

Virgo星系团中的超致密矮星系



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NGVS team

Zhang et al. 2015, ApJ, 802, 30
Mihos et al. 2015, ApJL, 809, 21
Liu et al. 2015, ApJL, 812, 2
Liu et al. 2015, ApJ, 812, 34

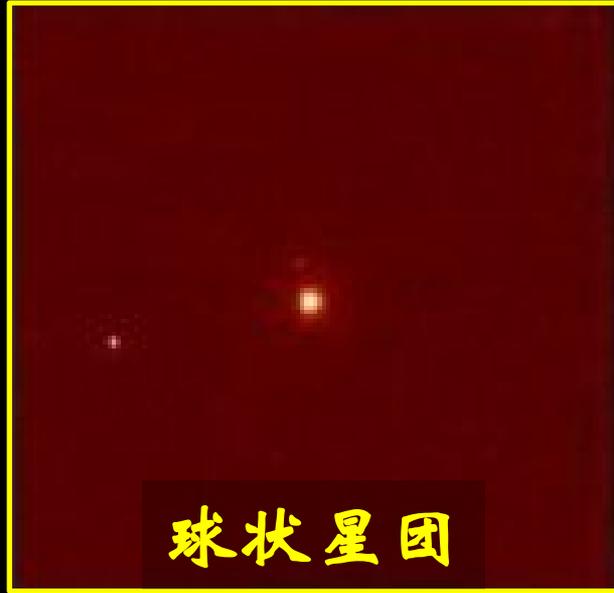
2015-11-20 @ SHAO

 The Next Generation Virgo Cluster Survey

The NGVS as it would appear in the sky
Photo Jean-Charles Cuillandre (2010)



什么是超致密矮星系 (UCD) ?

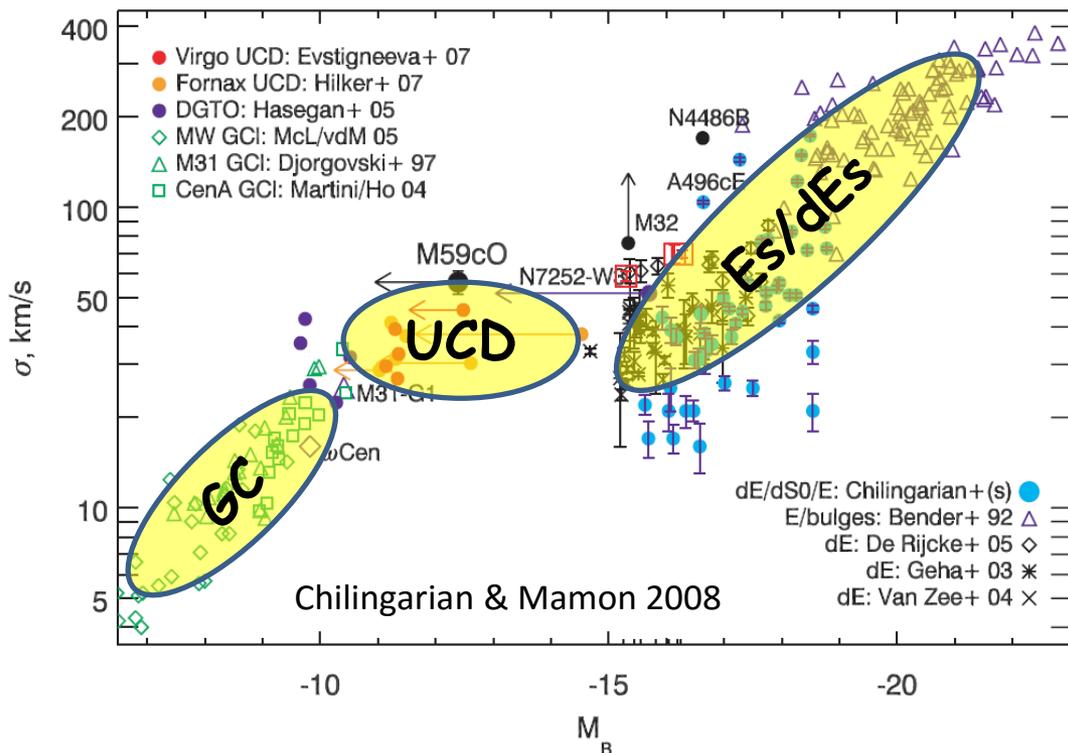
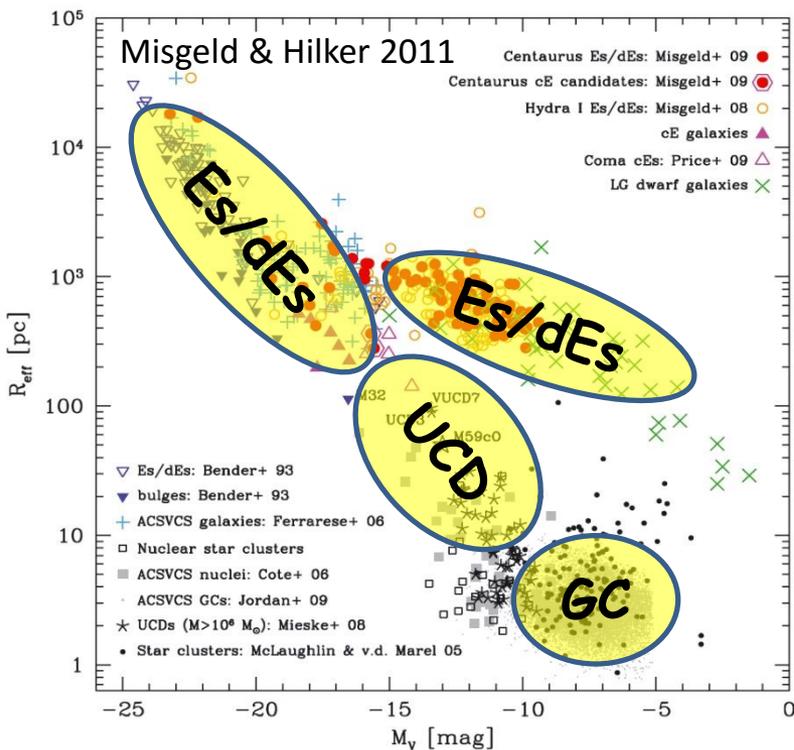


	GC	UCD	dE
Typical size	3 pc	10~100 pc	» 100 pc
Typical mass	$\sim 10^5 M_{\odot}$	$10^6 \sim 10^7 M_{\odot}$	$> 10^7 M_{\odot}$
Typical M/L_V	~ 2	3~6	» 6
DM halo	No	?	Yes

超致密矮星系是什么?

超致密矮星系的起源

大质量球状星团 or 星系核?



