

# *New dSphs in the Virgo cluster core*

S. Lieder<sup>1,2</sup>, T. Lisker<sup>1</sup>, M. Hilker<sup>3</sup>, I. Misgeld<sup>4</sup>, P. Durrell<sup>5</sup>

<sup>1</sup> Zentrum für Astronomie, Heidelberg, Germany

<sup>2</sup> ESO Santiago

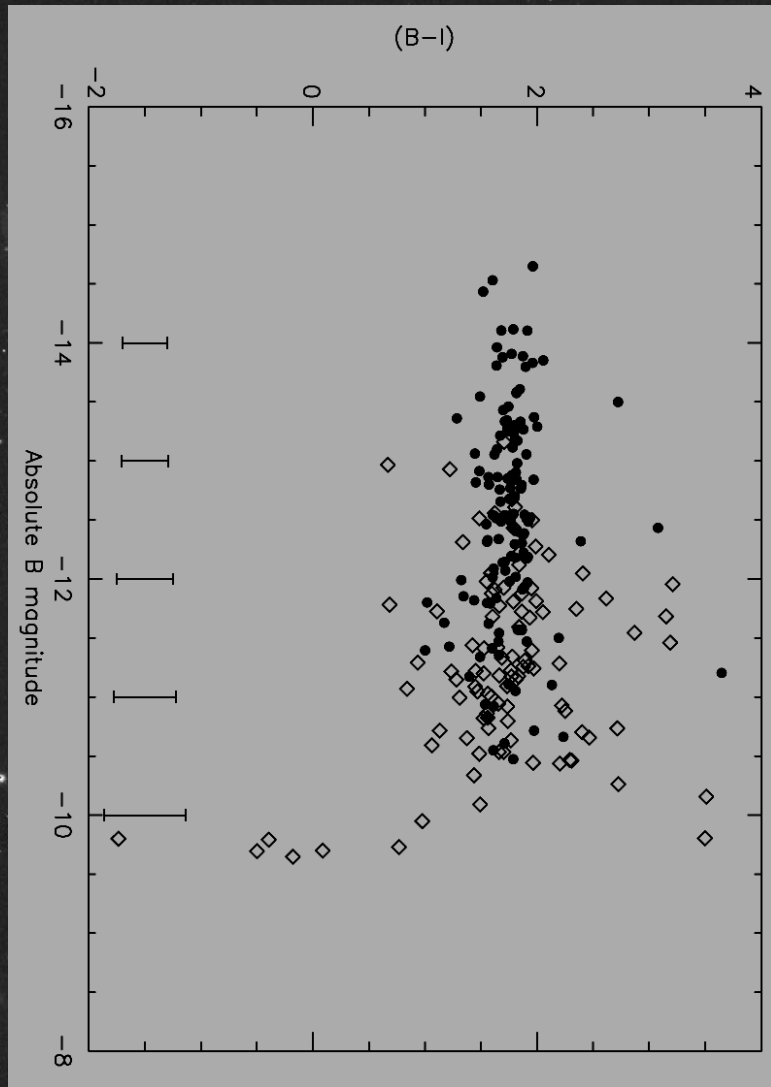
<sup>3</sup> ESO Garching

<sup>4</sup> Universitätssternwarte München

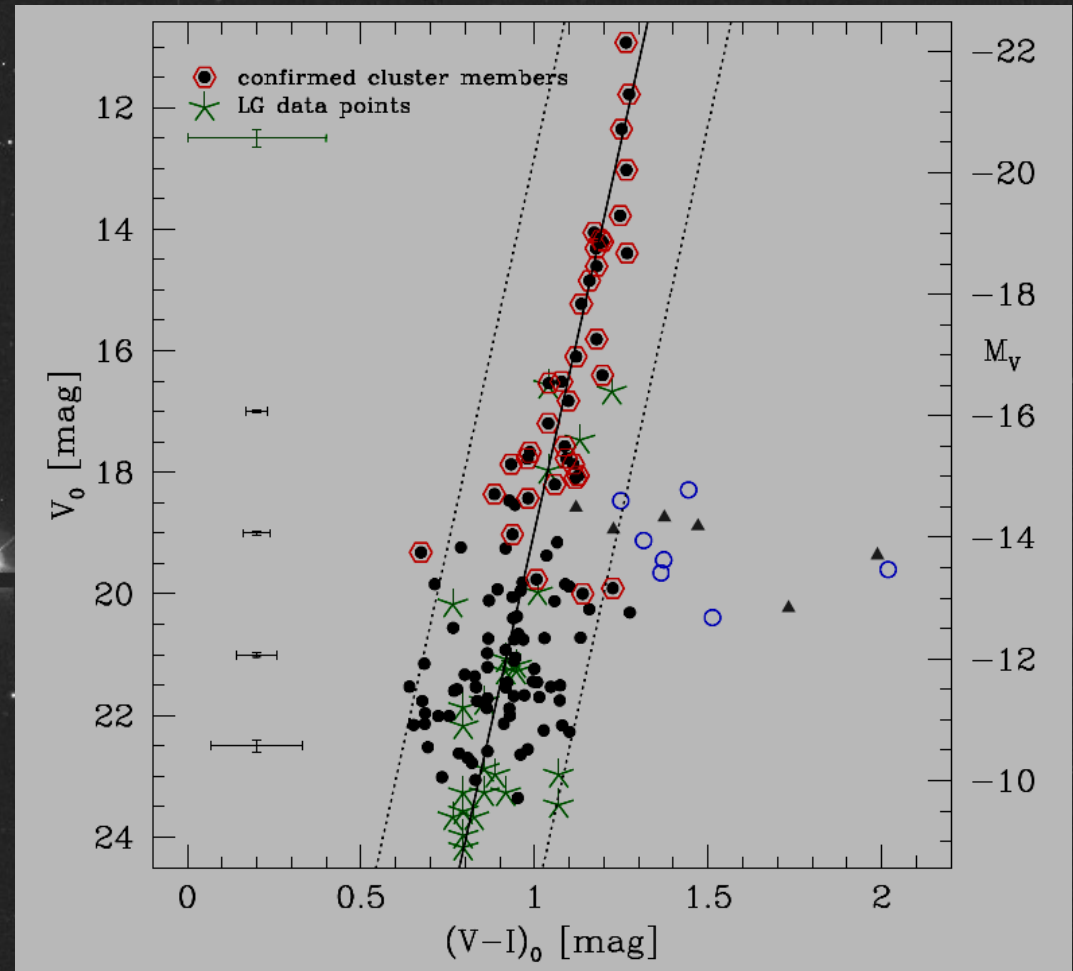
<sup>5</sup> Youngstown State University, Youngstown, OH

Submitted to A&A: S. Lieder et al. „A deep view on the Virgo cluster core“

# Galaxy clusters show a linear early type CMR

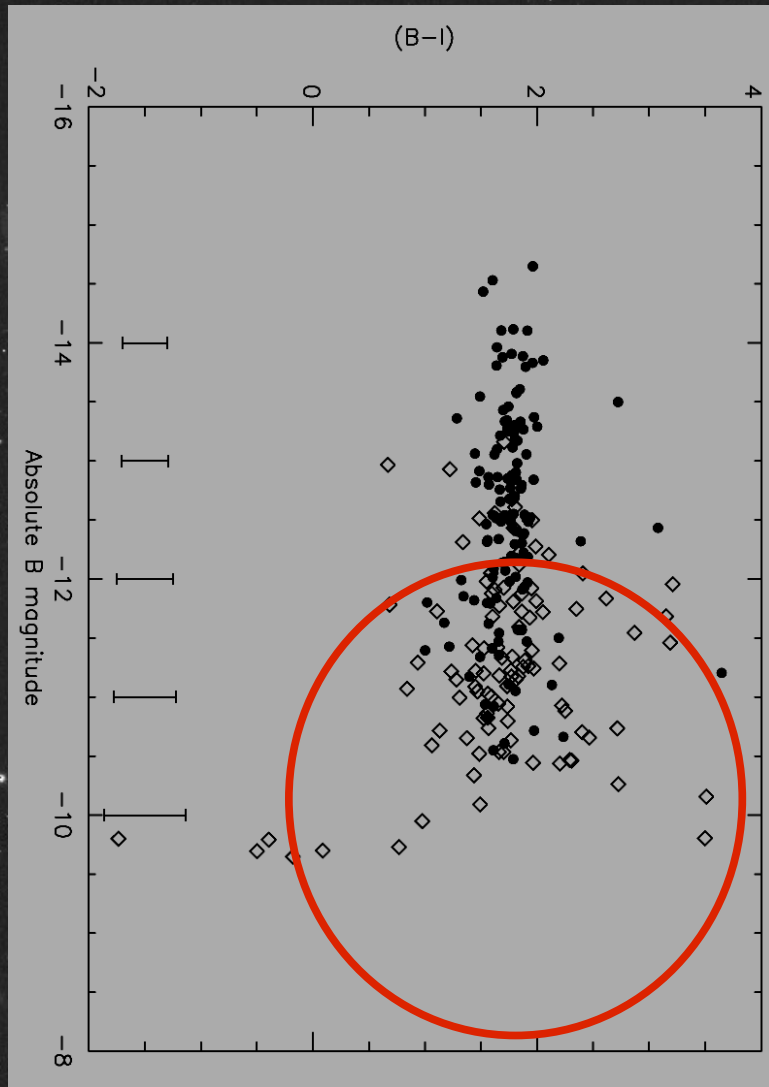


Virgo: Sabatini et al. (2005)

