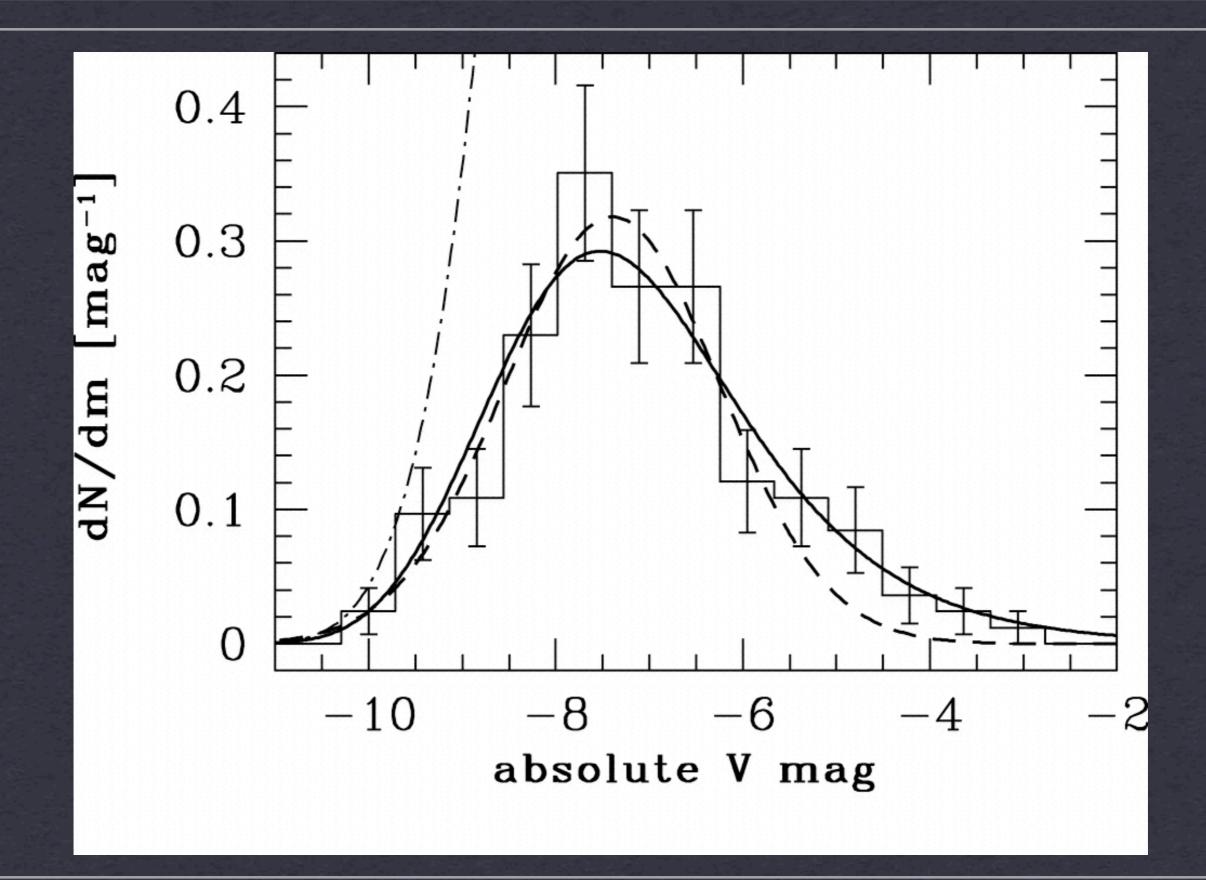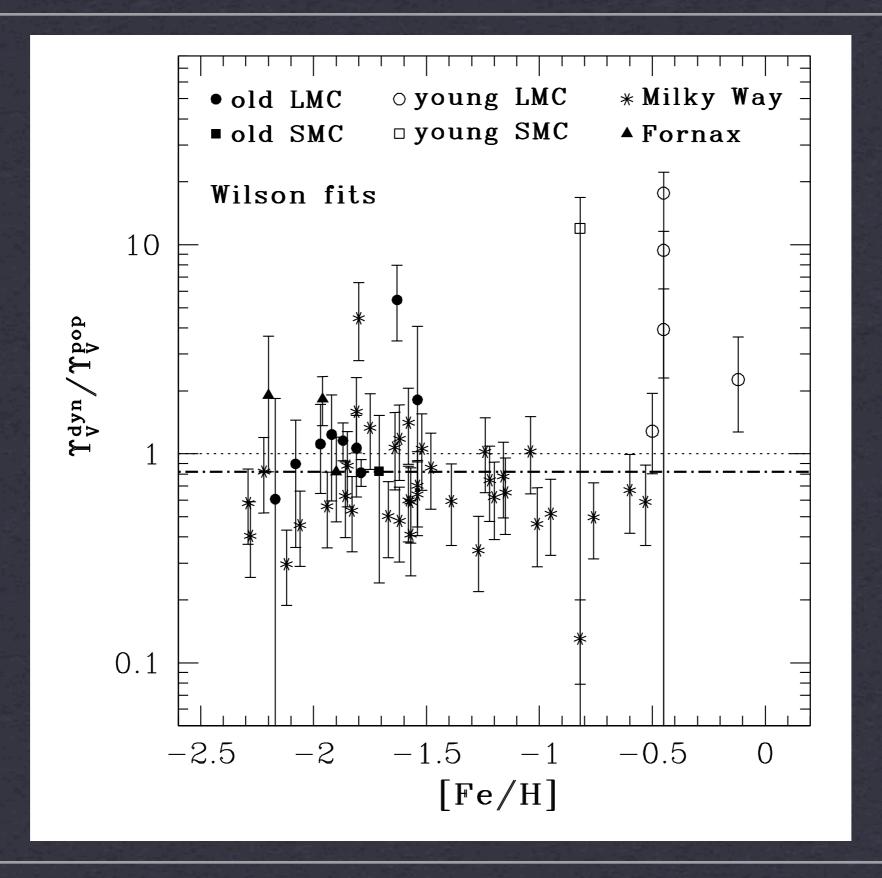# The observed mass function of GCs