- 系统地比较球状星团、超致密矮星系、星系核
- 同质、完备的样本
- Virgo星系团

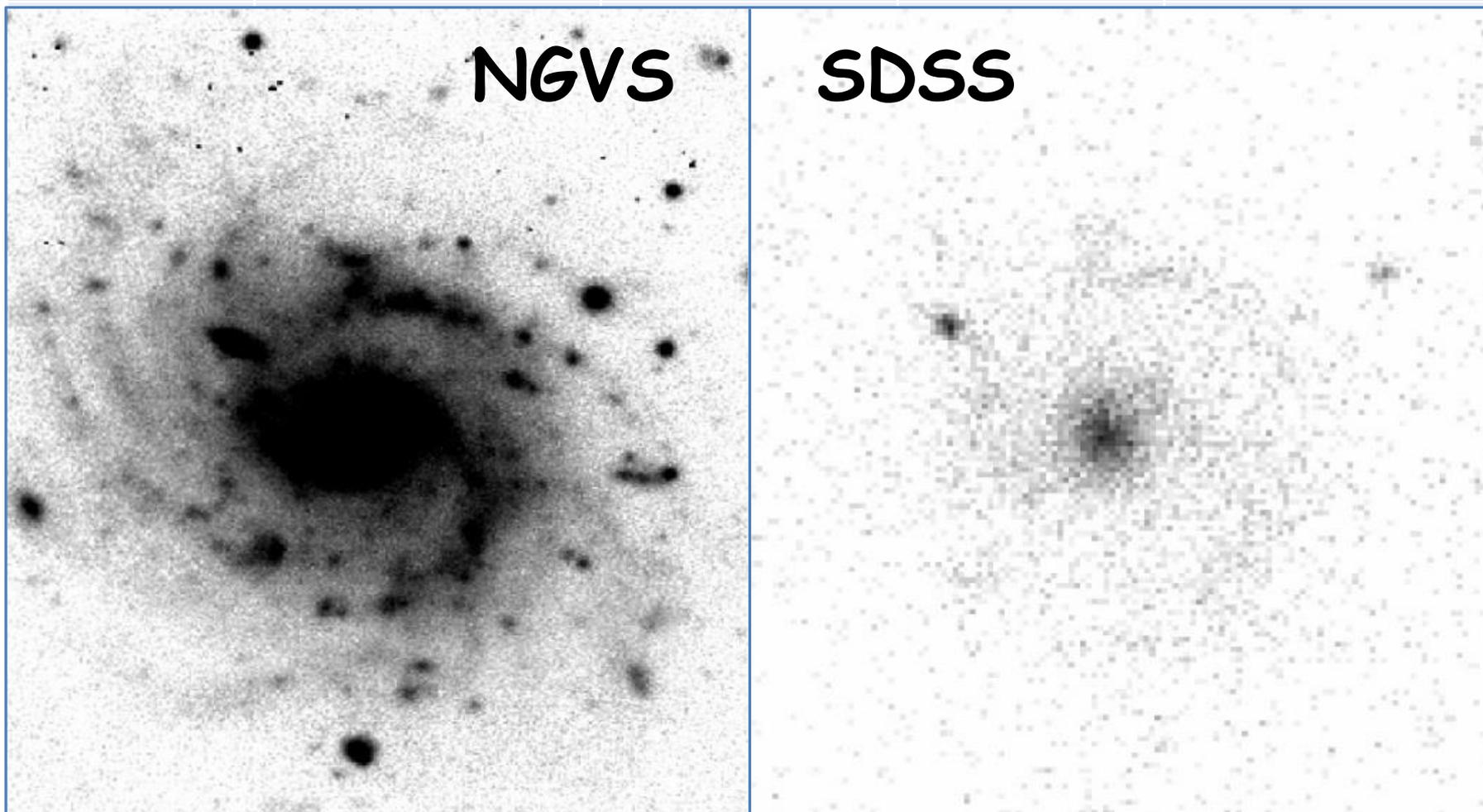
Virgo 星系团巡天

- 射电波段: FIRST, NVSS, VIVA (VLA), ALFALFA, AGES (Arecibo)...
- 红外波段: VIRGOFIR (Spitzer), HeViCS (Herschel), 2MASS, UKIDSS, SHIVir (CFHT/WIRCam)...
- 可见光: VCC, SDSS, ACSVCS (HST), NGVS (CFHT)...
- 紫外波段: GUViCS (GALEX)...
- X-ray: ROSAT's all-sky survey...