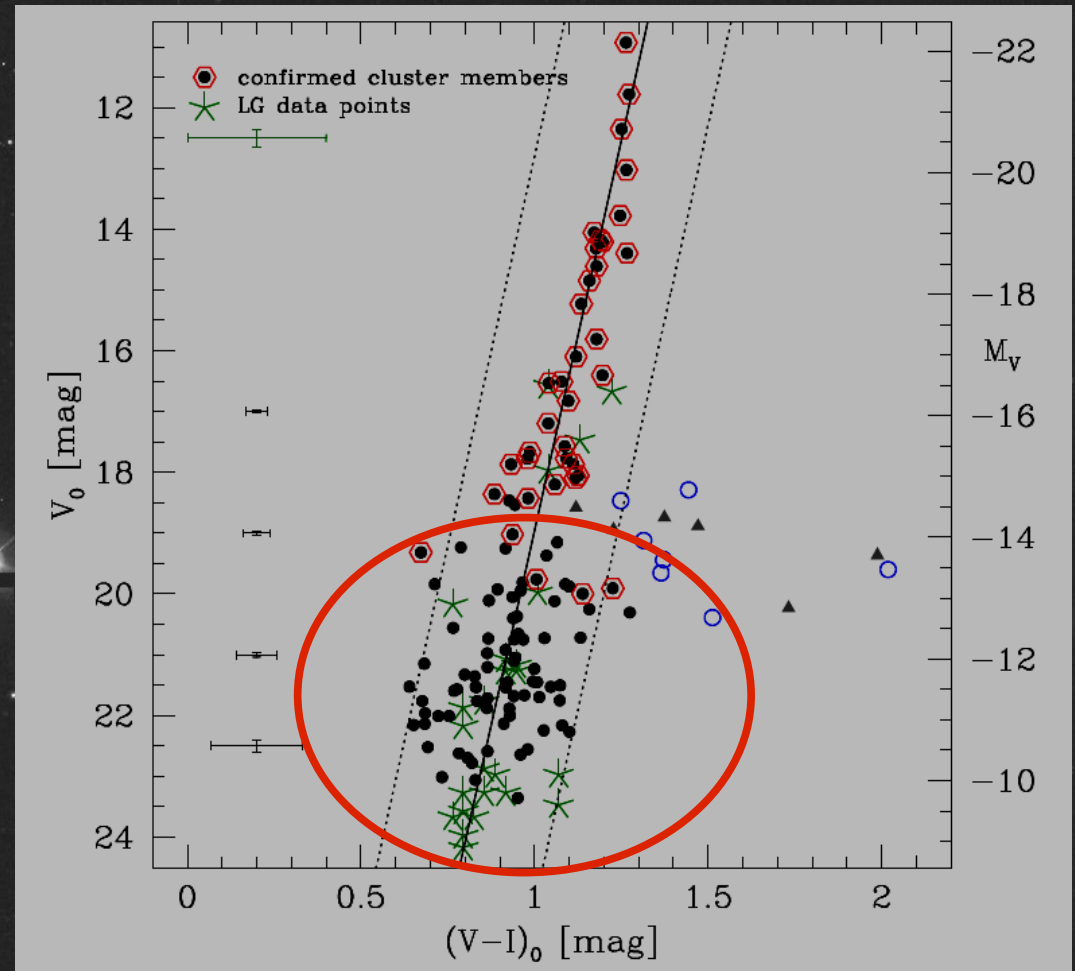


Hydra I: Misgeld et al. (2008)

# Galaxy clusters show a linear early type CMR



Virgo: Sabatini et al. (2005)

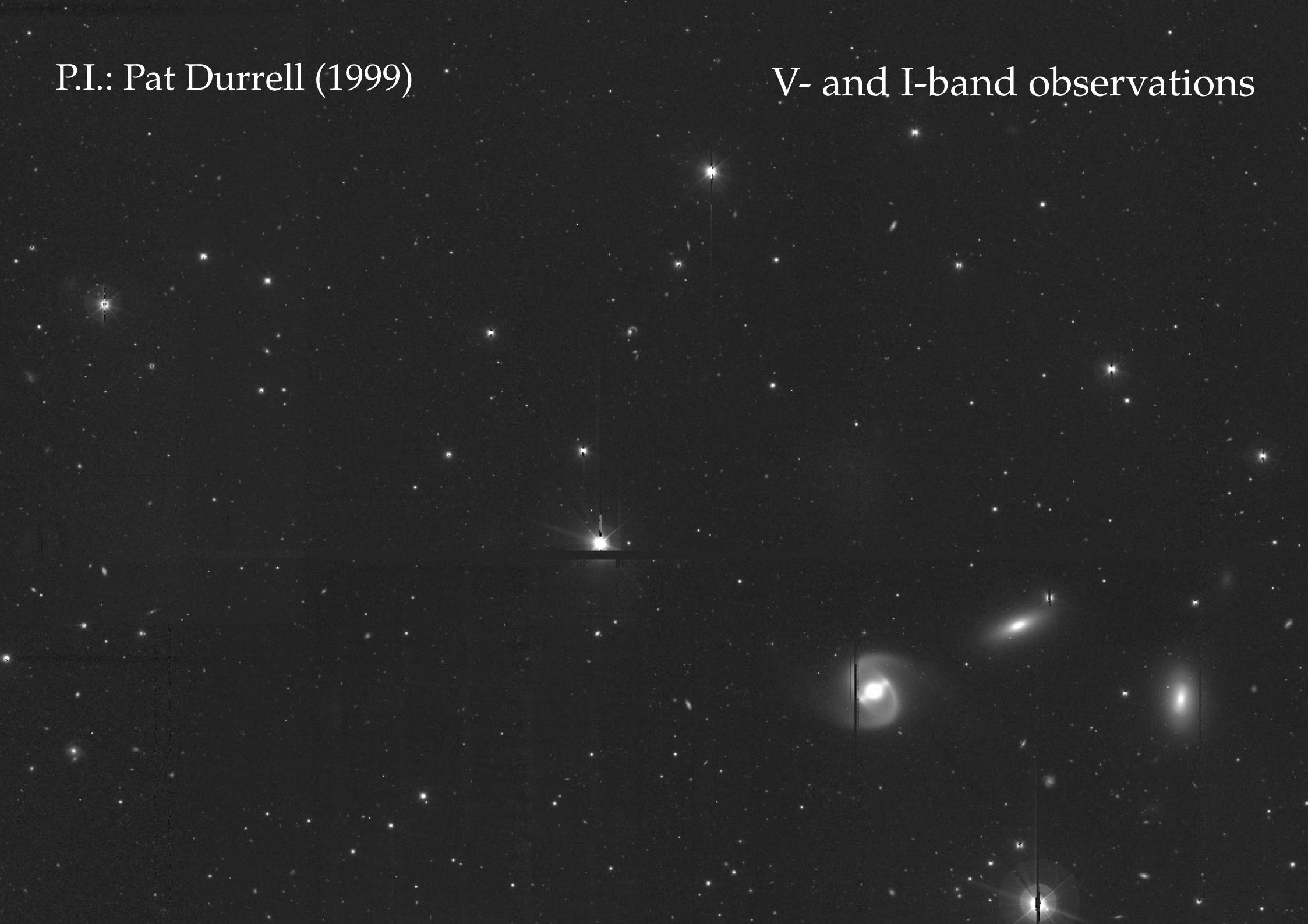


Hydra I: Misgeld et al. (2008)

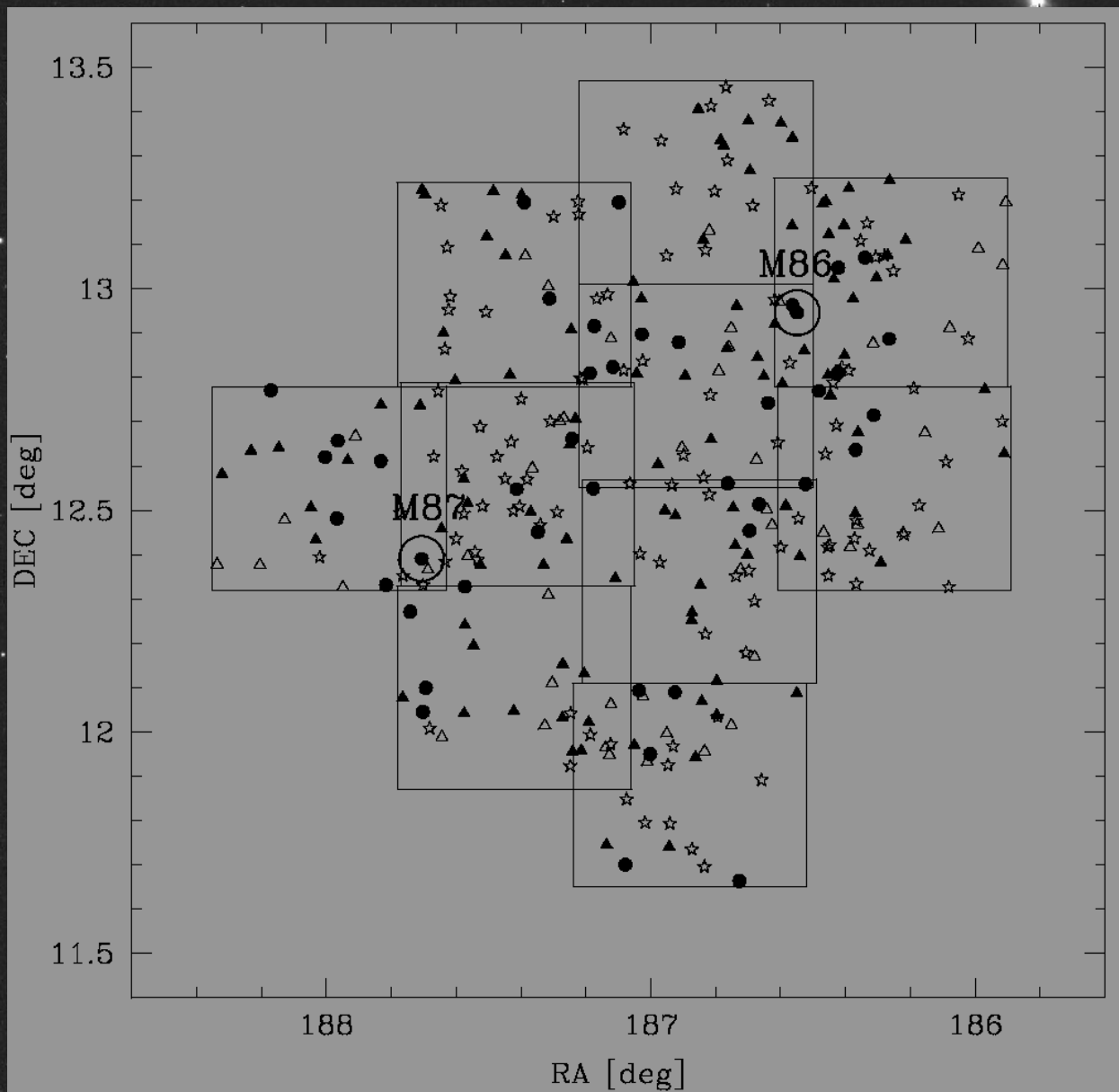


P.I.: Pat Durrell (1999)

