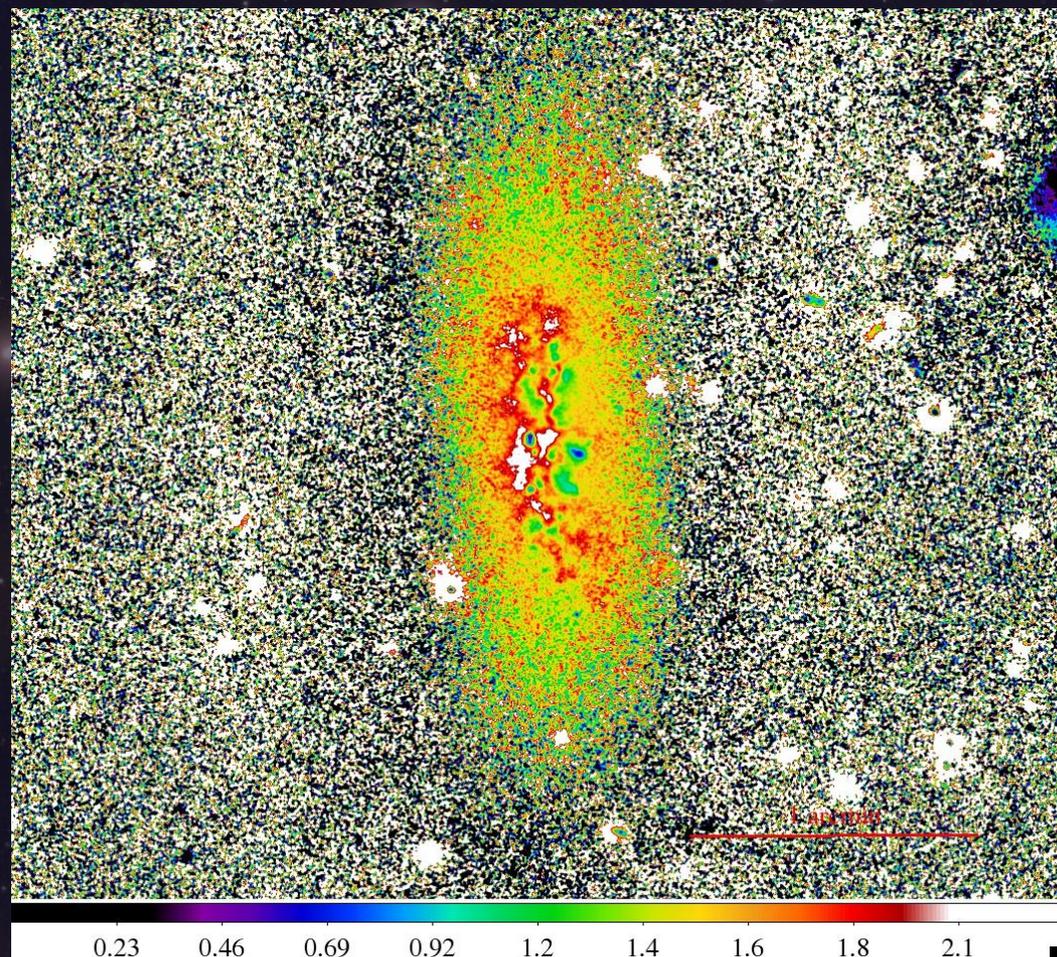
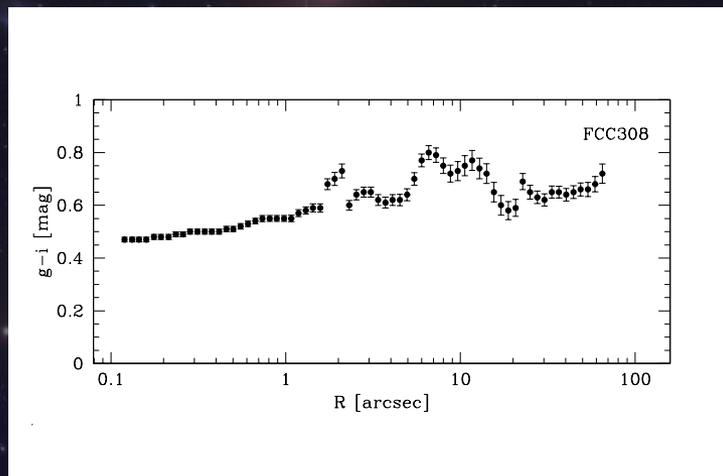
FCC308