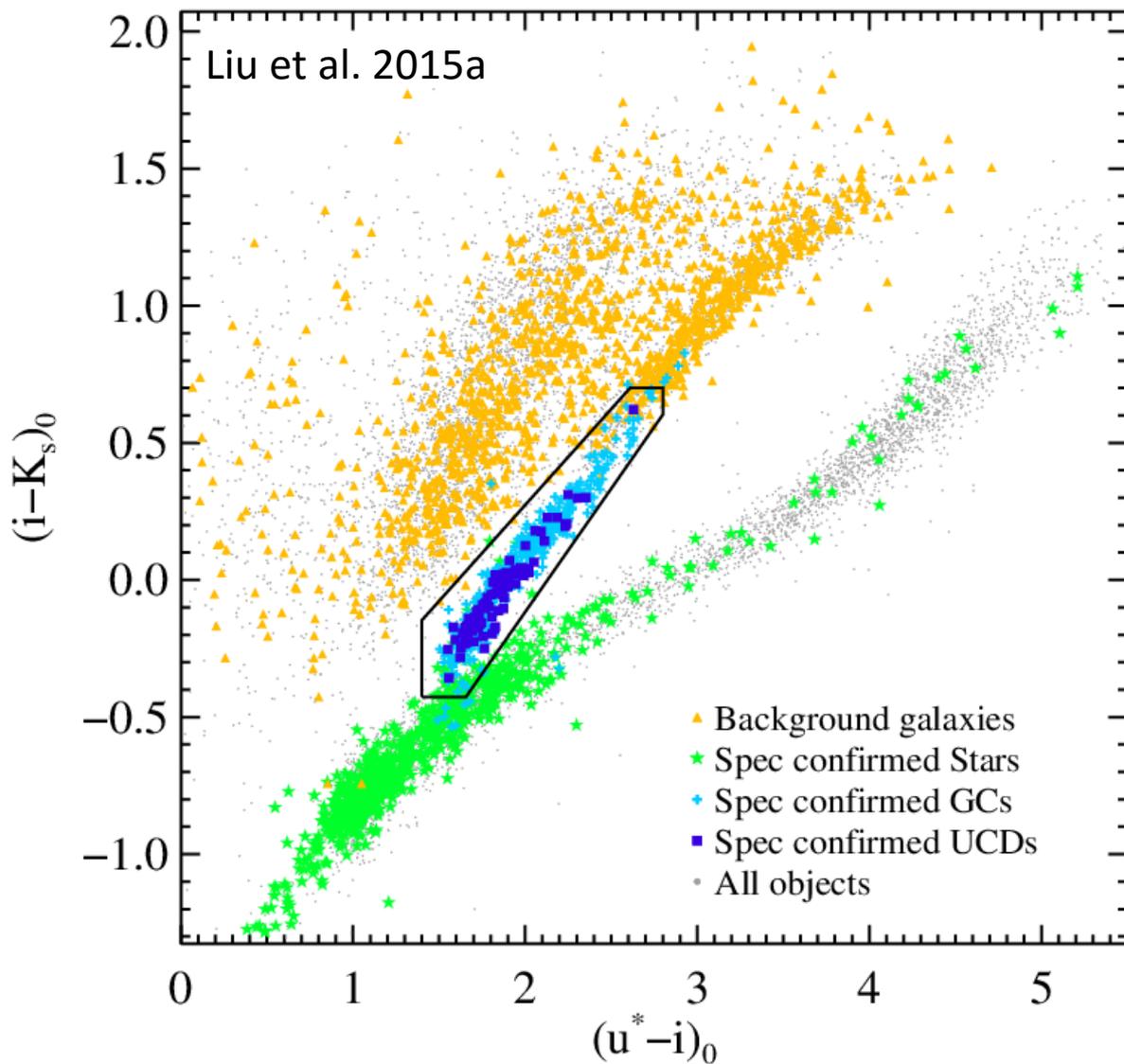


可见光波段的Virgo星系团巡天

	VCC	SDSS	ACSVCS	NGVS
完成时间	1985	2003?	2004	2013



Finding UCDs



結合双色图、
星等、
半光度半径、
面亮度等判据
选取样本：

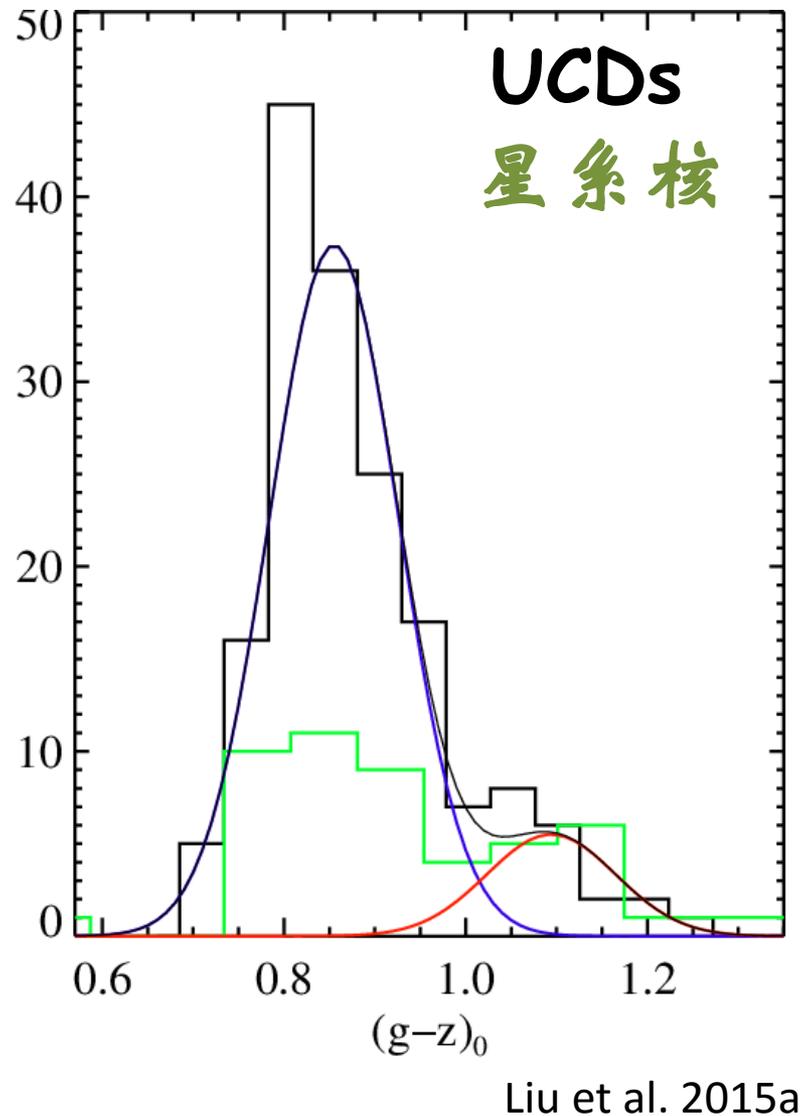
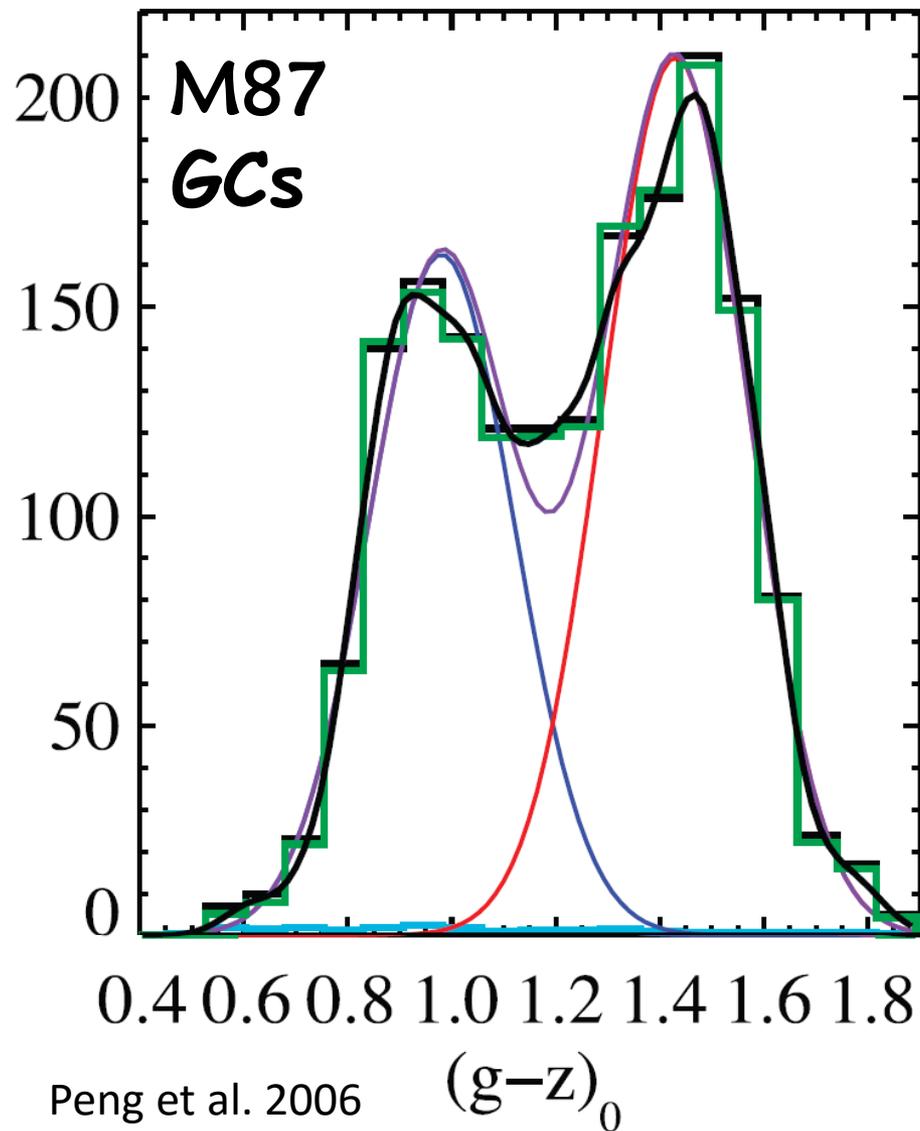
UCD ($r > 11 \text{pc}$)

GC ($r < 11 \text{pc}$)