V- and I-band observations



# Virgo cluster core (0.4 Mpc<sup>2</sup>)



Exp.time: 30-50 min

Depth:

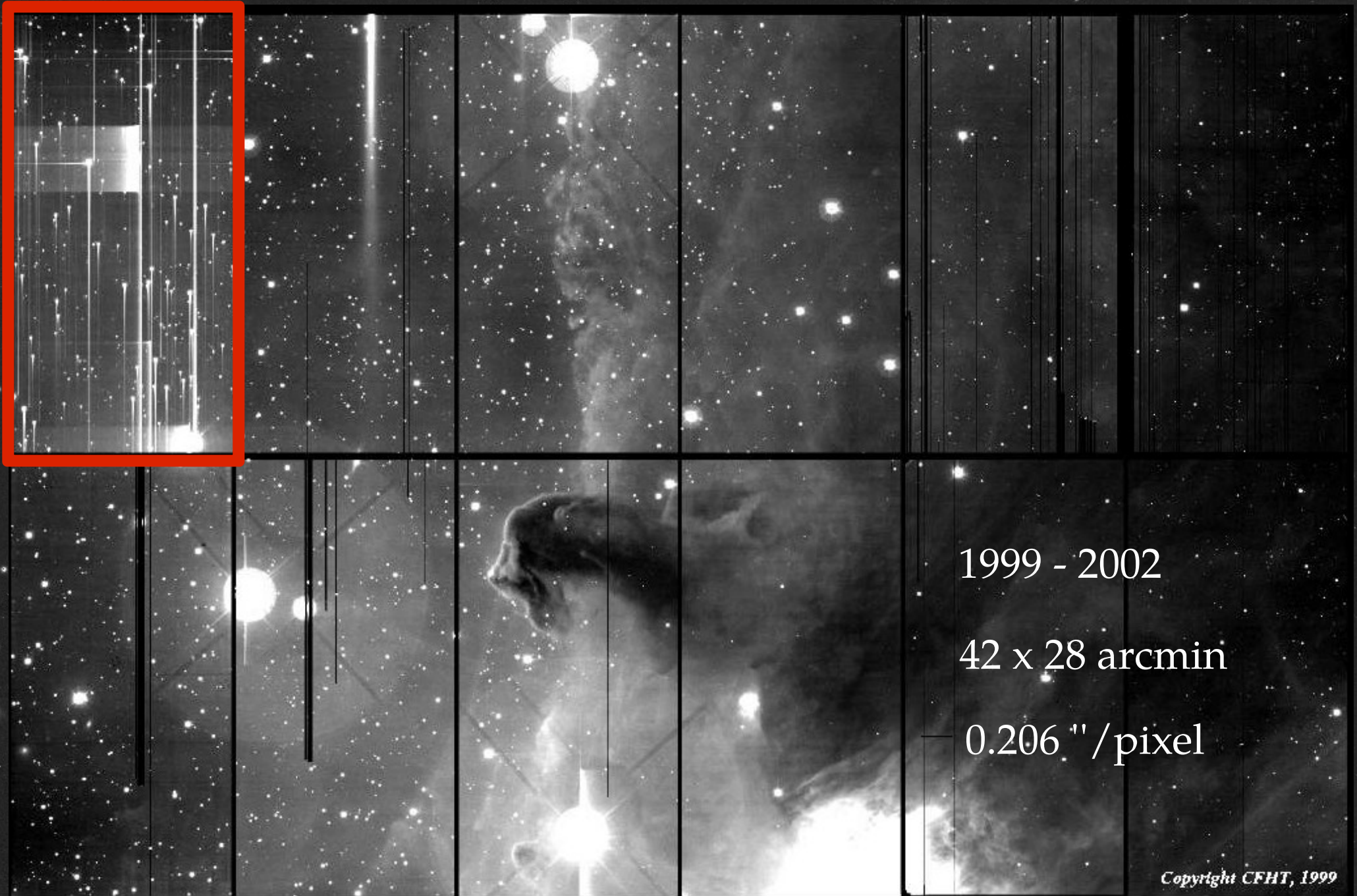
$\mu_V = 26.5 \text{ mag/arcsec}^2$

$\mu_I = 25.2 \text{ mag/arcsec}^2$

(1 $\sigma$  per 0.2" pixel)

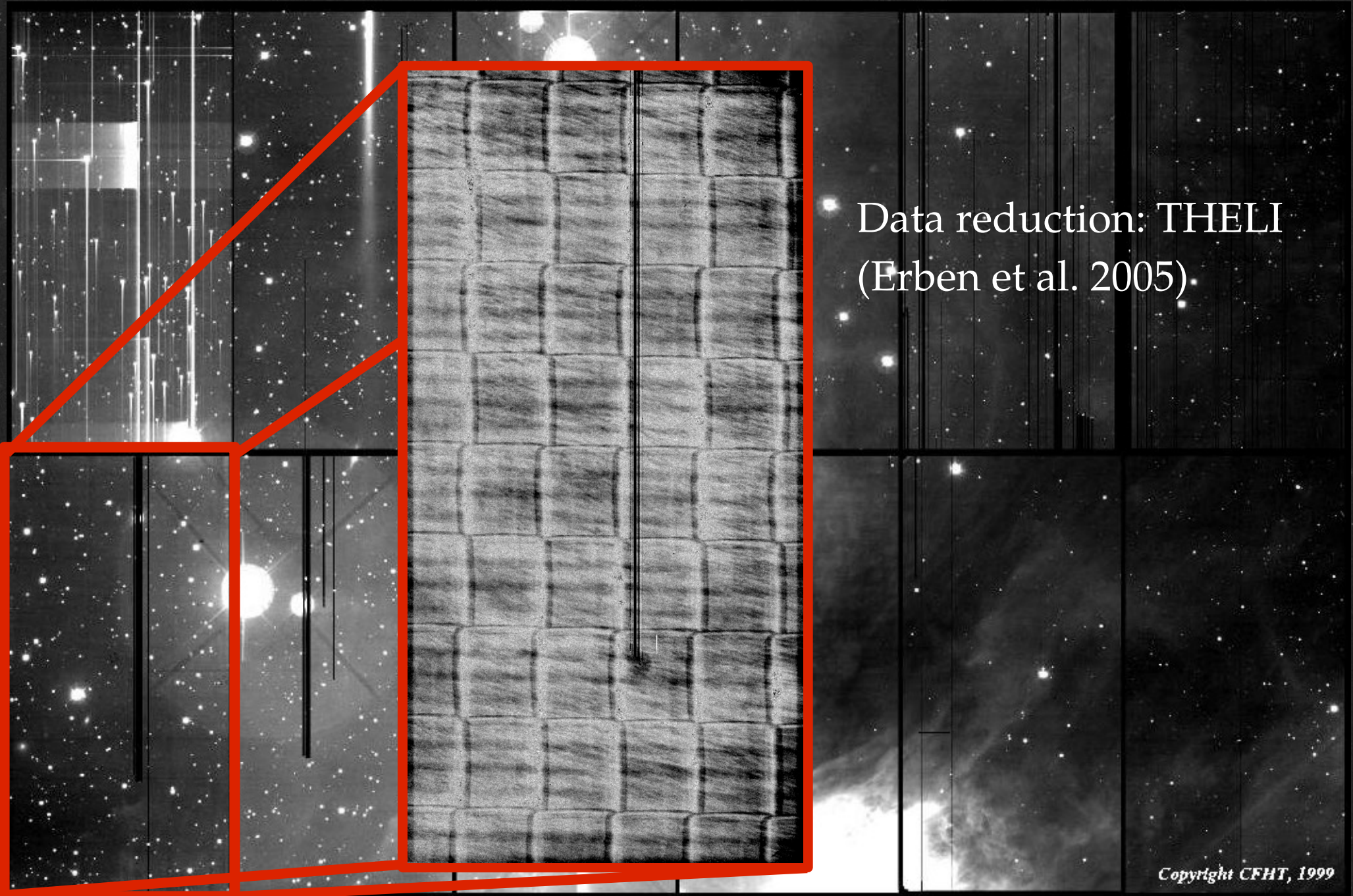


# *CFH12k@CFHT issues*





# *CFH12k@CFHT issues*



Data reduction: THELI  
(Erben et al. 2005)