# THE FORNAX DEEP SURVEY WITH VST

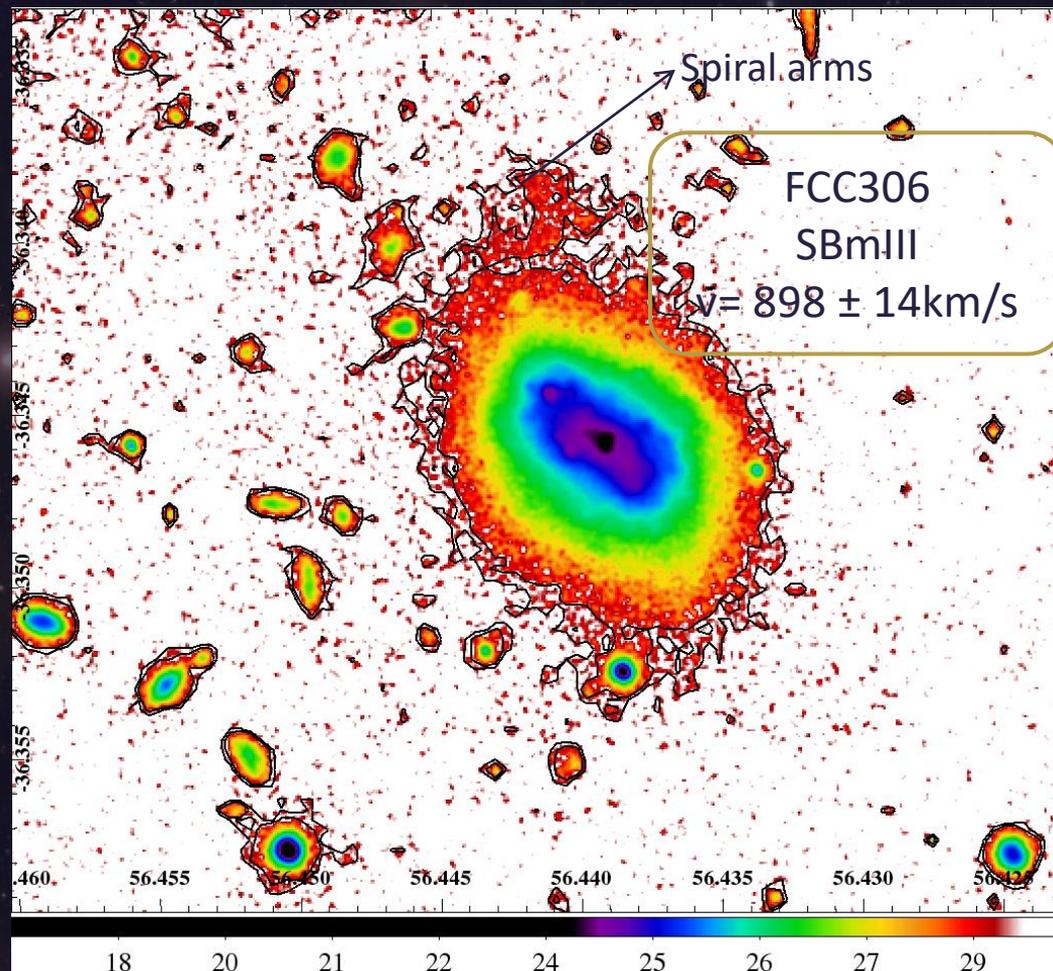
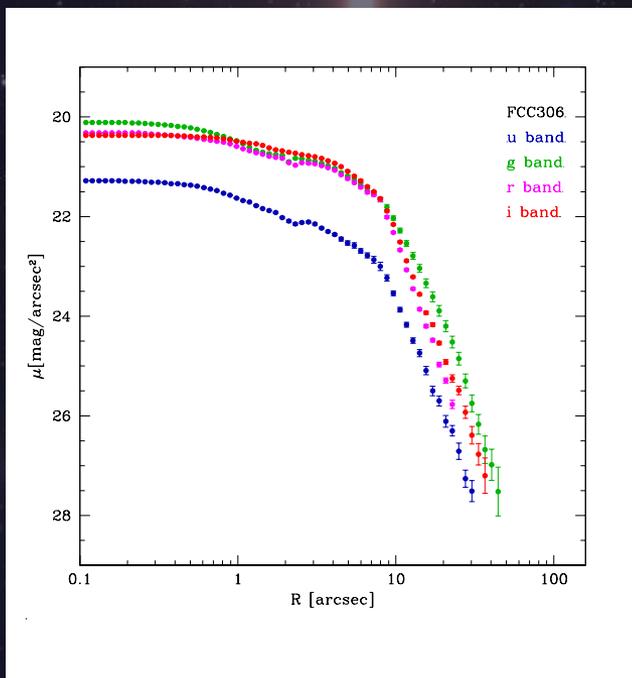
FCC308