Andrés Jordán
Dept. of Astronomy & Astrophysics, PUC, Chile
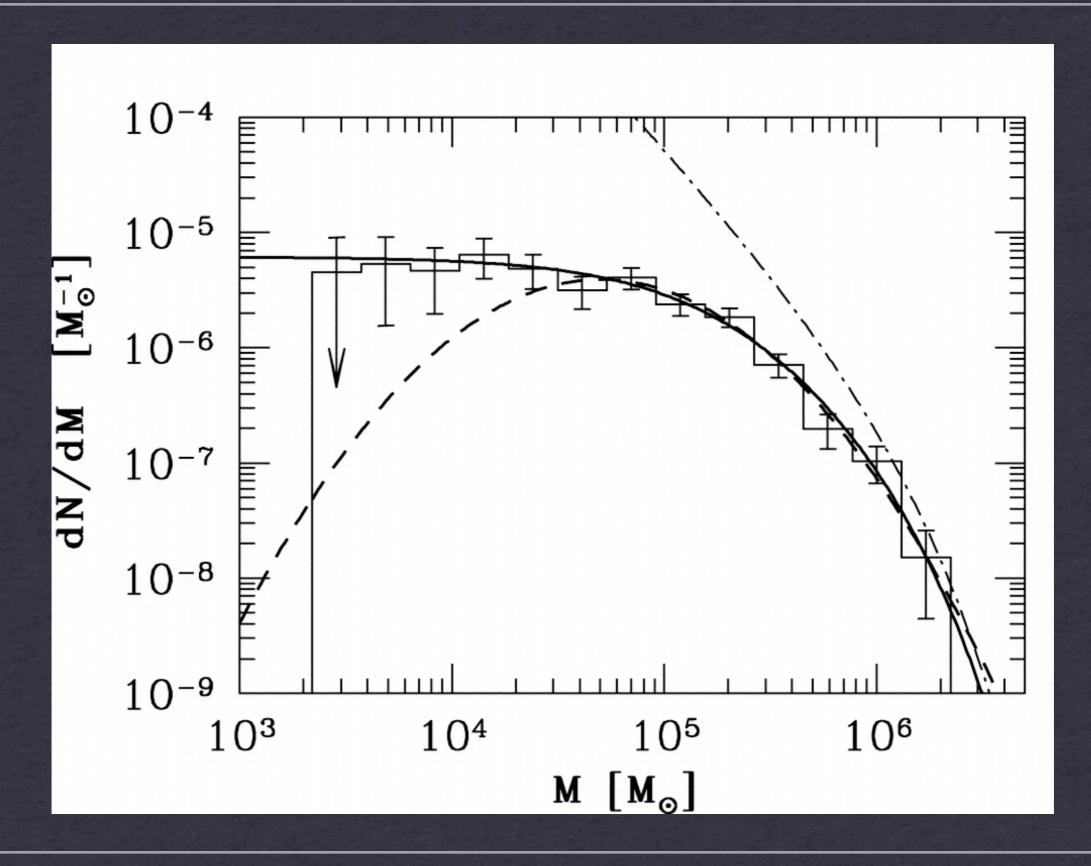
THE GCLF OF THE MILKY WAY

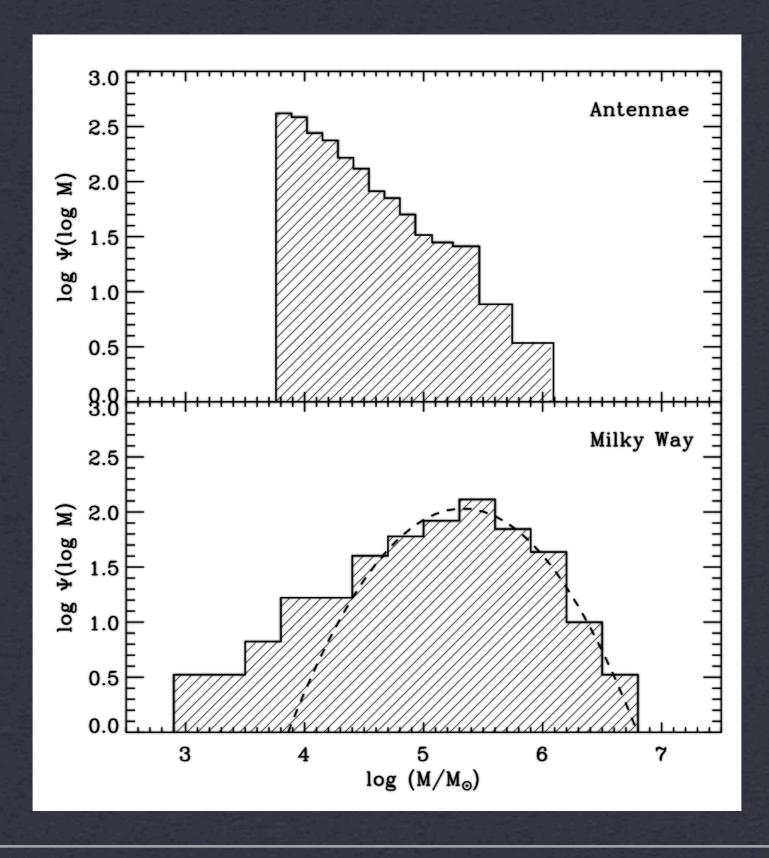FIGURE FROM JORDÁN ET AL 2007.