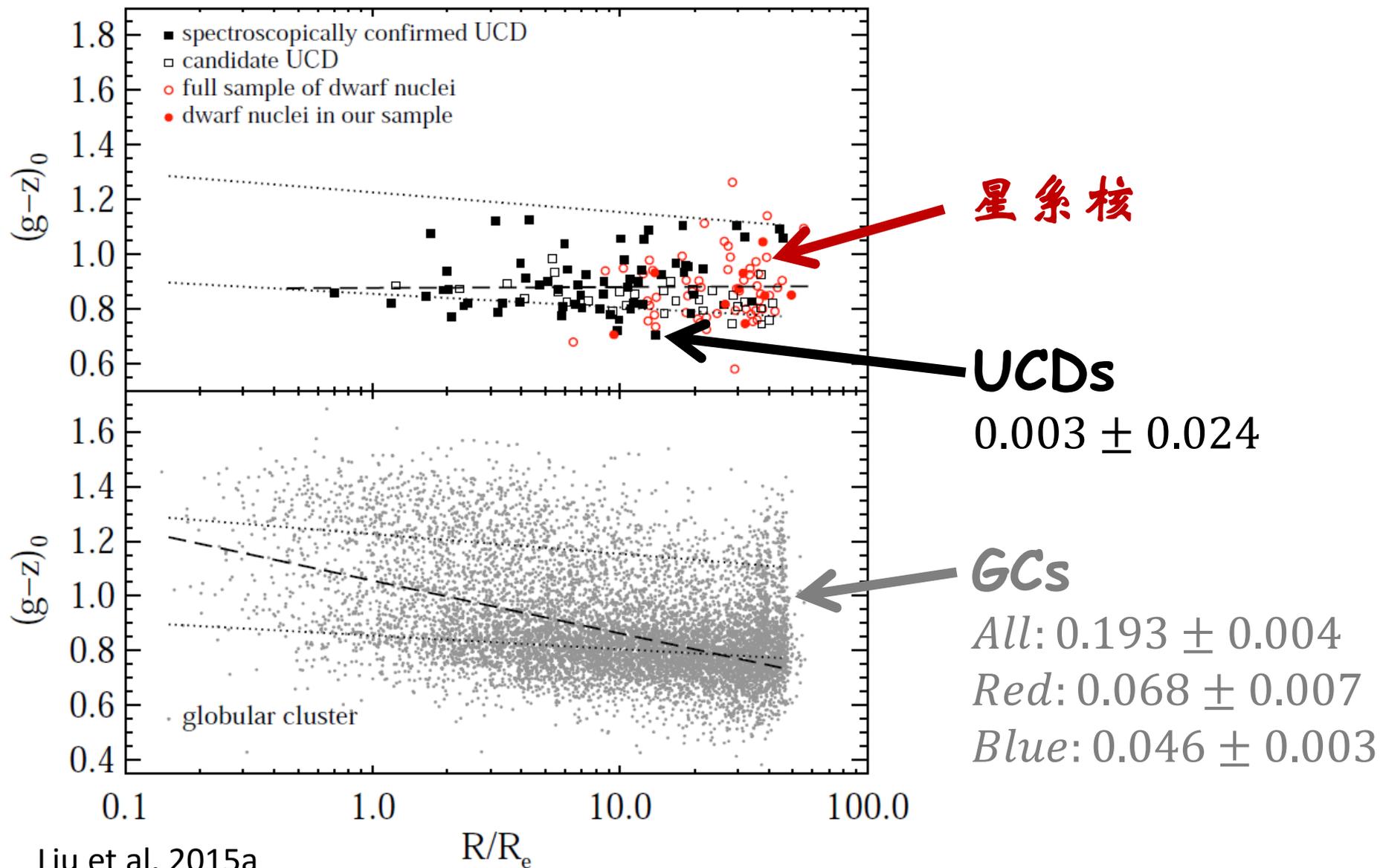
同时得到了星
系核样本

(Ferrarese et al.)

颜色分布

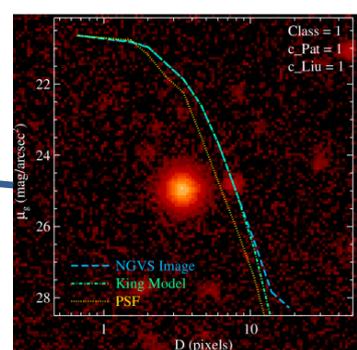
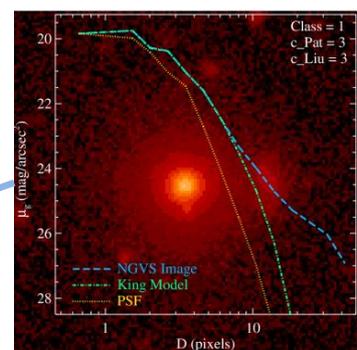
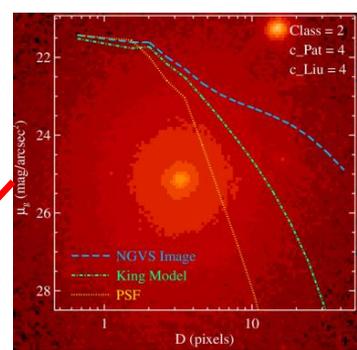
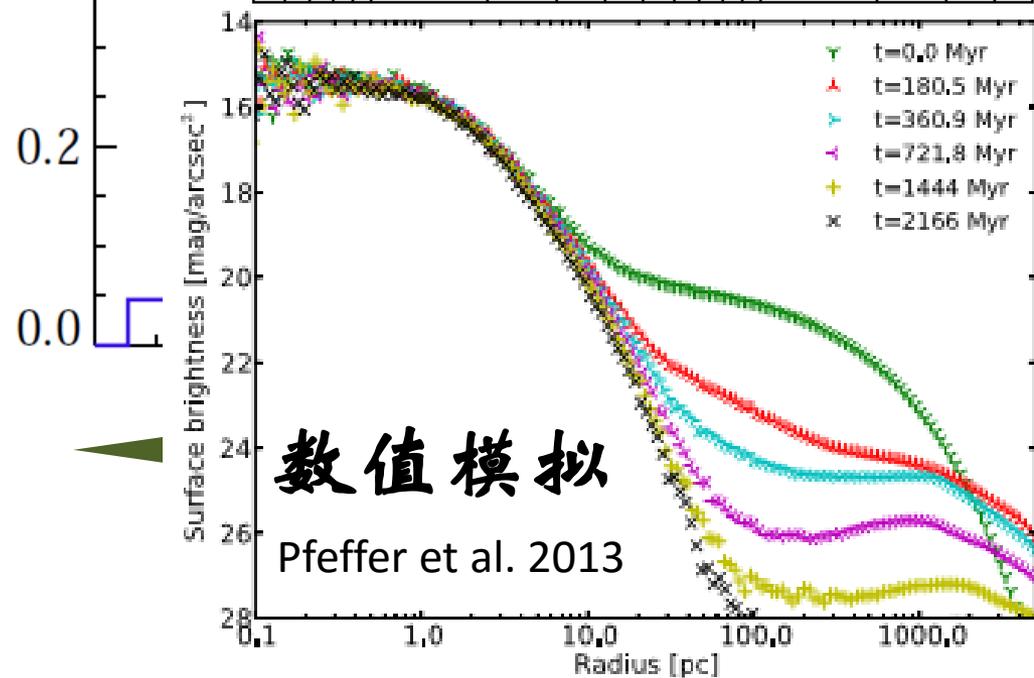
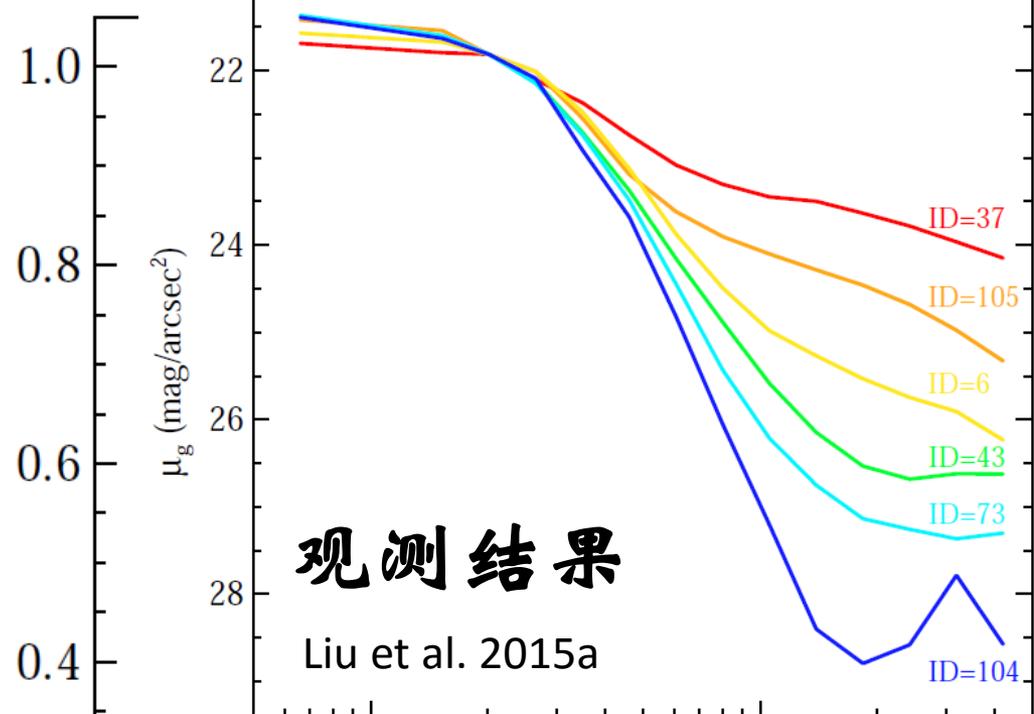