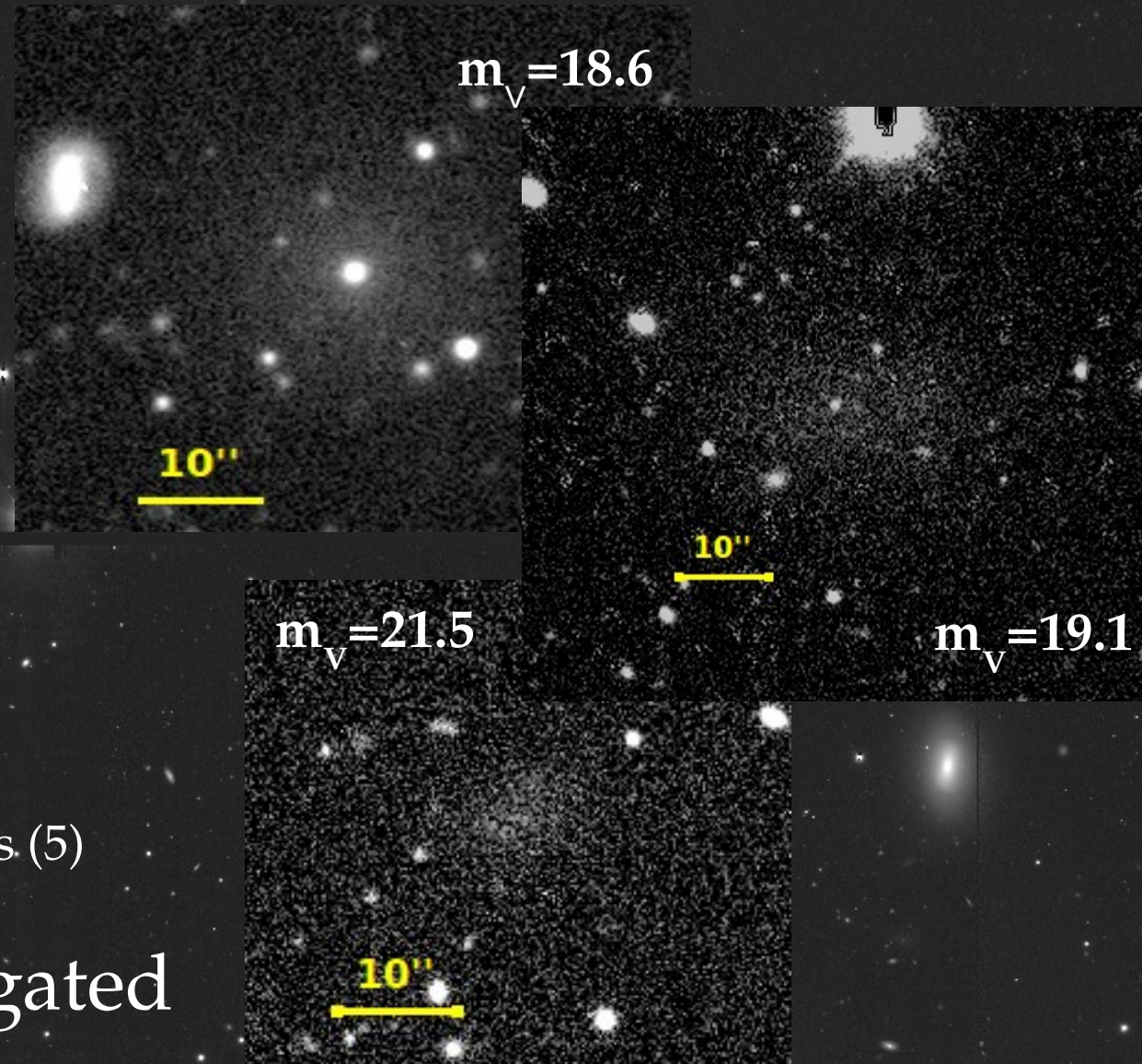


# *visual selection in both bands independently*

## 371 galaxies preselected (mainly early-type)

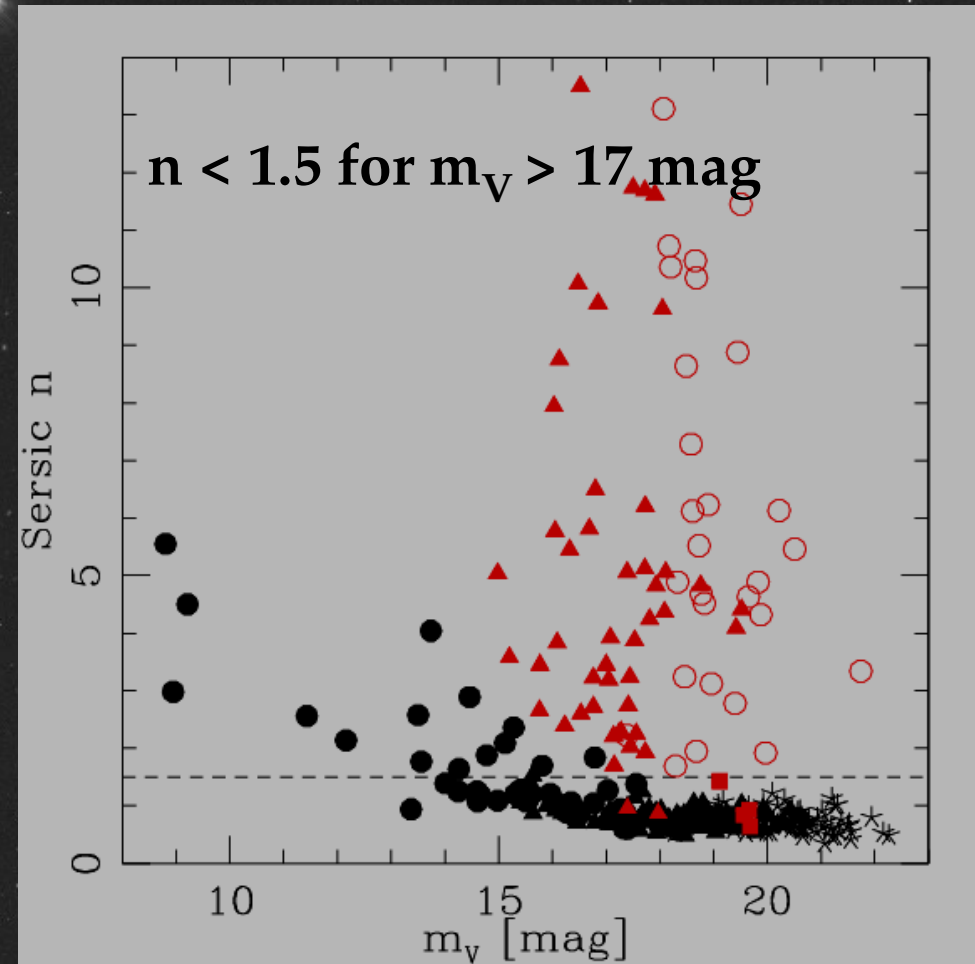
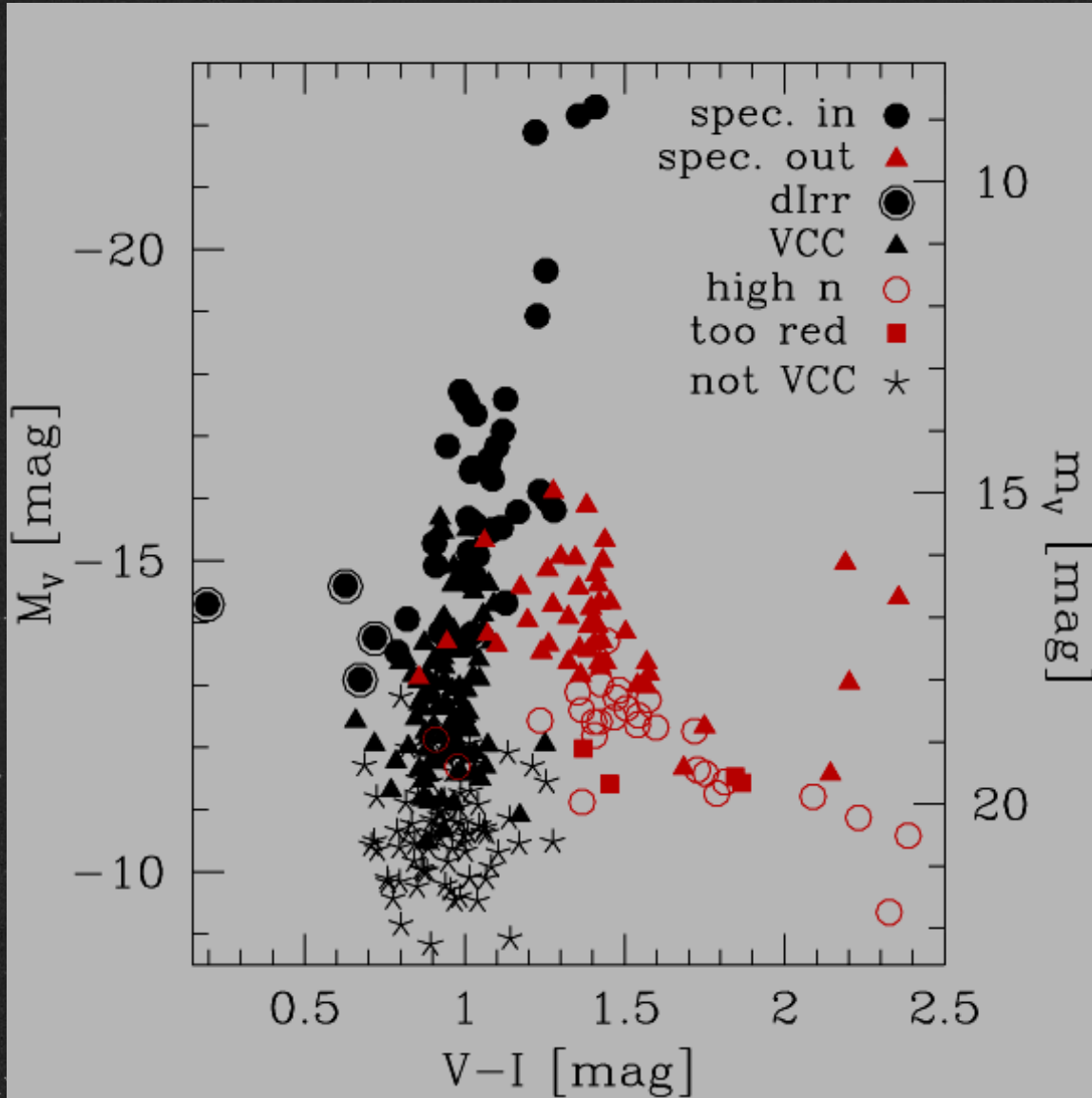
- diffraction spike (2 rejected)
- foreground star's halo (5)
- merger signature (5)
- 'spiral' structure (27)
- 'dust' feature (11)
- matching object in both bands (5)
- center not imaged (3)
- unrobust fits (3)
- too small (9)
- small scale brightness fluctuations (5)