DYNAMICAL VS POPULATION SYNTHESIS (M/L).
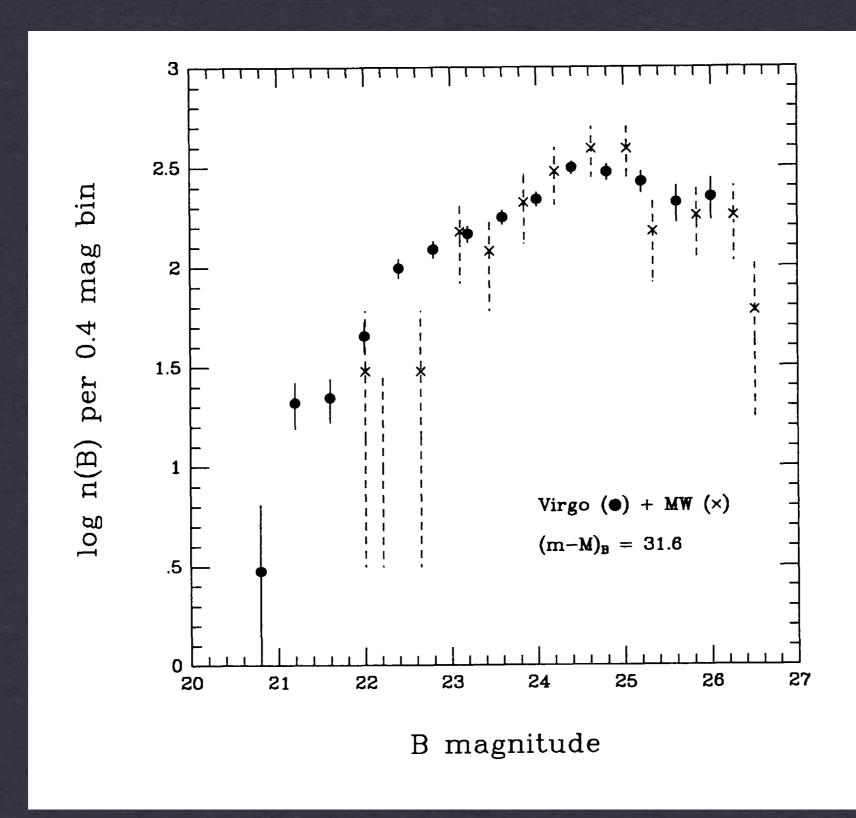
MCLAUGHLIN & VAN DER MAREL 2005.
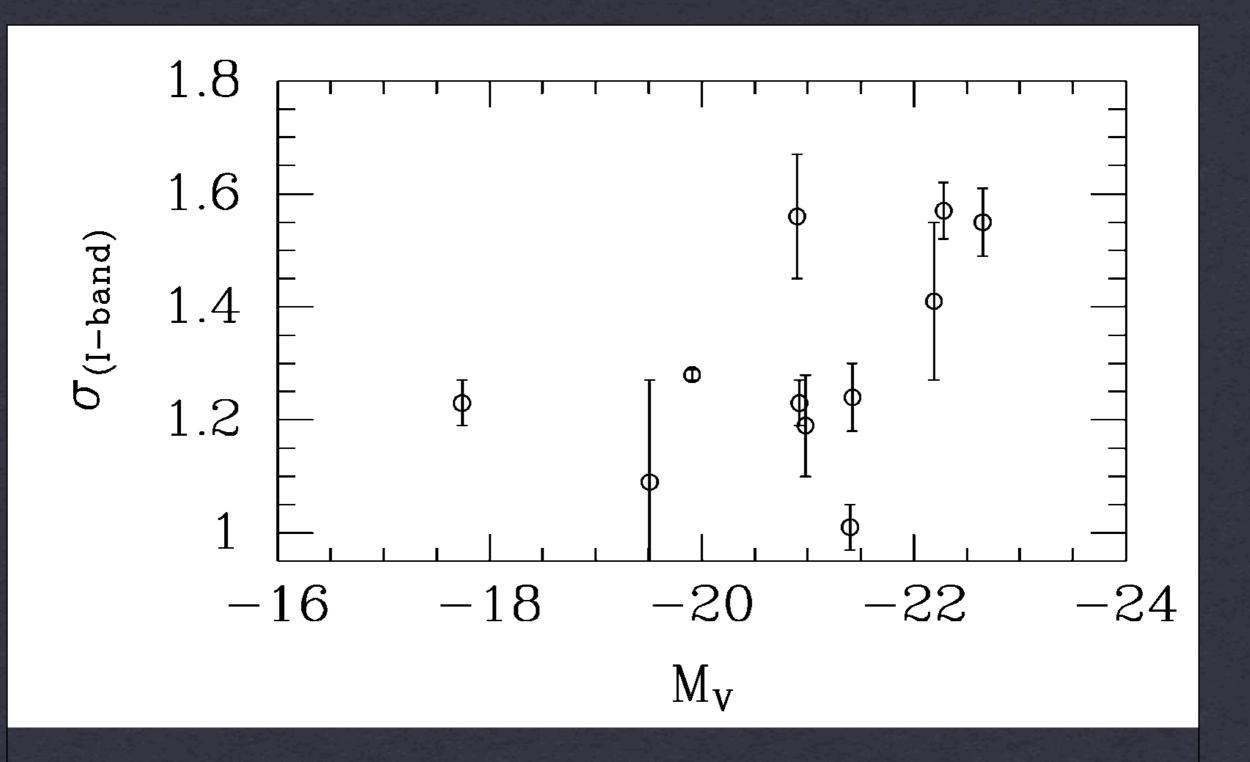
FROM POWER-LAW (OR SCHECHTER) TO BELL SHAPE
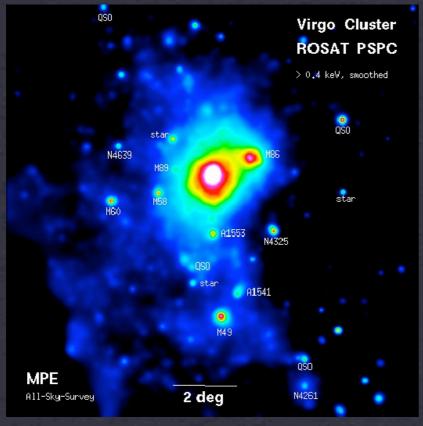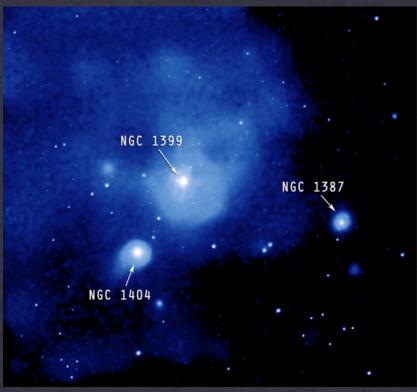
The ACS Virgo and Fornax Cluster Surveys.
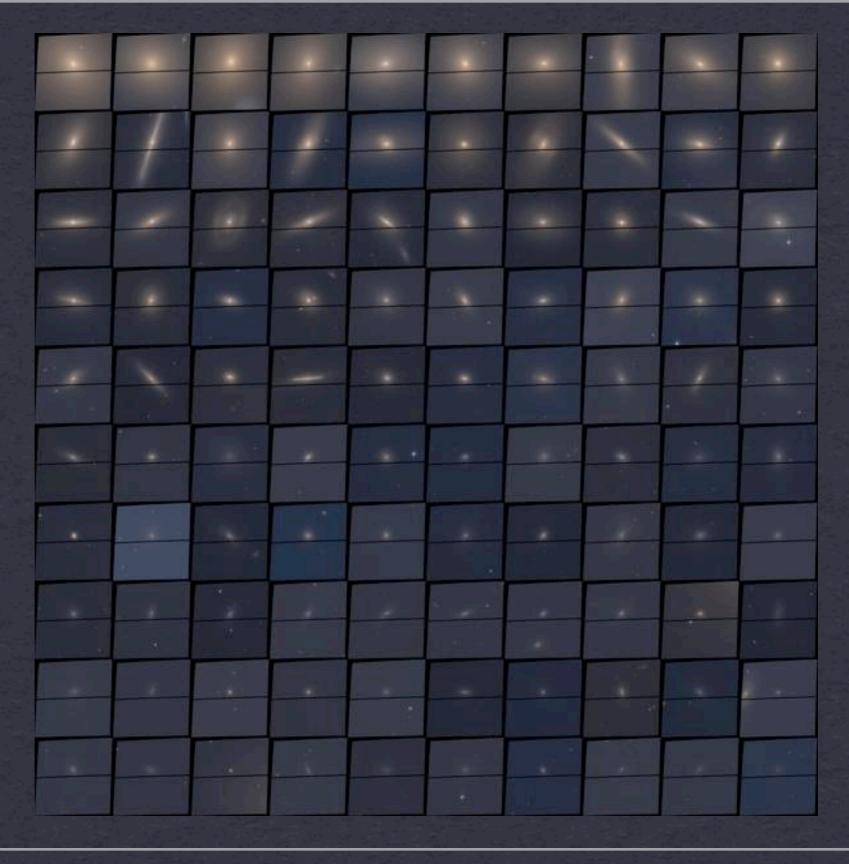
THE ACS VIRGO & FORNAX CLUSTER SURVEYS.
CÔTÉ ET AL 2004, JORDÁN ET AL 2007.