颜色梯度

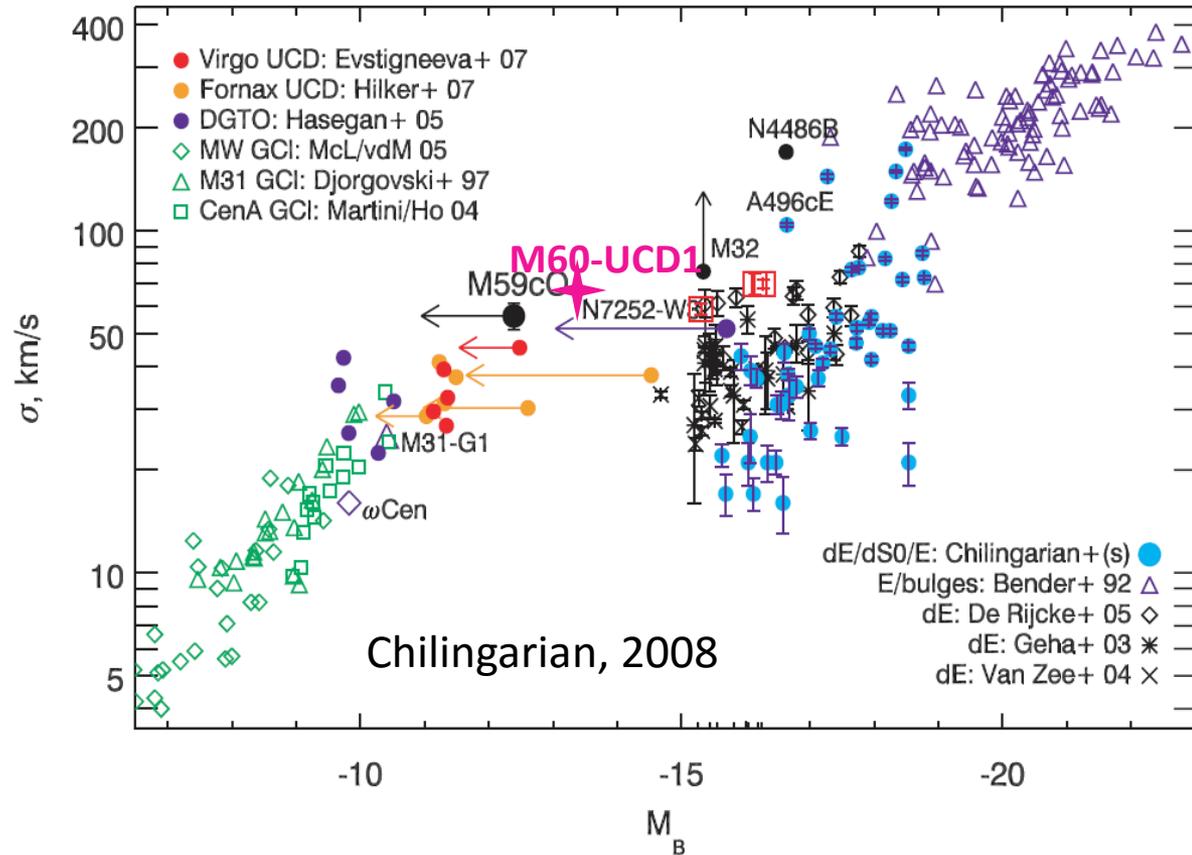
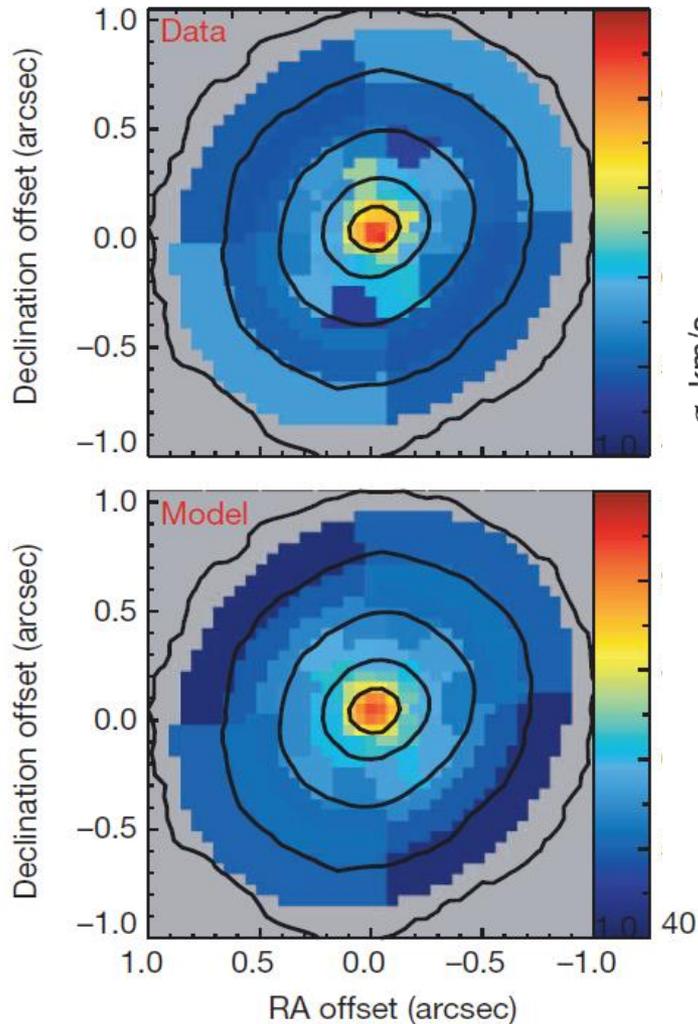