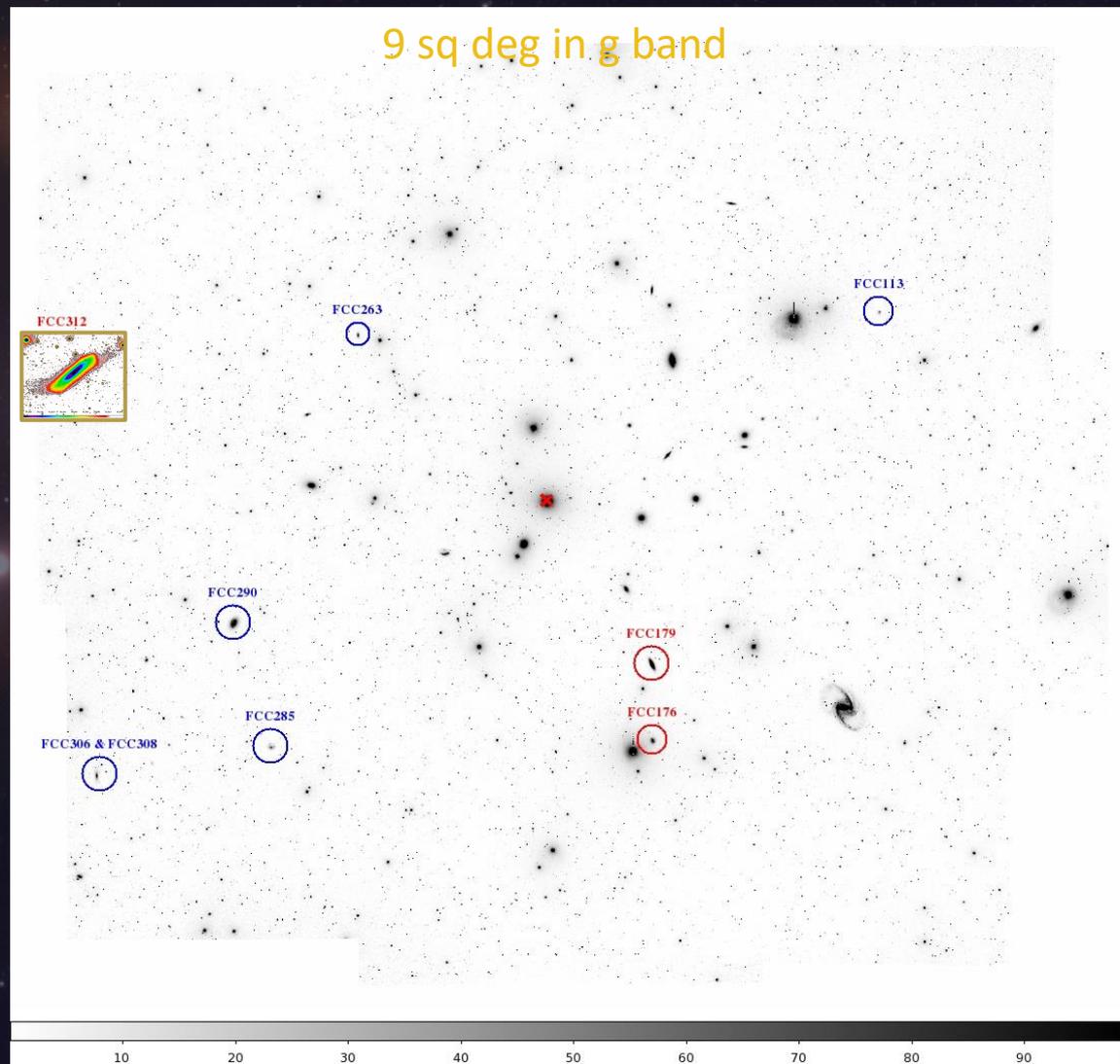
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## FCC306