THE ACS VIRGO & FORNAX CLUSTER SURVEYS.
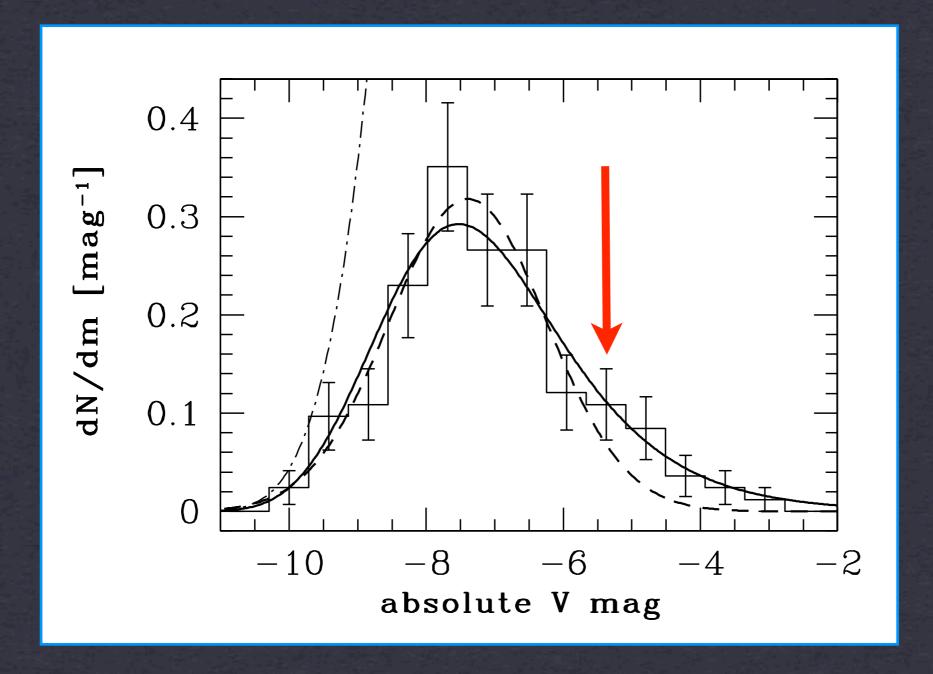
CÔTÉ ET AL 2004, JORDÁN ET AL 2007.
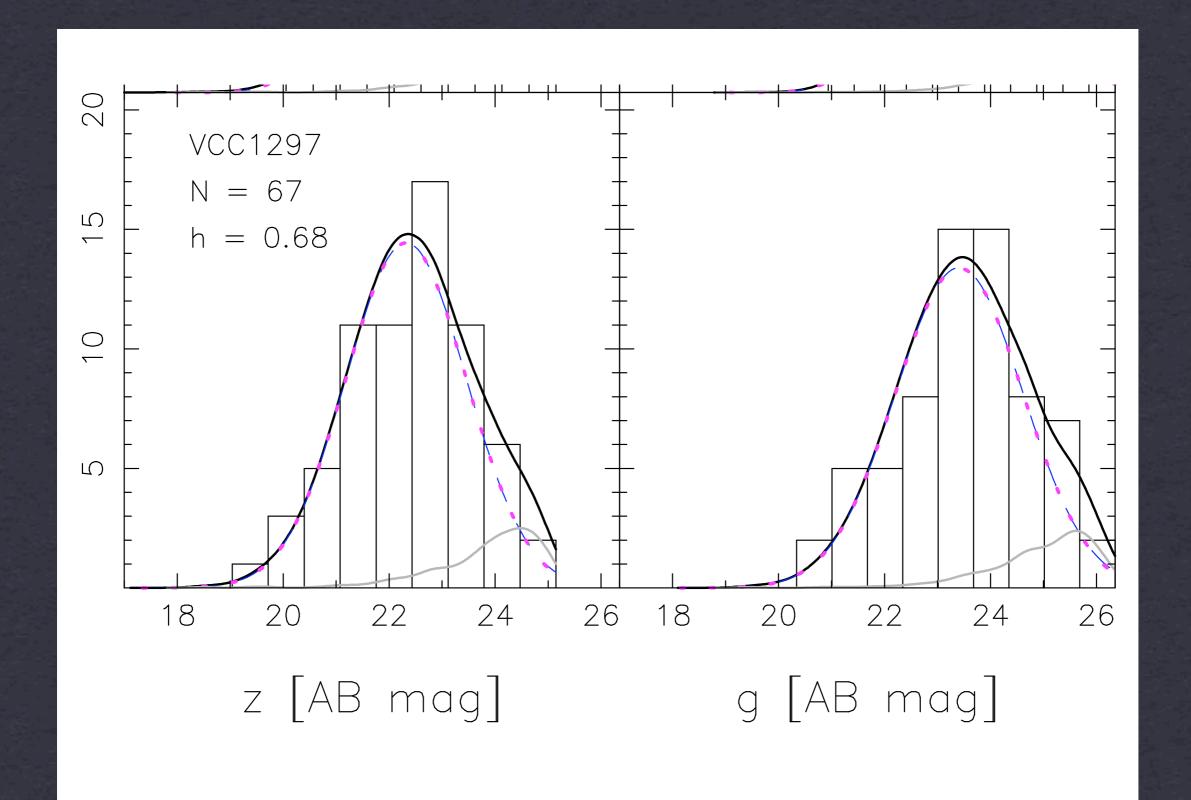
- 143 GALAXIES (100 IN VIRGO + 43 IN FORNAX).