→ 296 galaxies investigated





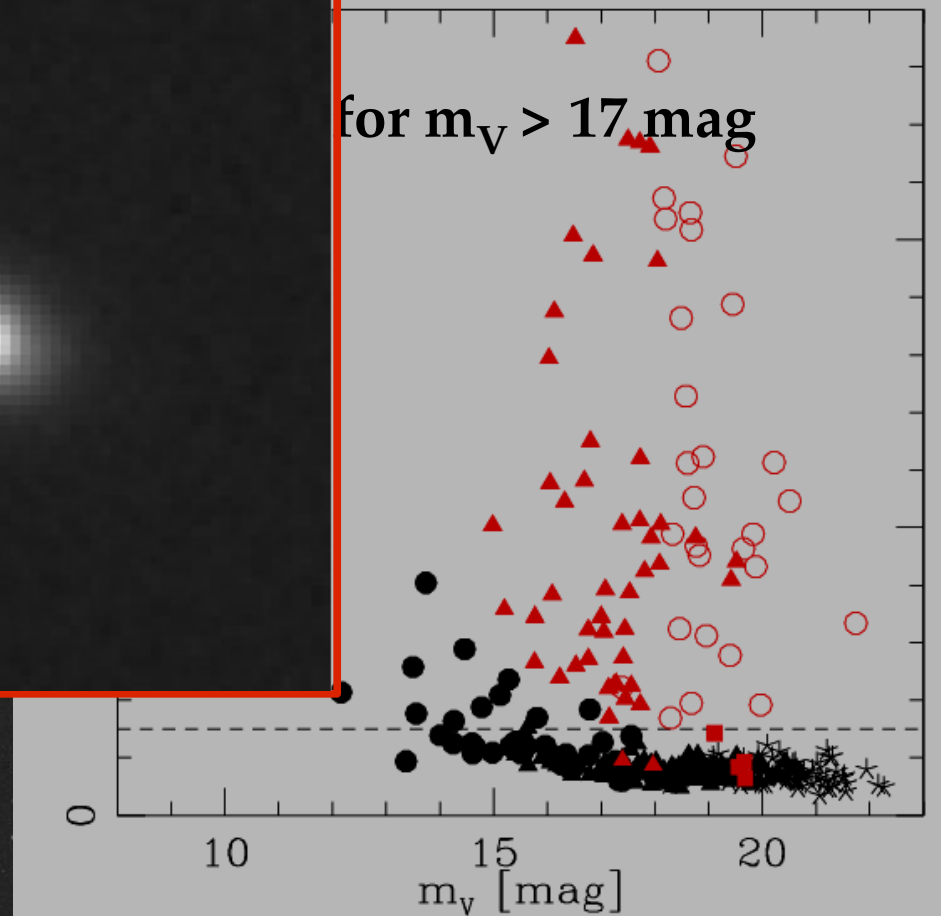
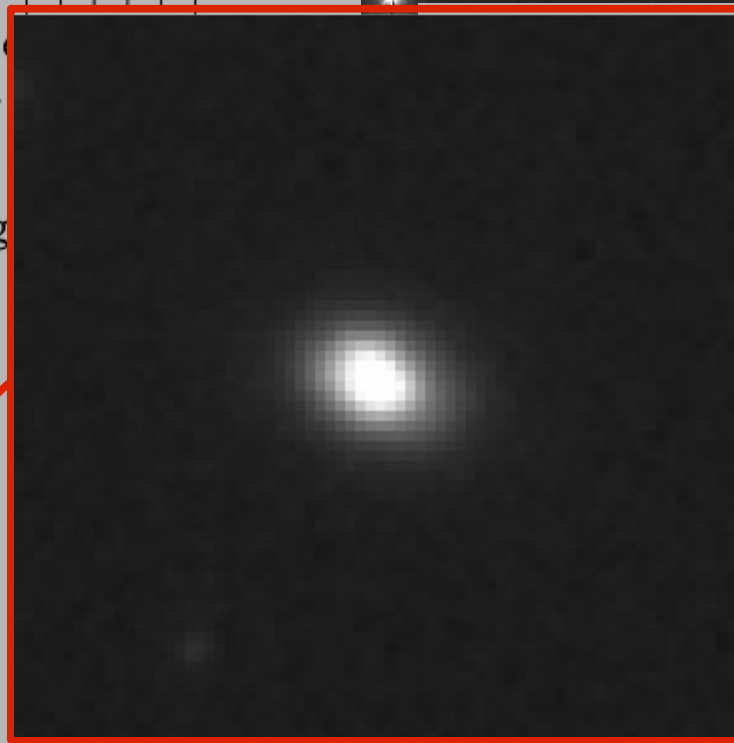
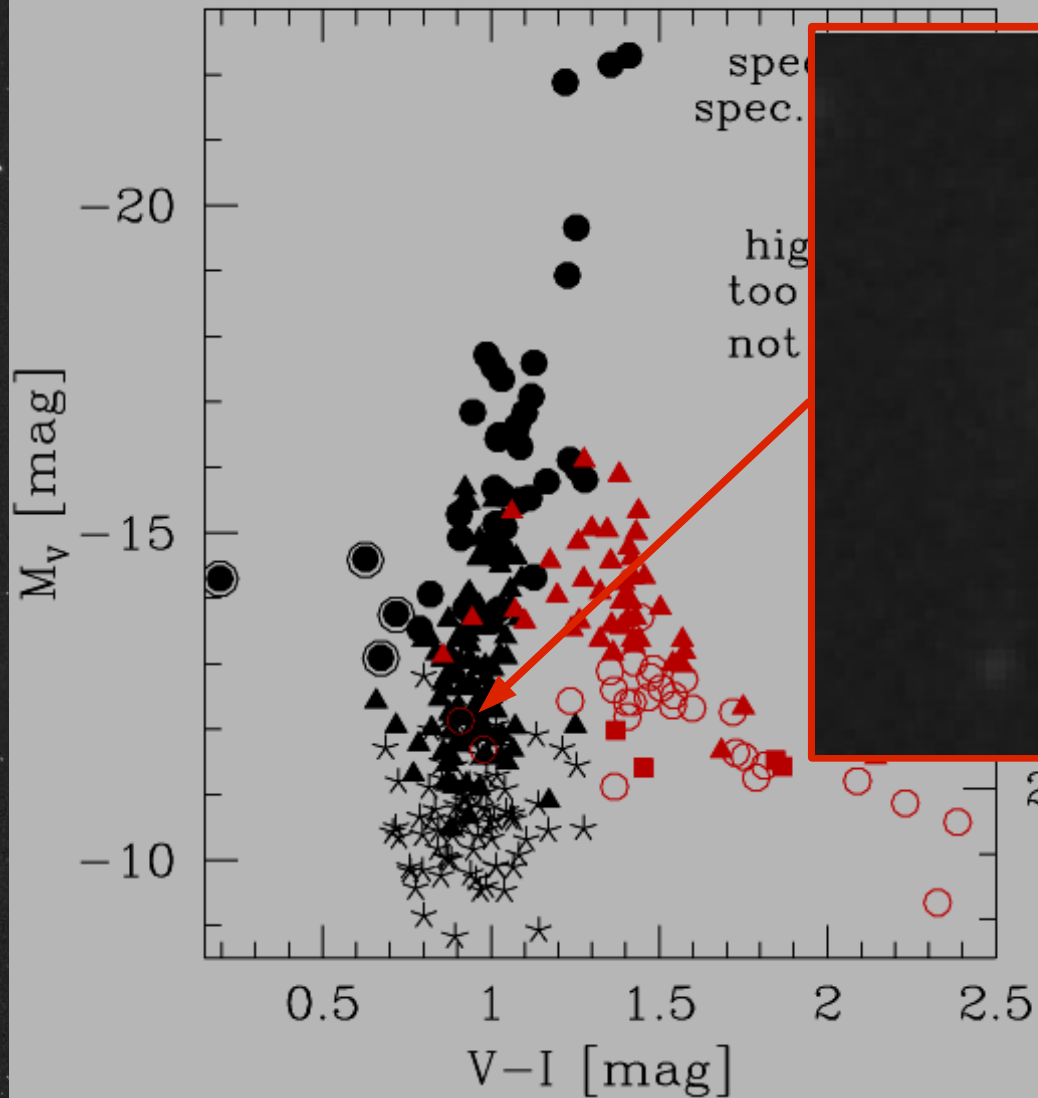
# Virgo galaxies well separated from background galaxies



$m-M = 31.09$  mag (Mei et al. 2007)

$-900$  km/s  $< v < 2700$  km/s (Binggeli et al. 1993)