- Faintest galaxy in the sample
- Irregular, and faint spiral arms (NE). No substructure evidence, only speculation



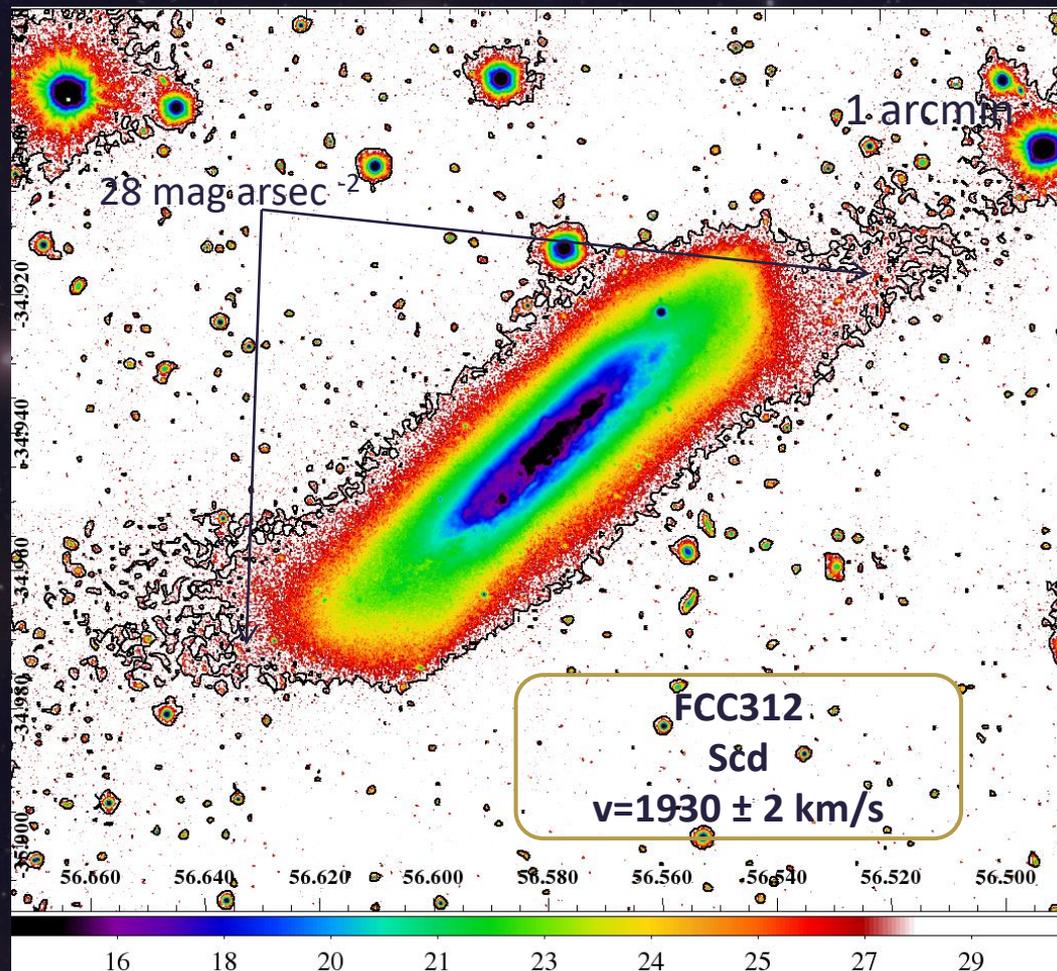
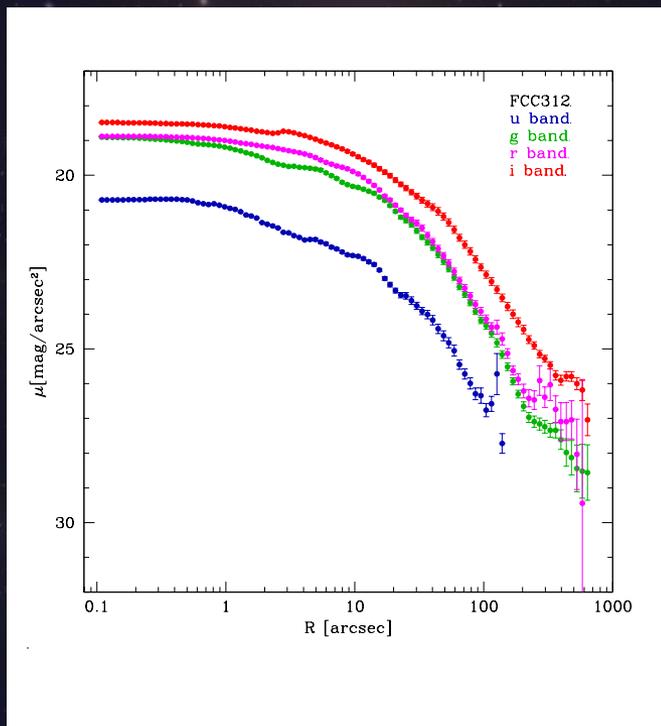
# THE FORNAX DEEP SURVEY WITH VST