- EACH GALAXY OBSERVED IN THE SLOAN G & Z BANDPASSES.

- SAMPLE SPANS A FACTOR OF 720 IN LUMINOSITY.

- TYPES E, S0, E, DS0, DE,N.

- 15,000 GLOBULAR CLUSTERS.

- RESULTS PUBLISHED IN 22 REFEREED PUBLICATIONS TO DATE.

- ACSVCS + ACSFCS PROVIDE SBF DISTANCES FOR MOST GALAXIES (BLAKESLEE ET AL. 2009)

THE ACS VIRGO & FORNAX CLUSTER SURVEYS.
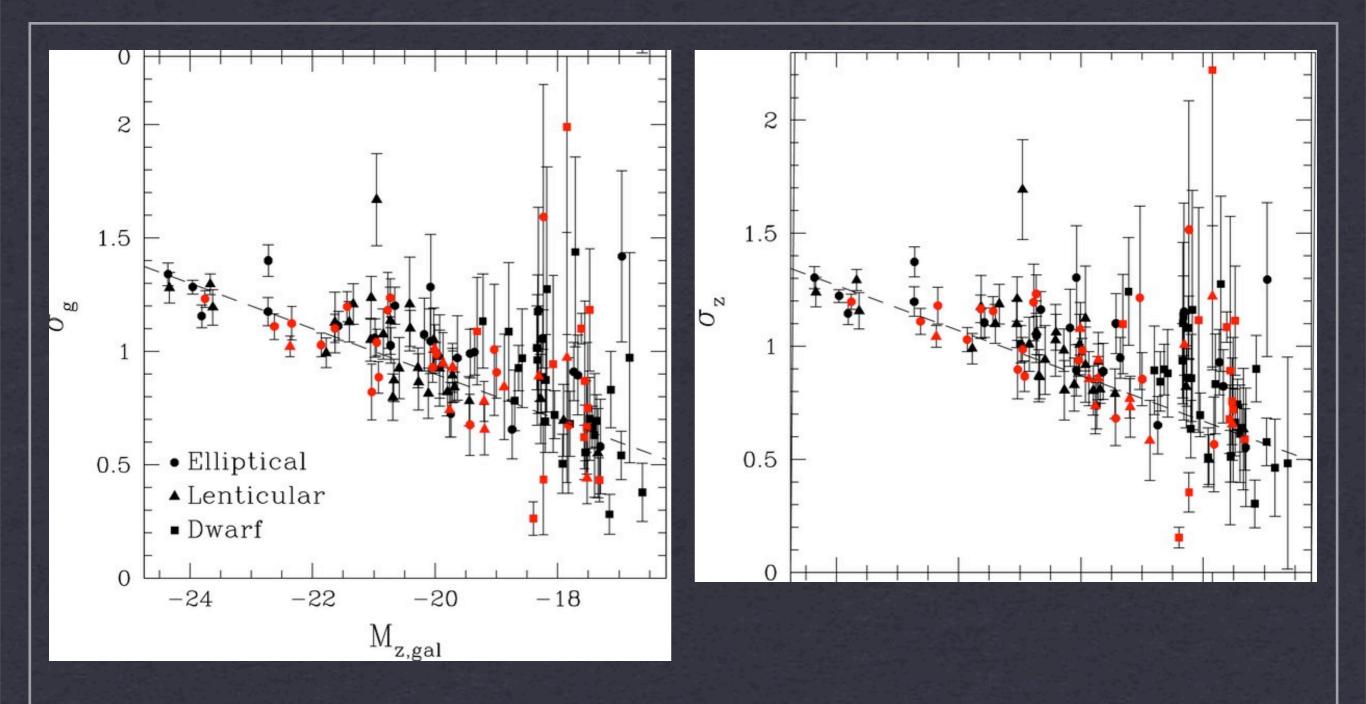
15,000 GCS IN 143 GALAXIES (MW ~160).