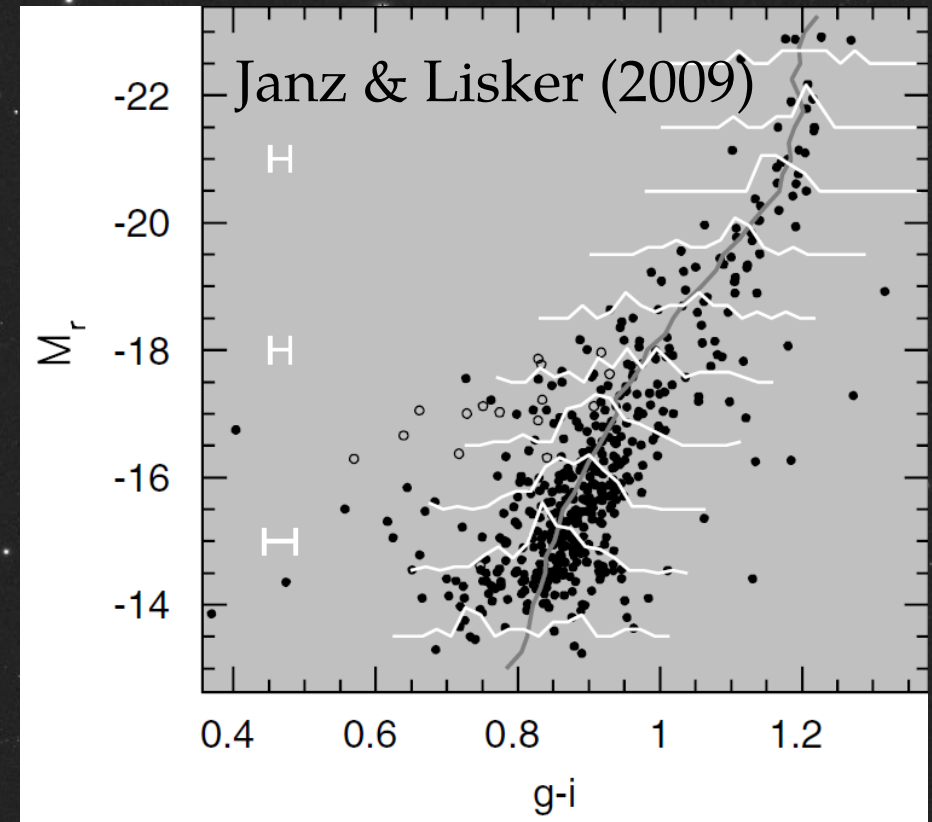
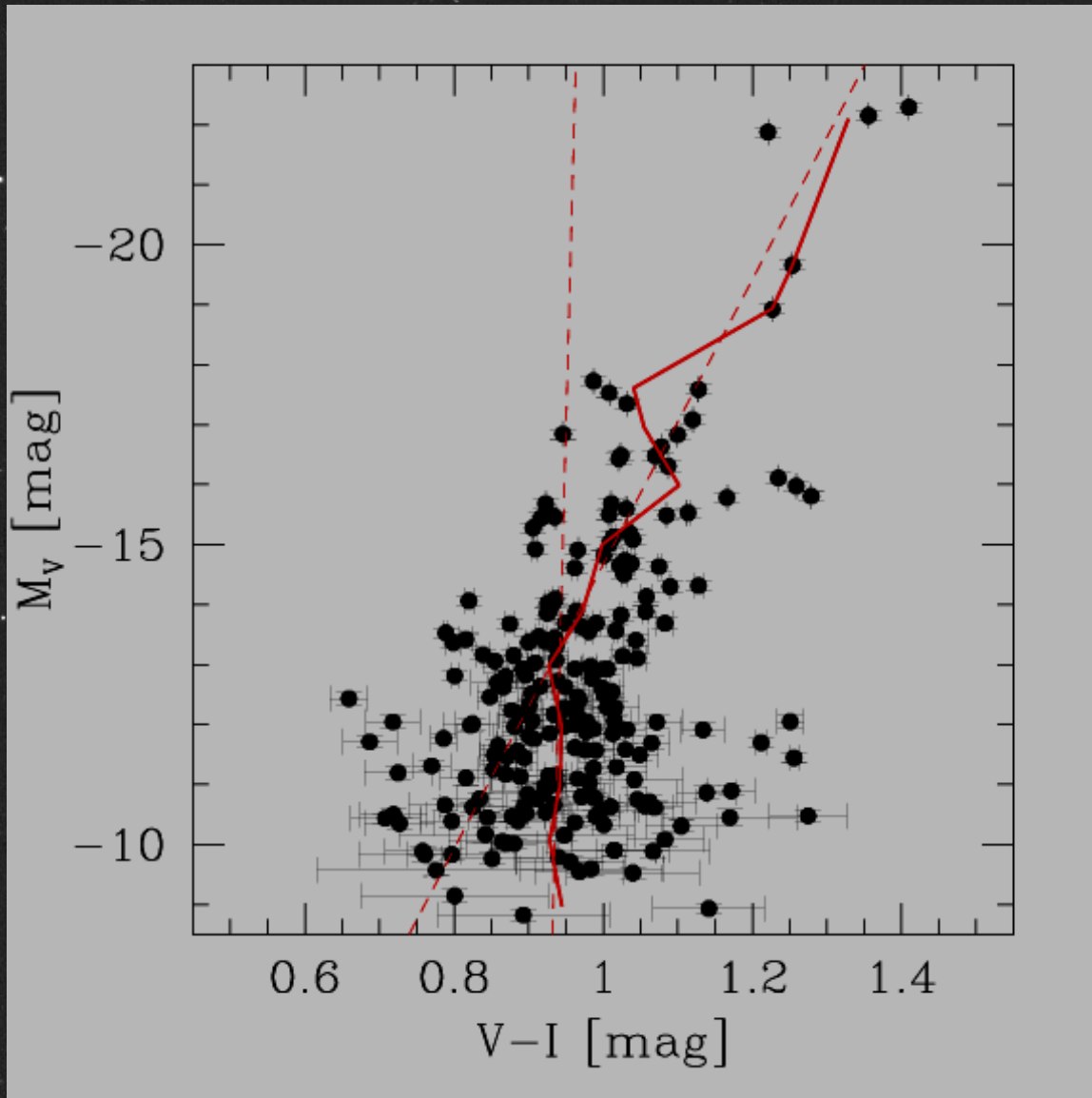
# *SFB criterion rejects possible cE*



*213 early type galaxies – 65 uncatalogued*

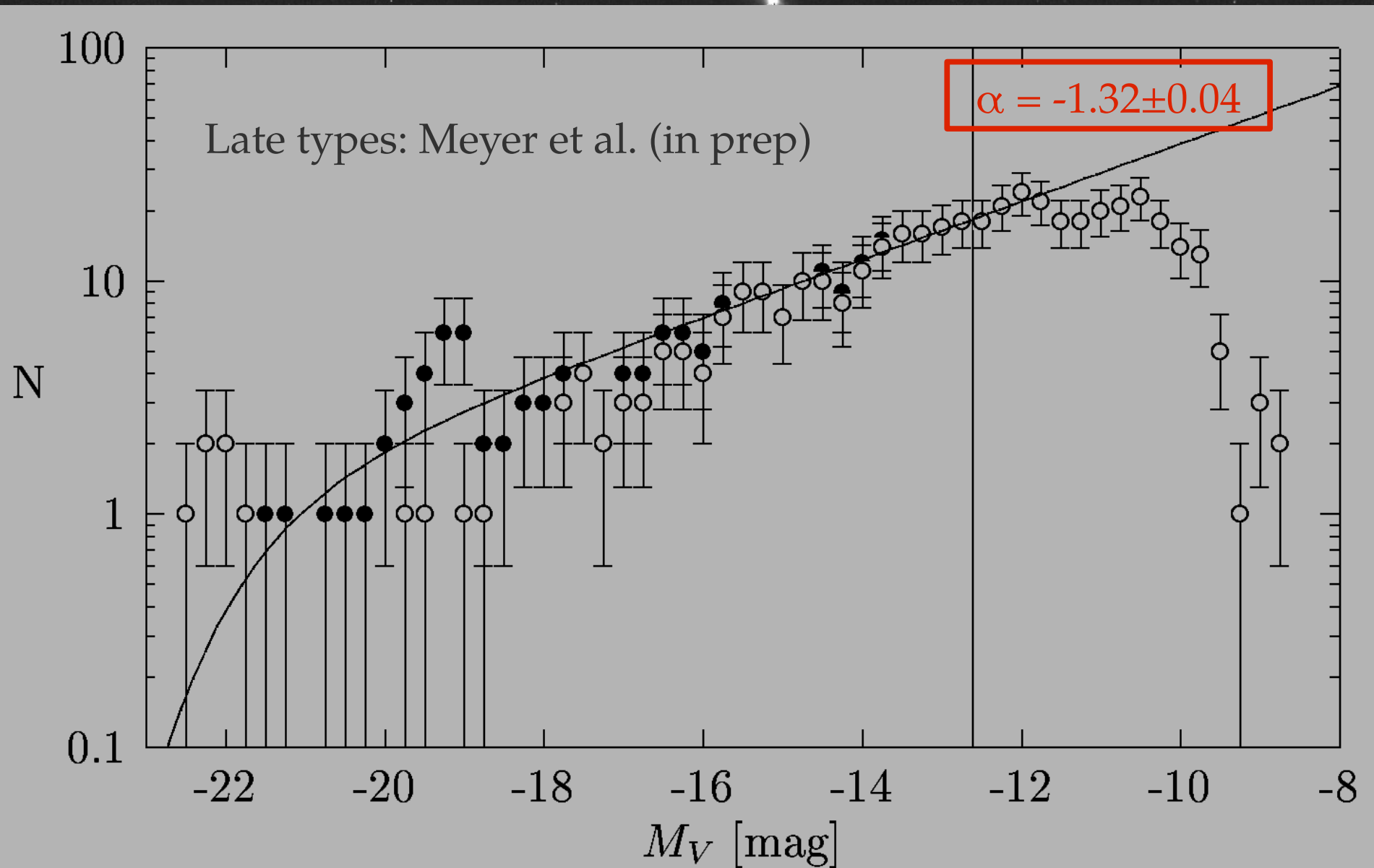


# *Early type CMR shows different trend for dSphs*



see also Ferrarese et al. (2006)  
and Laura's talk yesterday

# *Luminosity function as 'expected'*





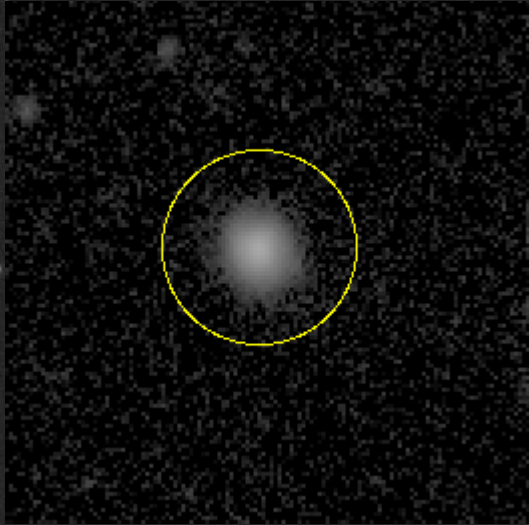
# Summary

- 65 new Virgo dSphs (77 VCC uncatalogued)
- CMR shows change in slope for dSph regime
- LF faint end slope  $\alpha = -1.32$

Submitted to A&A: S. Lieder et al. „A deep view on the Virgo cluster core“

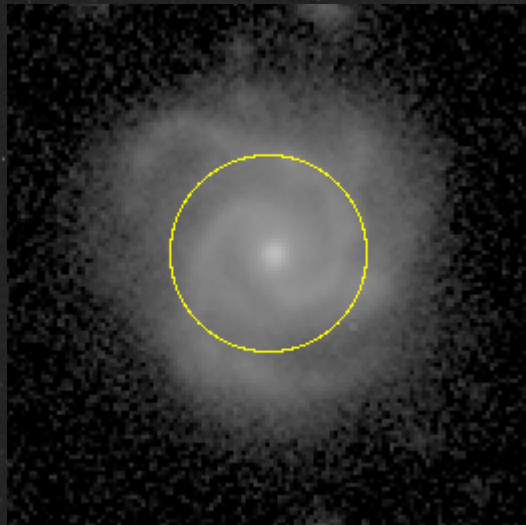
# *Selection criteria*

## Preselection



- Diameter larger  $\sim 10$  arcsecs (Binggeli et al. 1985)
- No obvious spirals
- dIrrs with tolerable elliptical shape