星系晕的剥离

Cumulative Fraction

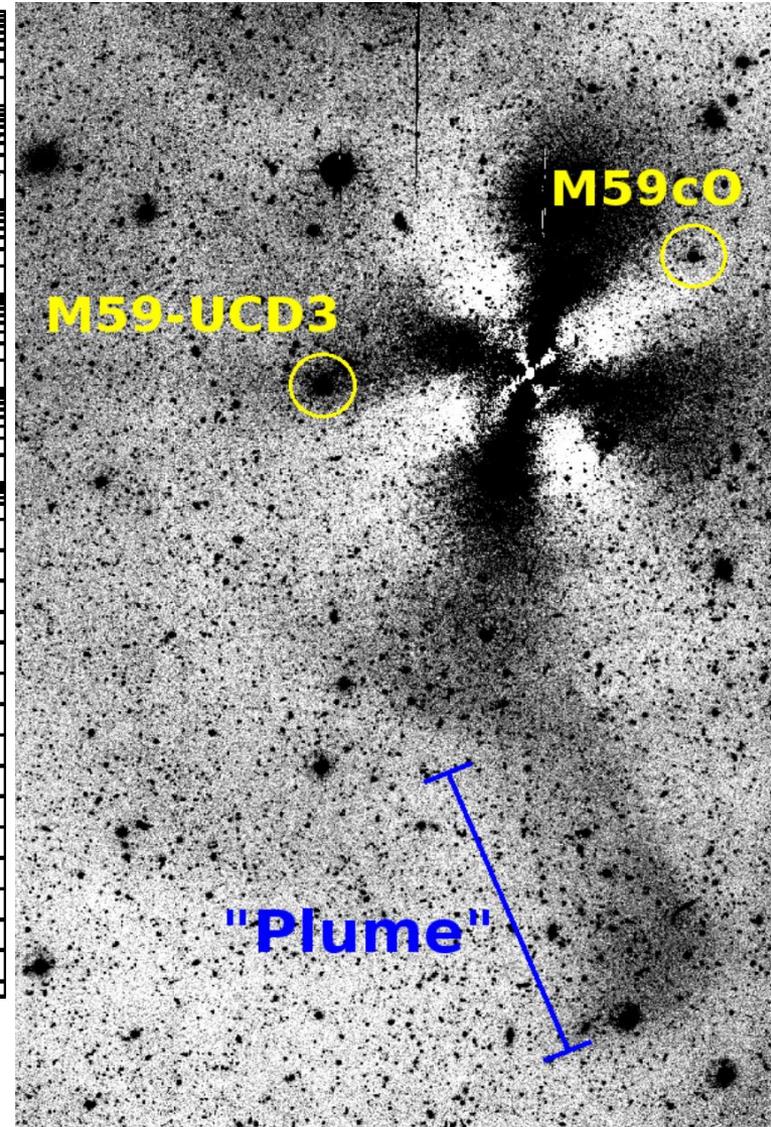
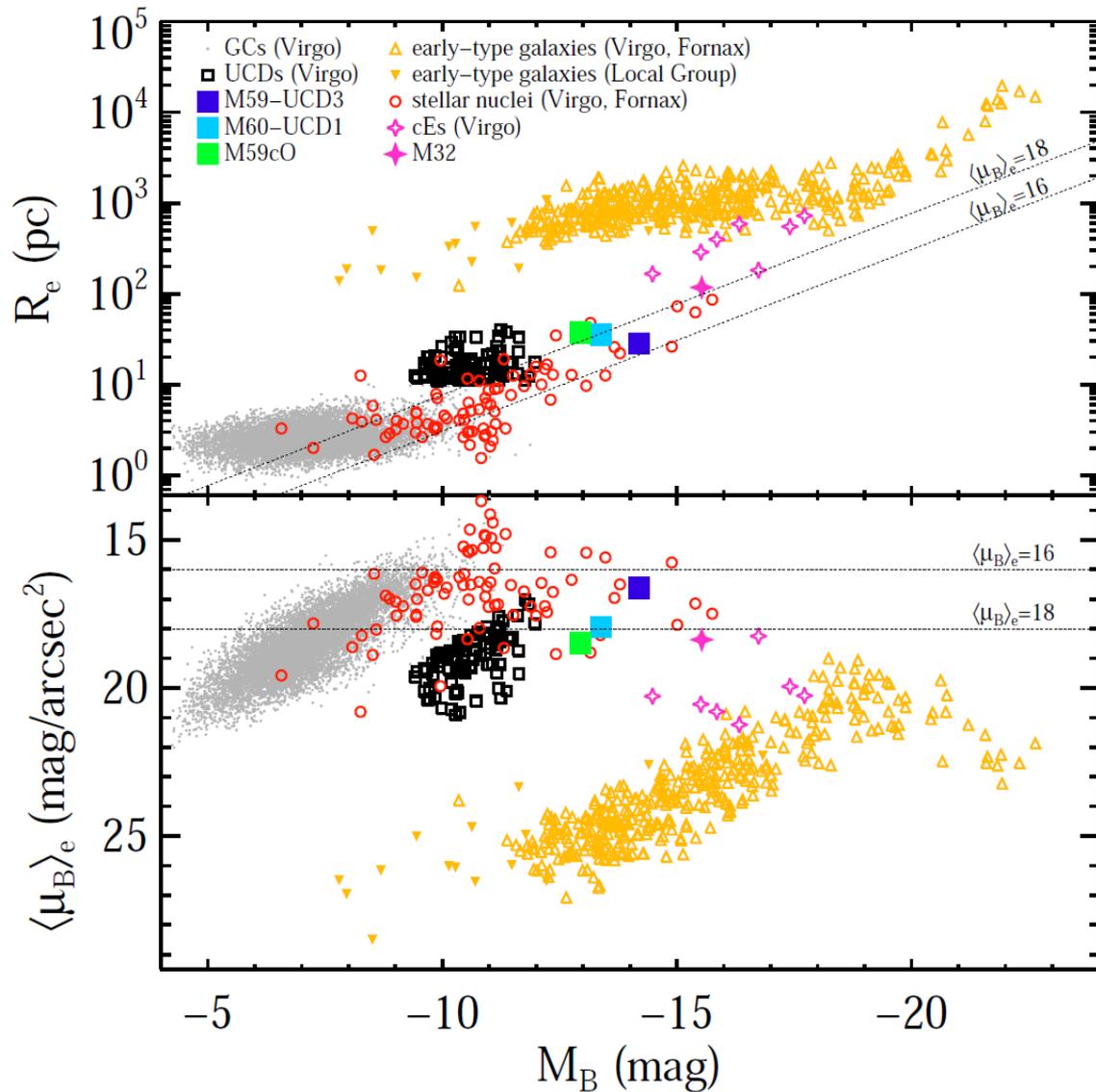


Bright UCDs

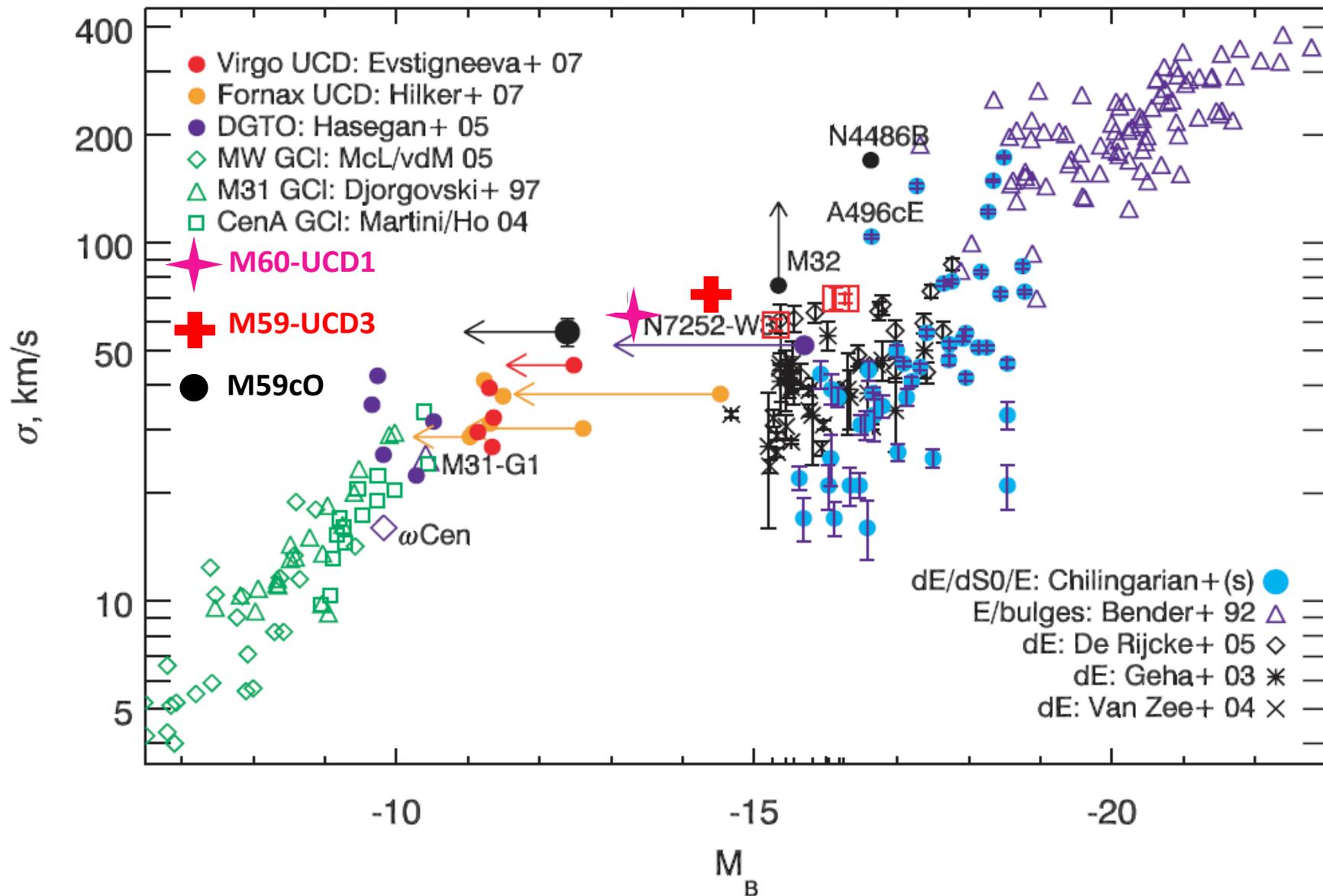


Link between UCDs and dwarf galaxies?