JORDÁN ET AL. 2006, 2007; VILLEGAS ET AL 2010.

VCC1297
N = 67
h = 0.68

z [AB mag]

g [AB mag]

15,000 GCS IN 143 GALAXIES (MW ~160).

JORDÁN ET AL. 2006, 2007; VILLEGAS ET AL 2010.
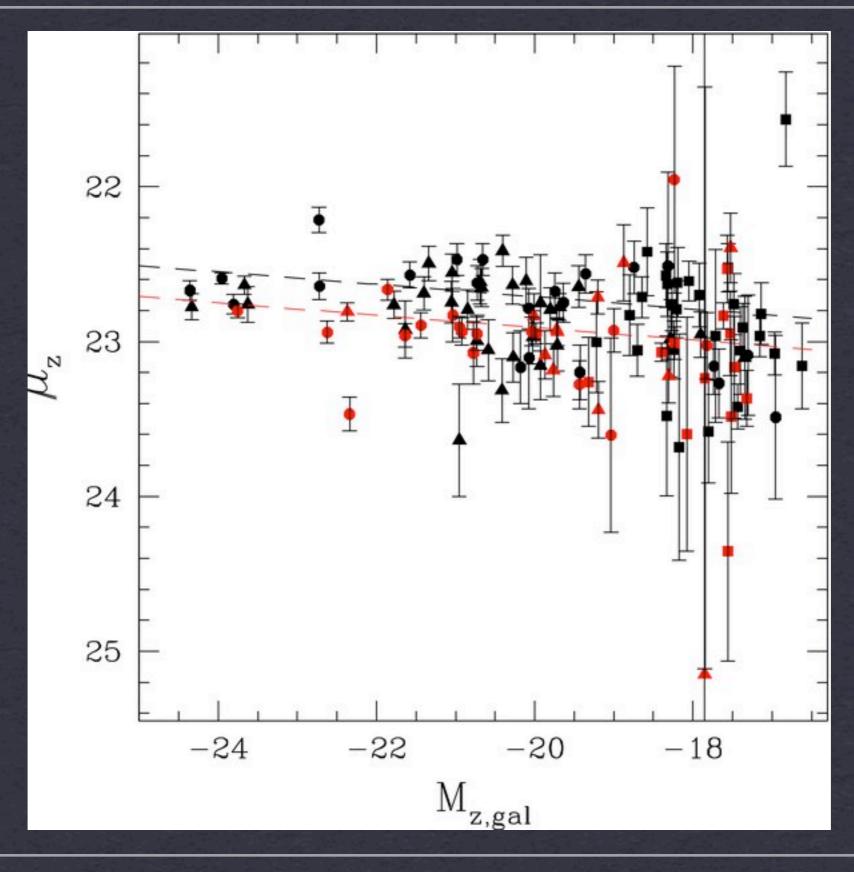
$$\sigma^2(\log L) = \sigma^2(\log M) + \sigma^2(\log \Upsilon)$$
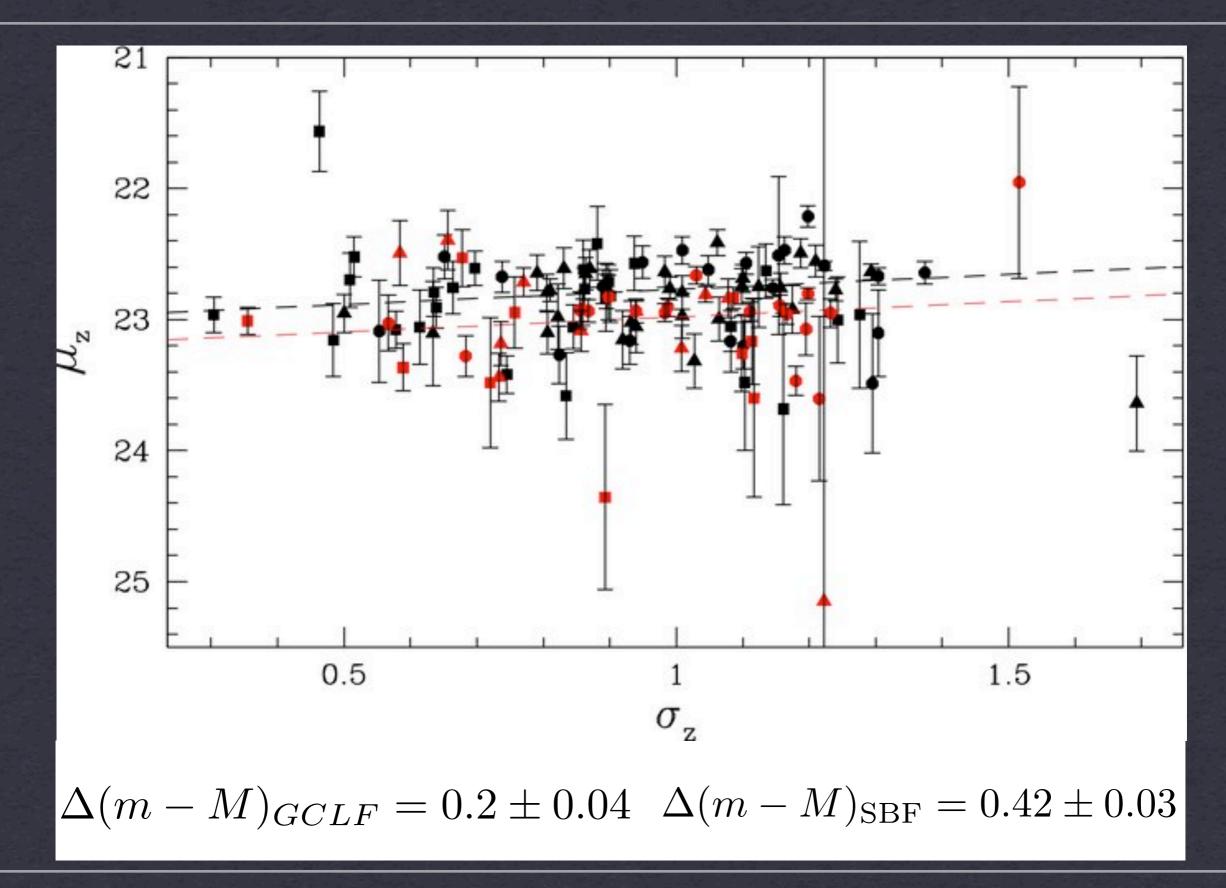
GC**M**F GETS NARROWER AS GALAXY MASS DECREASES
JORDÁN ET AL. 2006, 2007; VILLEGAS ET AL 2010.