→ 371 galaxies selected



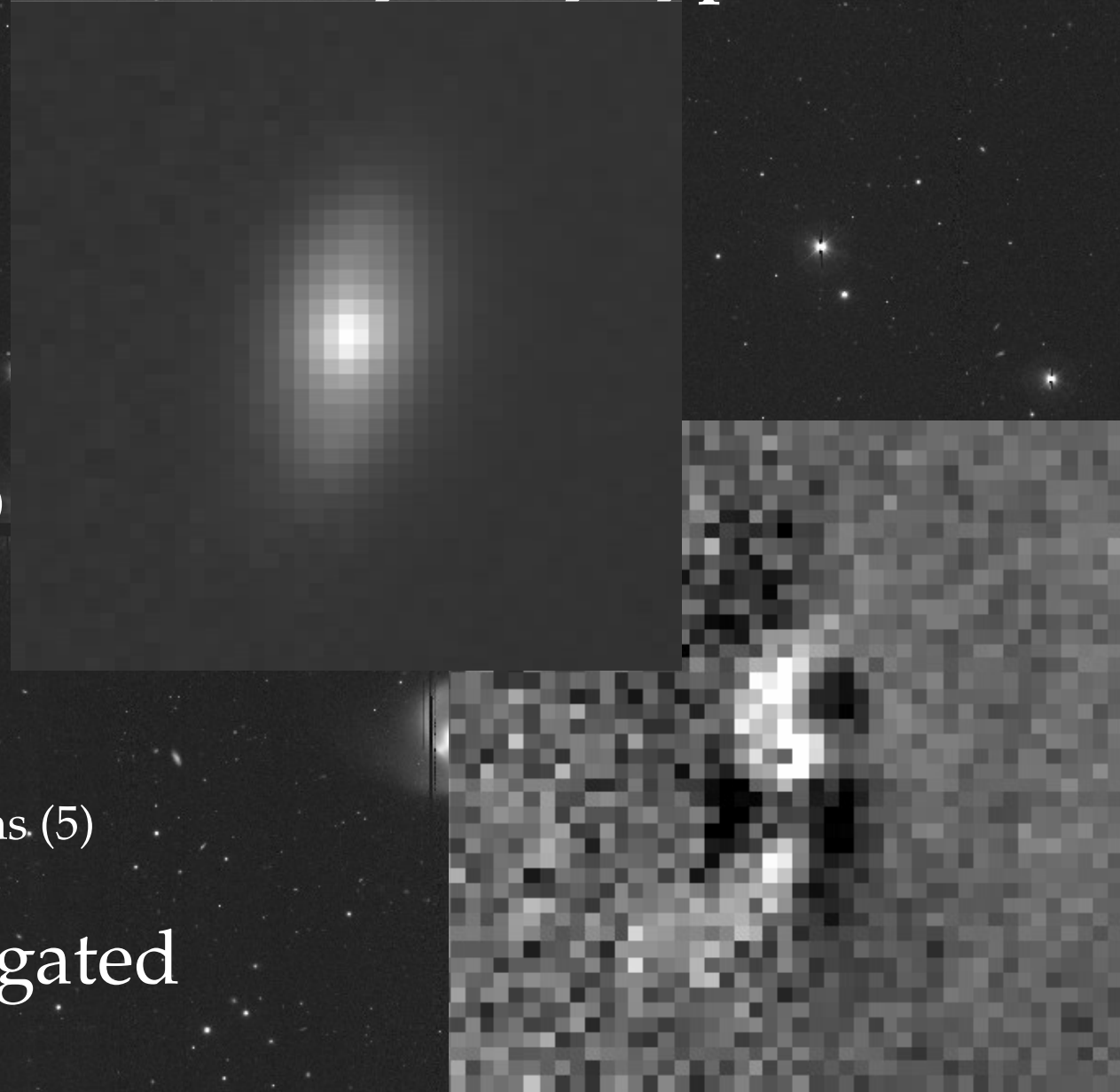


# *Bye eye selection in both bands independently*

## 371 galaxies preselected (mainly early-type)

- diffraction spike (2 rejected)
- foreground star's halo (5)
- merger signature (5)
- 'spiral' structure (27)
- 'dust' feature (11)
- matching object in both bands (5)
- center not imaged (3)
- unrobust fits (3)
- too small (9)
- small scale brightness fluctuations (5)

→ 296 galaxies investigated

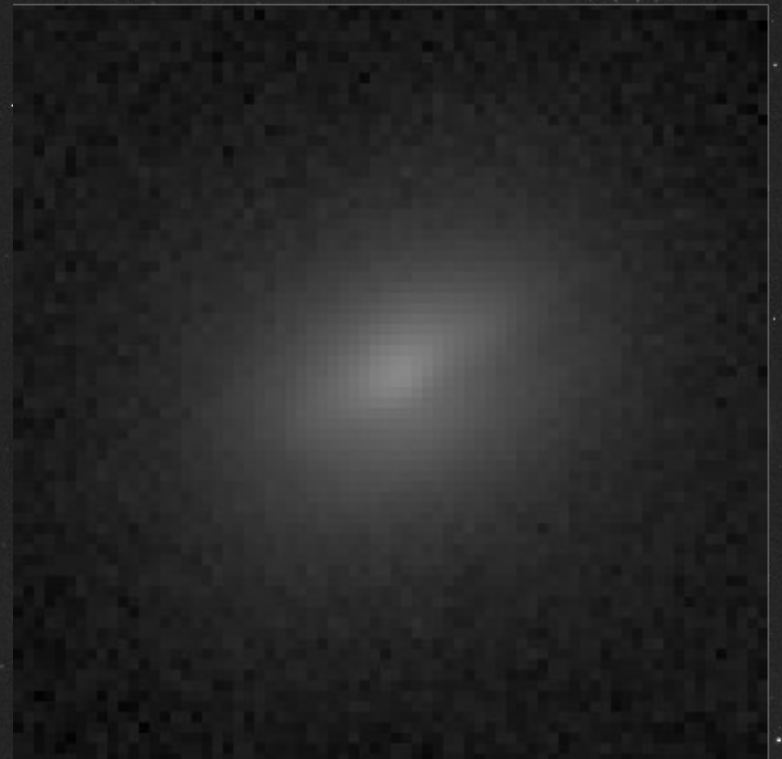


# *Bye eye selection in both bands independently*

## 371 galaxies preselected (mainly early-type)

- diffraction spike (2 rejected)
- foreground star's halo (5)
- merger signature (5)
- 'spiral' structure (27)
- 'dust' feature (11)
- matching object in both bands (5)
- center not imaged (3)
- unrobust fits (3)
- too small (9)
- small scale brightness fluctuations (5)