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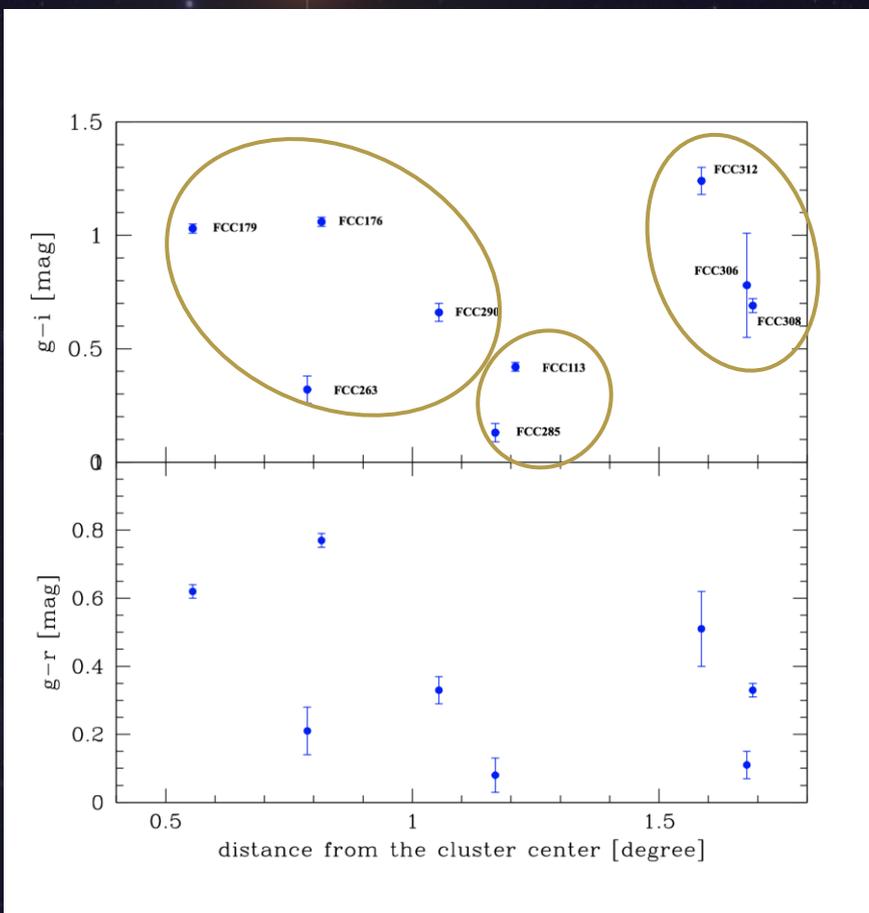
- Brightest in the sample
- Extended spiral arms, boxy-edge, extended disk. High star forming regions in the centre.