GCMF GETS STEEPER FOR DWARFS FOR M > M_TO.

JORDÁN ET AL. 2006, 2007; VILLEGAS ET AL 2010.

SMALLER GALAXIES HAVE SLIGHTLY LOWER M_TO

JORDÁN ET AL. 2006, 2007; VILLEGAS ET AL 2010.

$$\Delta(m - M)_{GCLF} = 0.2 \pm 0.04 \quad \Delta(m - M)_{\mathrm{SBF}} = 0.42 \pm 0.03$$
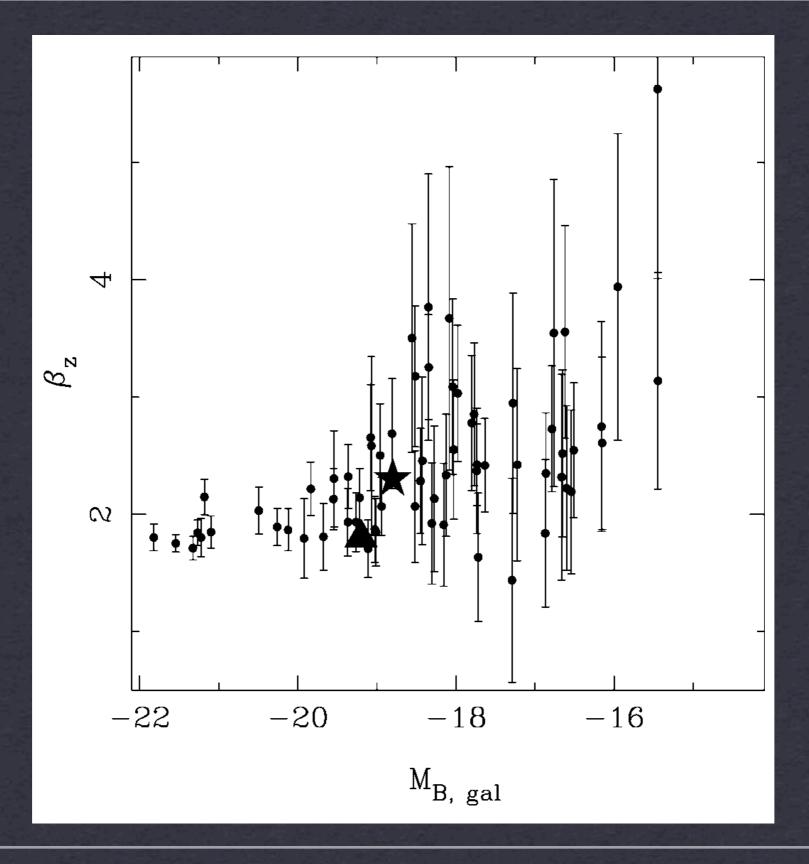
RELATIVE DIST. VIA GCLF NOT CONSISTENT WITH SBF

VILLEGAS ET AL 2010 (GCLF); BLAKESLEE ET AL 2009 (SBF).