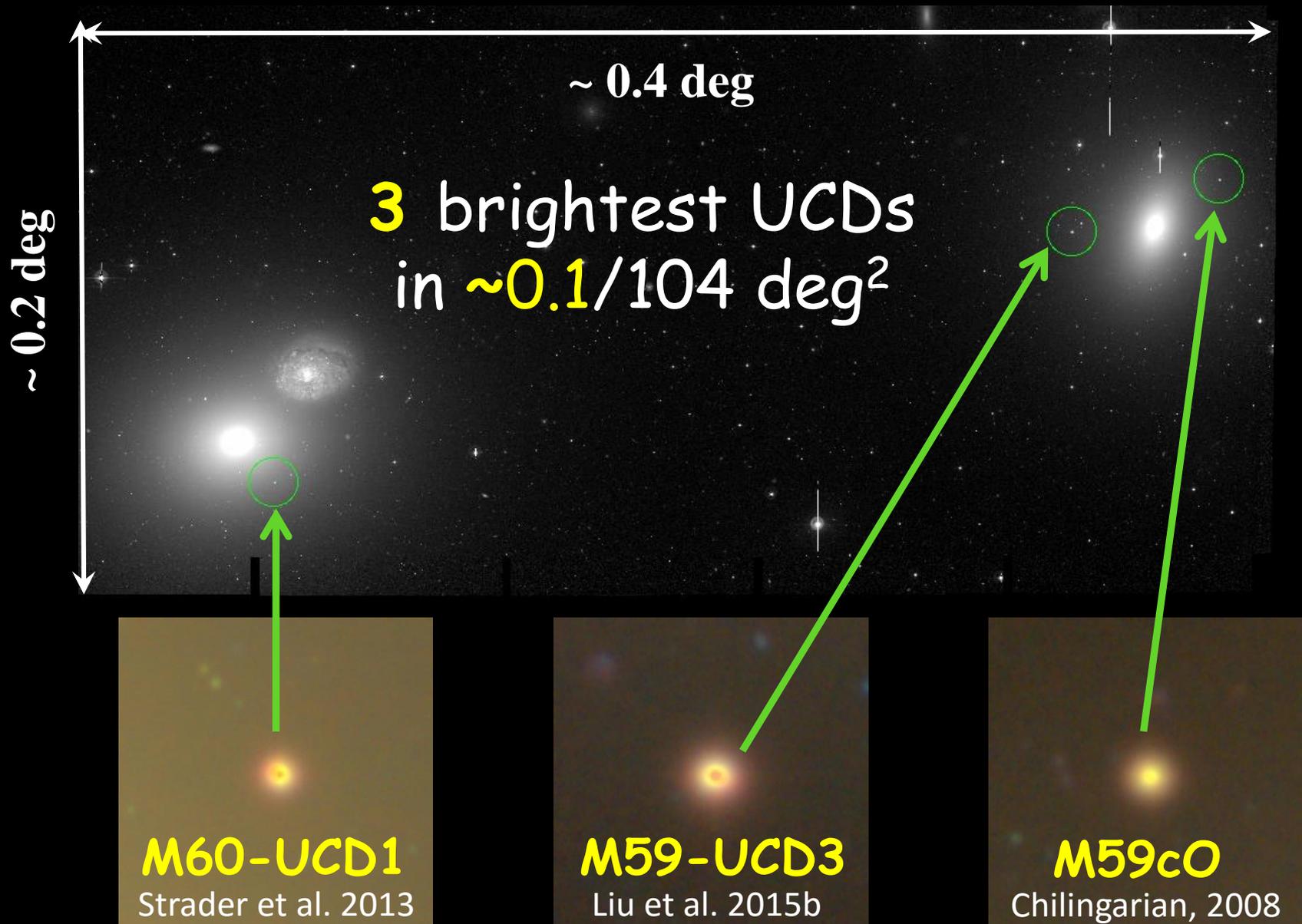
The Brightest UCD in Virgo



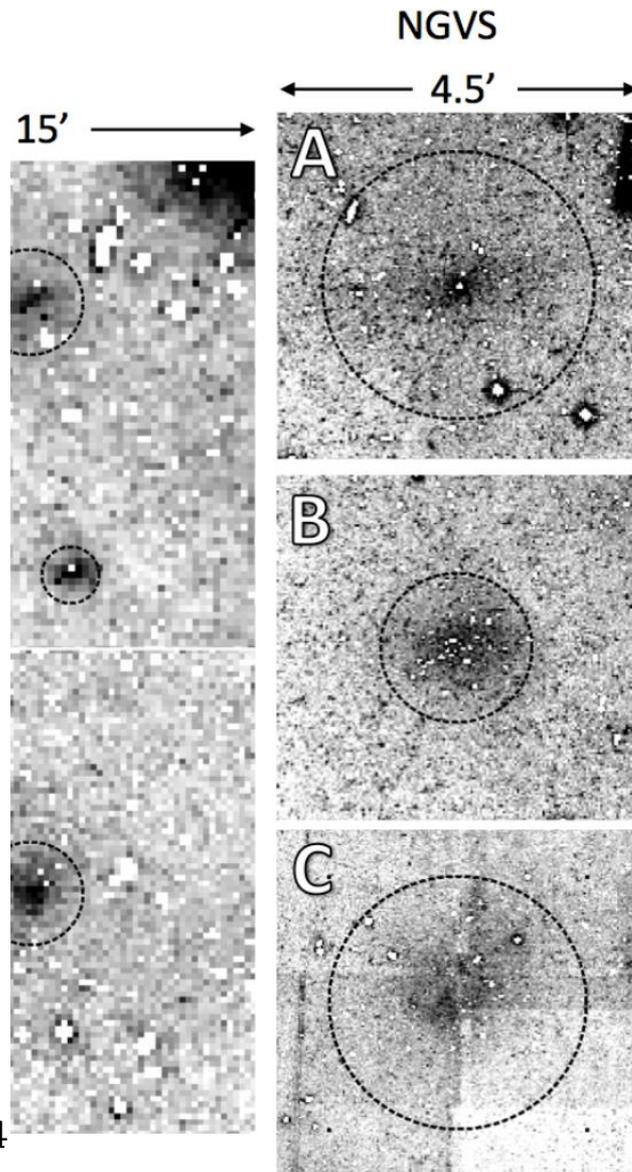
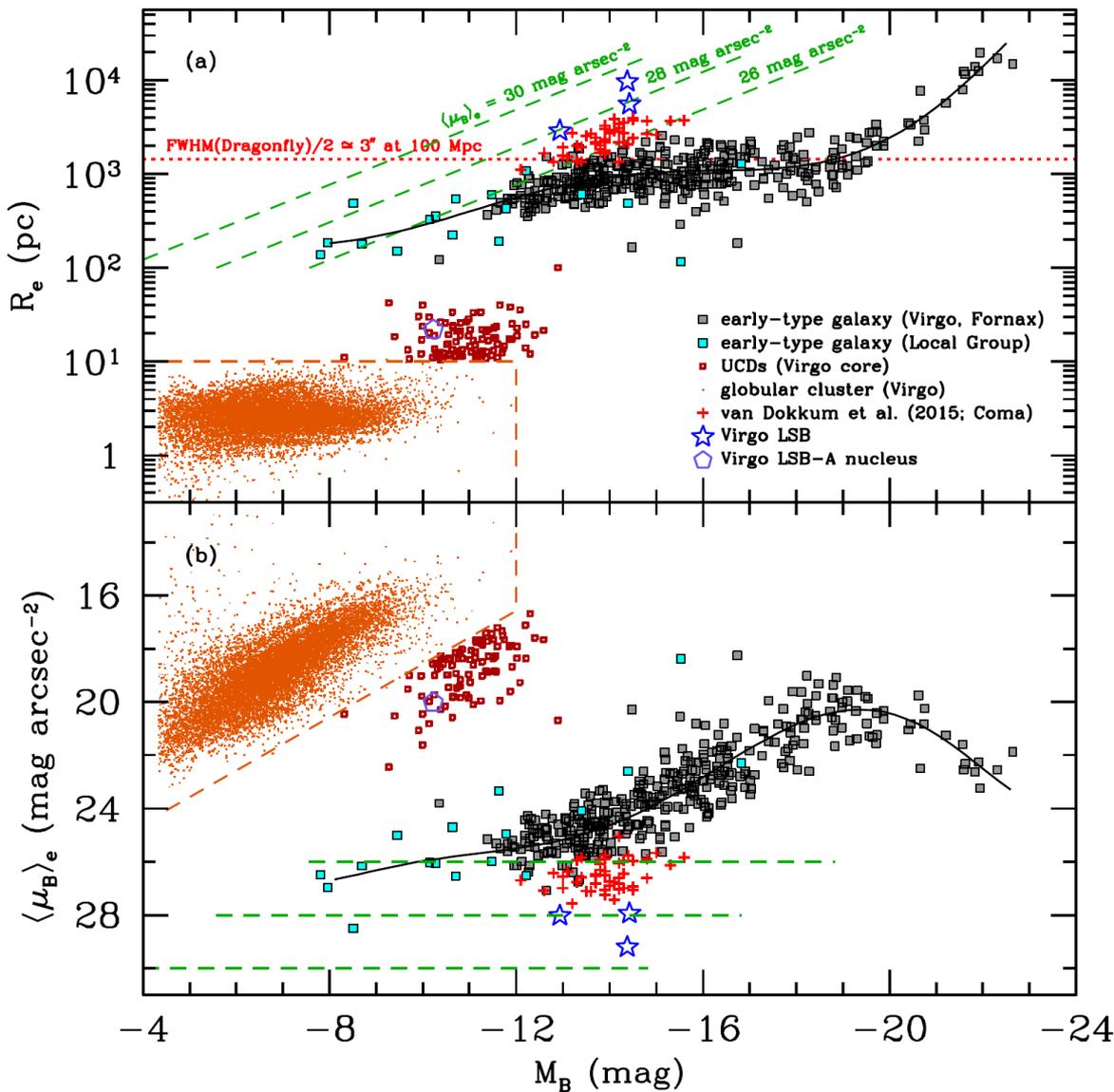
Faber-Jackson relation



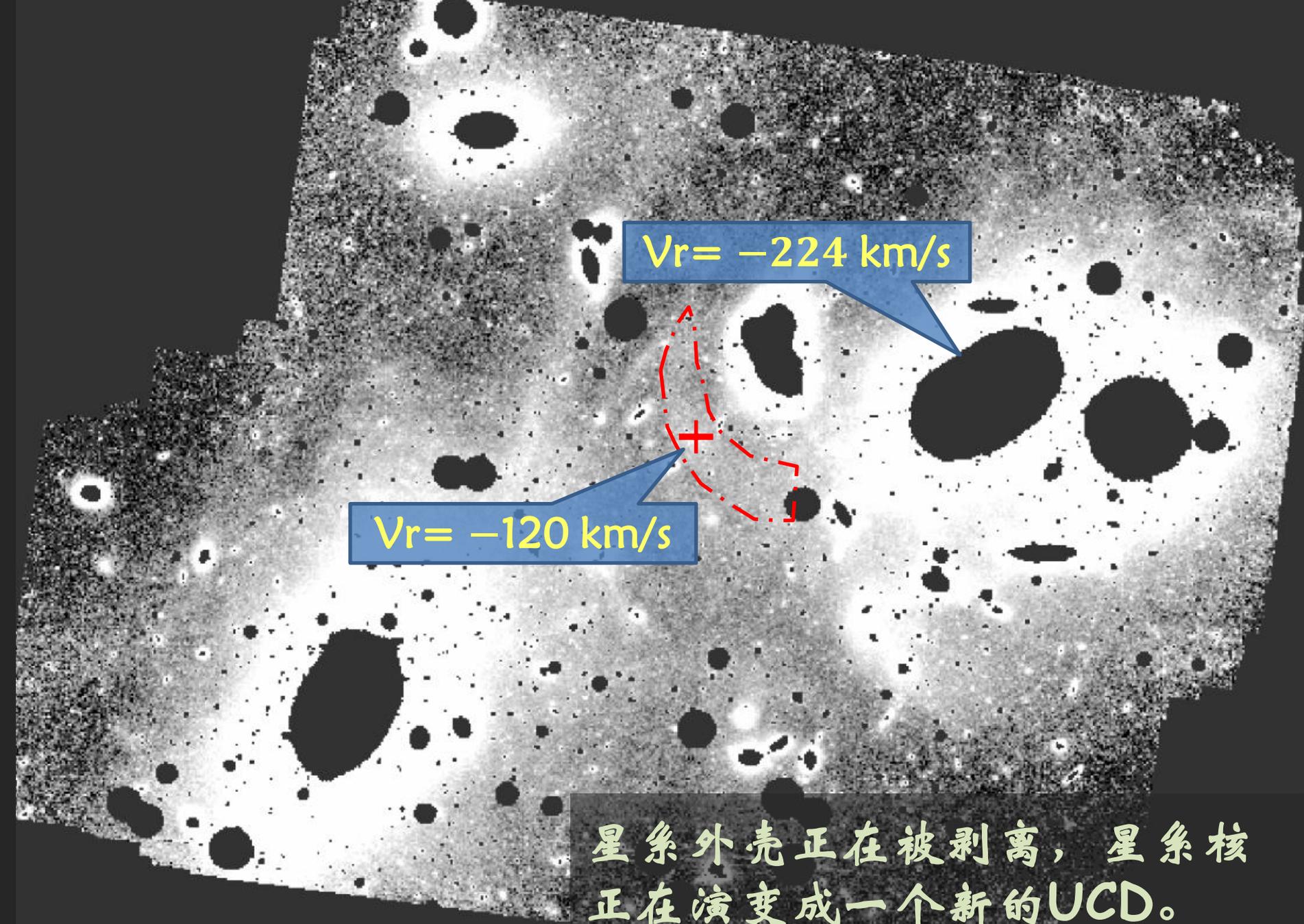
Bright UCDs in NGVS



另一个极端：Ultra-Diffuse Galaxy



Mihos, et al., 2015



星系外壳正在被剥离，星系核正在演变成一个新的UCD。

Summary

- 基于NGVS数据，我们使用系统地研究了UCD的性质，并比较了UCD，GC和星系核。
- 发现多个观测证据表明UCD是矮星系的外壳被剥离后剩下的星系核。
- 部分大质量球状星团是否也是矮星系残留的核？