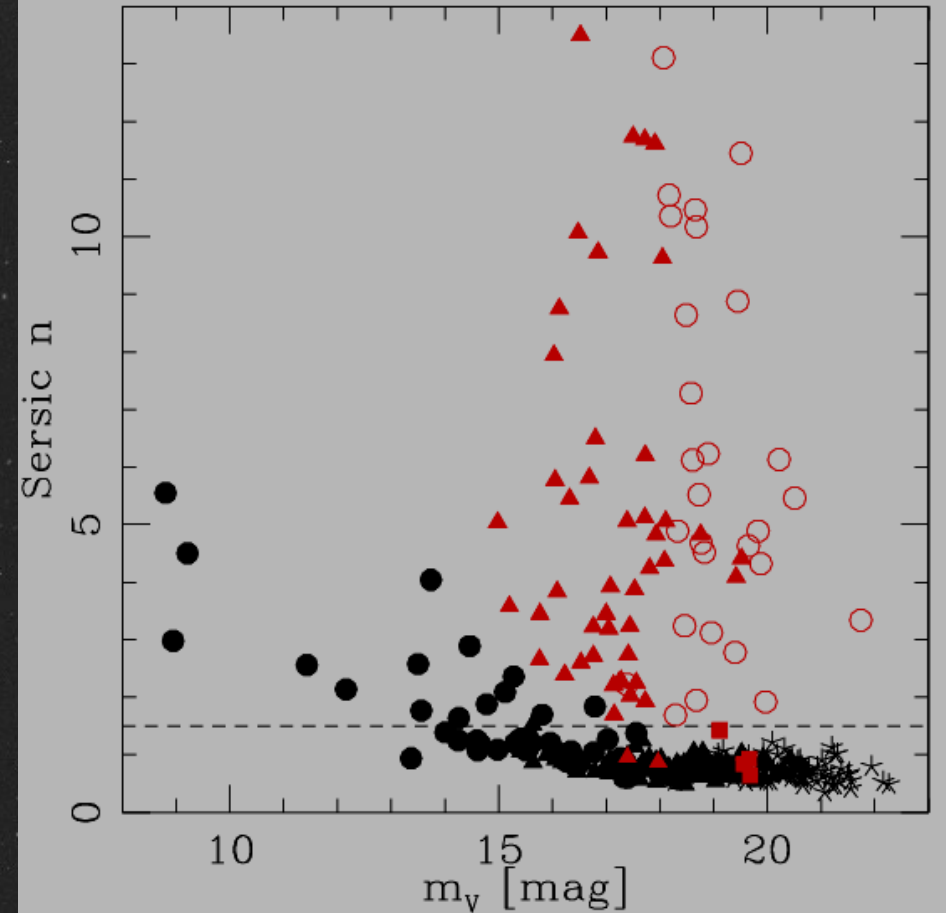
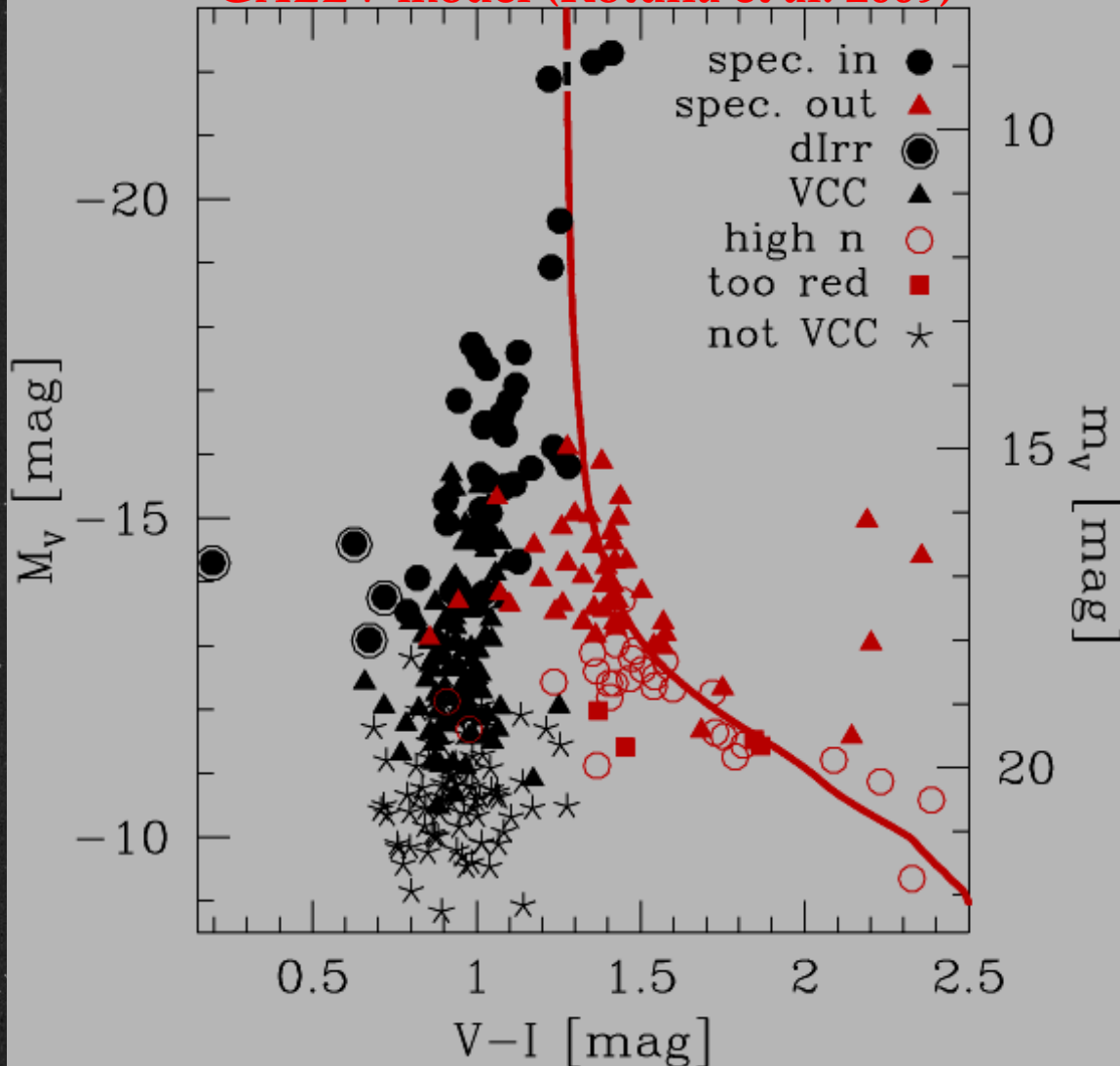
→ 296 galaxies investigated



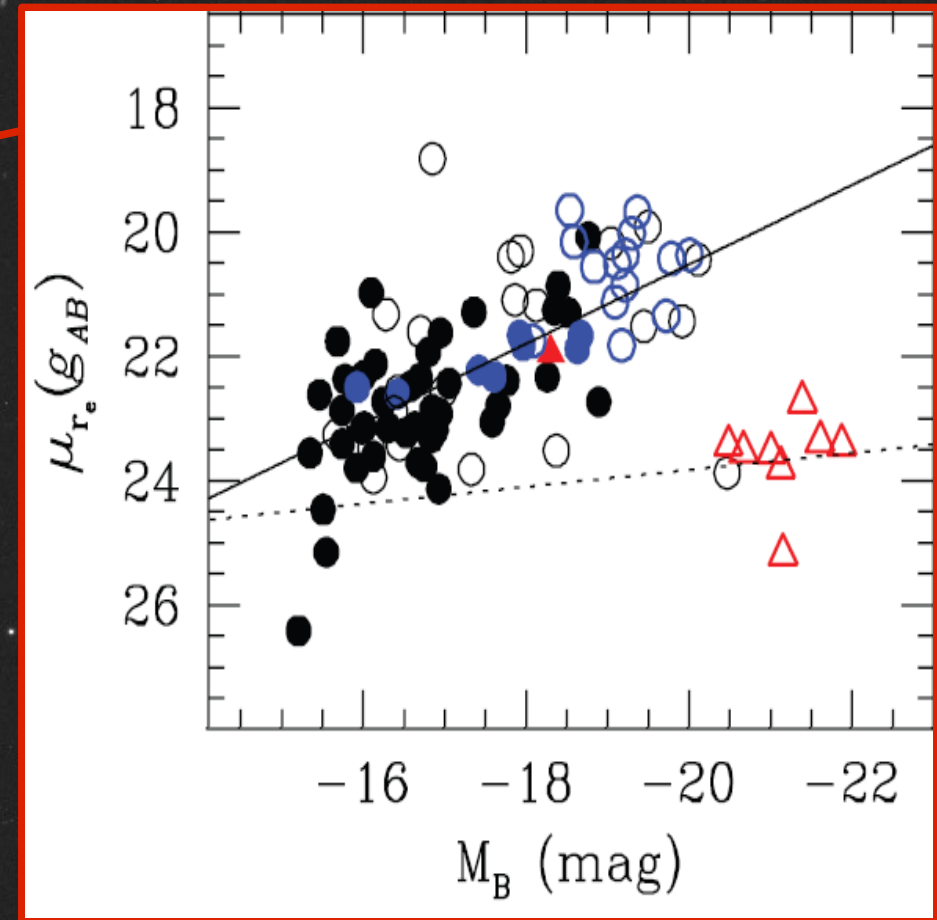
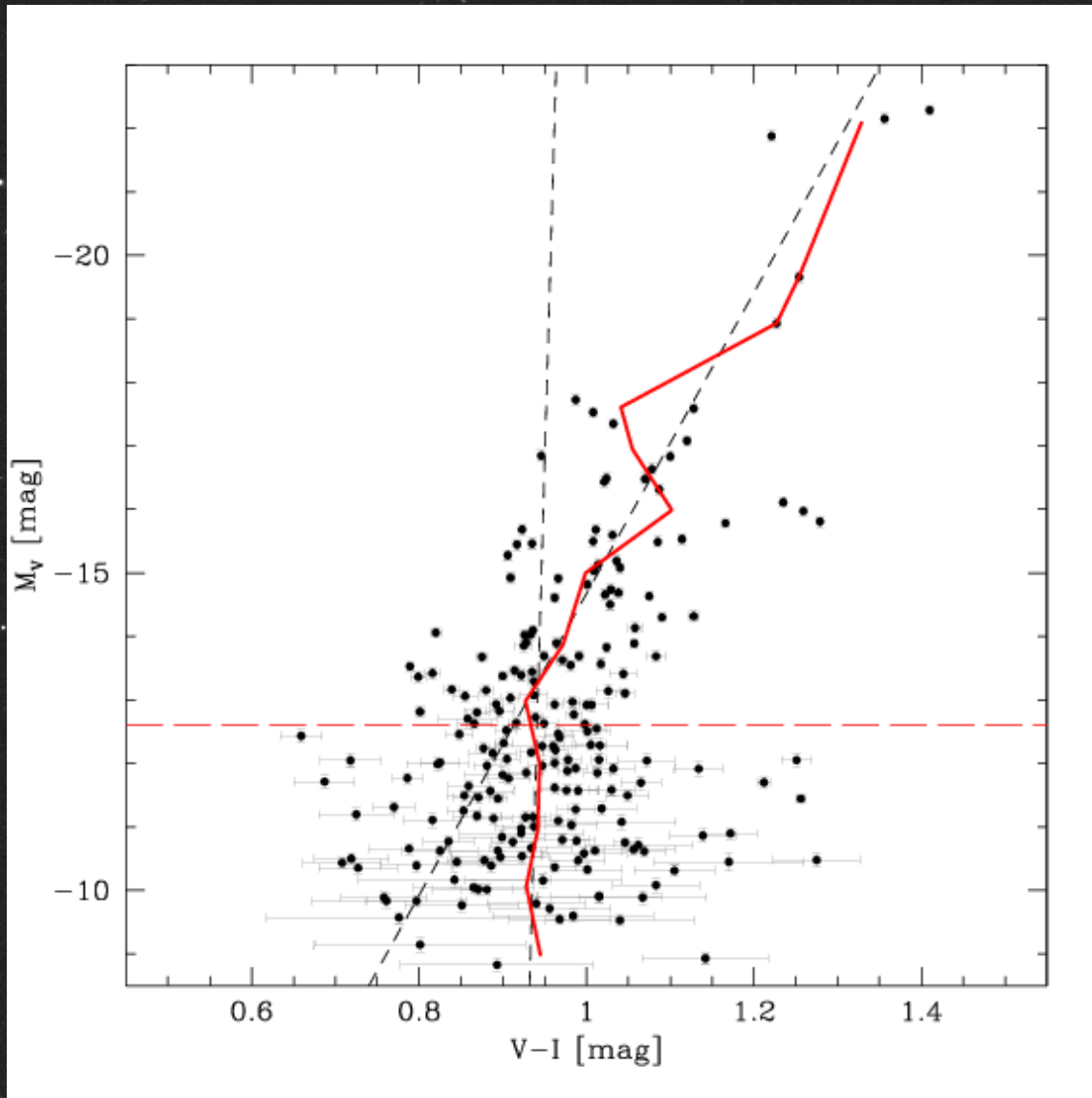


# 213 early type galaxies – 65 uncatalogued

GALEV model (Kotulla et al. 2009)



# Completeness



Forson et al. (2006)



# *LF faint end slope uncertainty*