Table 3
Literature Compilation of Relative Distance Modulus Between
Virgo and Fornax Clusters

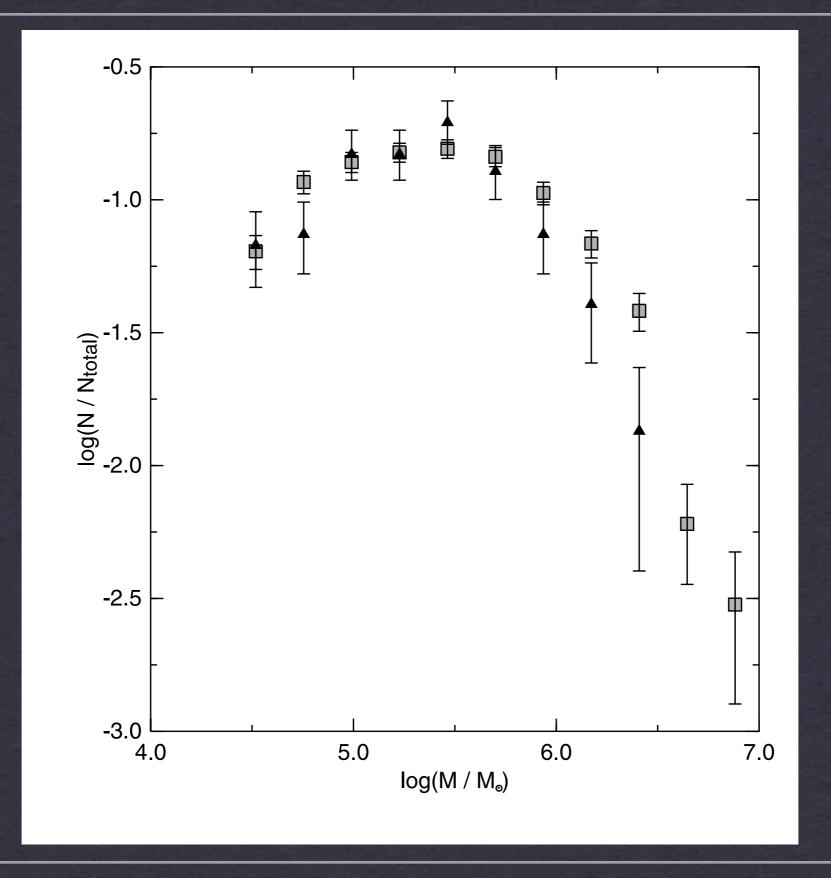| Method	$\Delta(m - M)$	Reference
Cepheids	0.47 ± 0.20	1
Fund. plane	0.45 ± 0.15	2
	0.52 ± 0.17	3
PNLF	0.35 ± 0.21	4, 5
	0.30 ± 0.10	6
GCLF	0.08 ± 0.09	7
	0.13 ± 0.11	8
	0.09 ± 0.27	6
	0.17 ± 0.28	9
SBF	0.42 ± 0.03	10

Note. The cited references are (1) Freedman et al. 2001; (2) D'Onofrio et al. 1997; (3) Kelson et al. 2000; (4) Ciardullo et al. 1998; (5) McMillan et al. 1993; (6) Ferrarese et al. 2000a; (7) Kohle et al. 1996; (8) Blakeslee & Tonry 1996; (9) Richtler 2003; (10) Blakeslee et al. 2009.

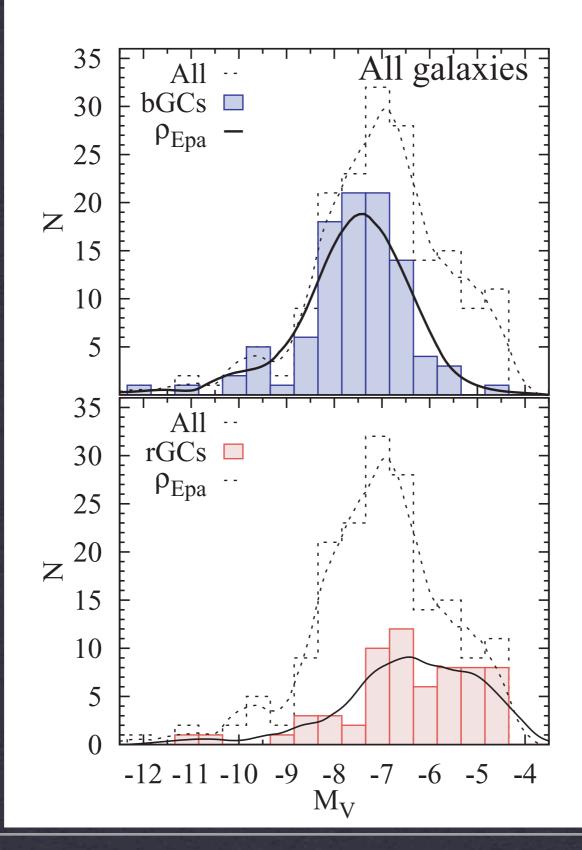# RELATIVE DIST. VIA GCLF NOT CONSISTENT WITH SBF

VILLEGAS ET AL 2010.

Going deeper, going to smaller galaxies.

DEEP: 30 ORBITS OF HST+WFPC2 ON M87.

◆ **GCLF shape is not universal (for masses above the turnover). It steepens for less massive galaxies. Initial conditions? Most likely.**

◆ **The GCLF turnover shows evidence of (small!) variations with galaxy mass, environment and (perhaps) morphology.**

◆ **GCLF turnover has systematics of ~0.2 mag as a distance indicator, and internal dispersion ~0.15 mag.**

C O N C L U S I O N S