## FCC312



# THE FORNAX DEEP SURVEY WITH VST

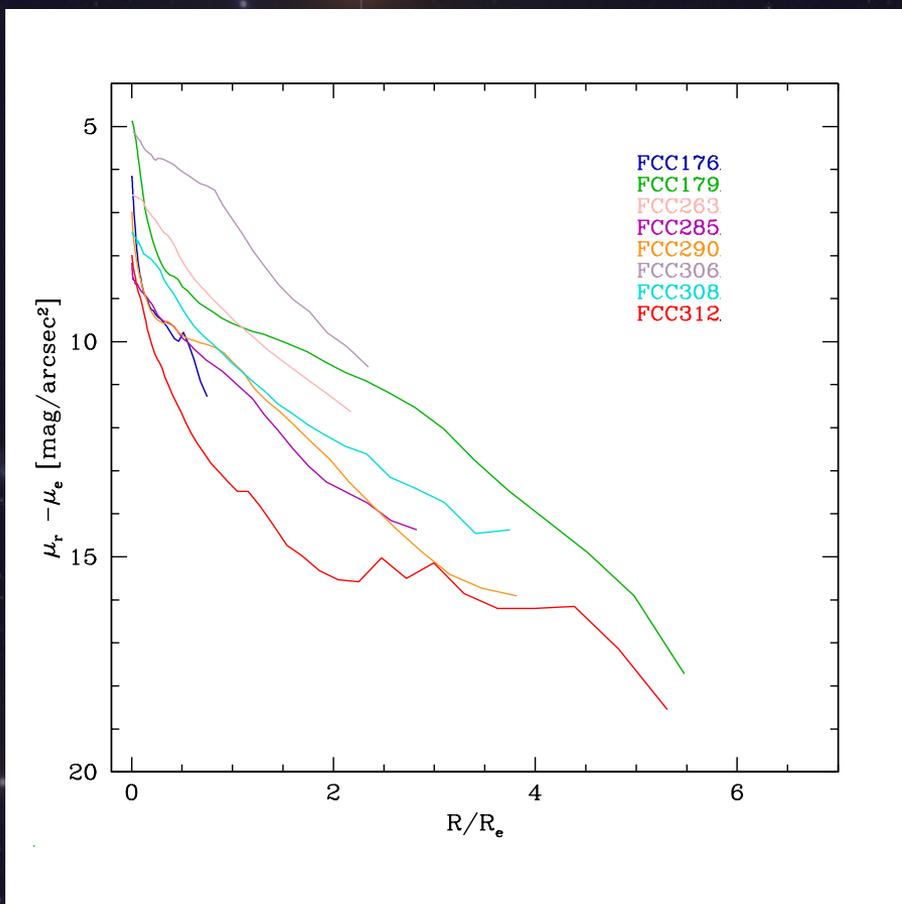
Colour as a function of distance from the cluster centre



- Galaxies close to the centre tend to show more redder colours, while galaxies far away tend to be bluer.
- Except for a few cases like FCC306, FCC308, FCC312
- The higher density regions of the central cluster have an effect on the evolution of the galaxy: ram-pressure stripping, strangulation, star formation quenching.
- The outer regions (low density) can be one of the reasons for the irregular shape of the LTGs.
- Some lopsided galaxies show the effect of the galaxy being stripped or pulled into the central regions by the gravitational potential well.

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Global view of the LTGs inside the virial radius of the Fornax Cluster



- M/L ratios
- Structure of the discs
- Evolution of the discs, as a function of the position in the cluster (cluster centre distance)
- Colours of the discs (central vs outer regions)

*To be continued..*