October 2-6, 2017 - Valletta, Malta

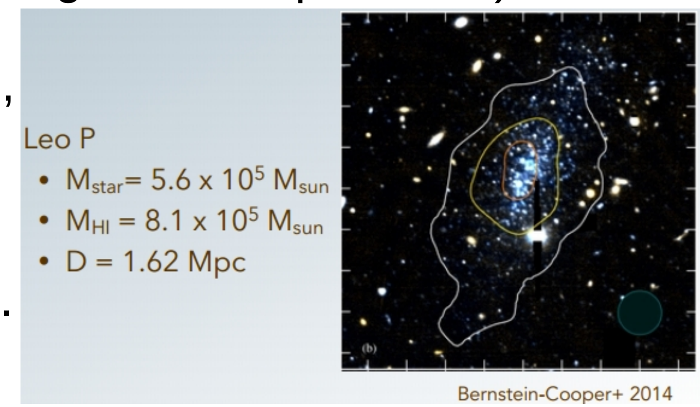
B. Adams

The kinematics of gas-rich ultra-faint dwarf galaxies

ALFALFA, UCHVC (ultra compact high velocity clouds) без известных оптических «двойников» - кандидаты в «темные» галактики (→ «missing satellites problem»).

Хороший пример такого подхода - Leo P, маломассивная, низкометалличная, с ЗО.

Объекты отбирались по размеру, степени изолированности, скоростям и поверхностной плотности. Однако нужно отделить галактики от HVCs



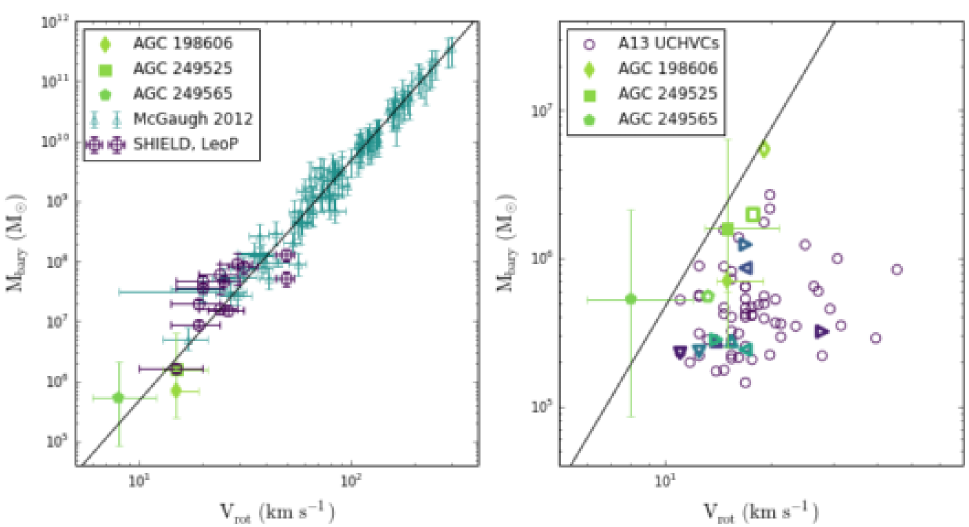
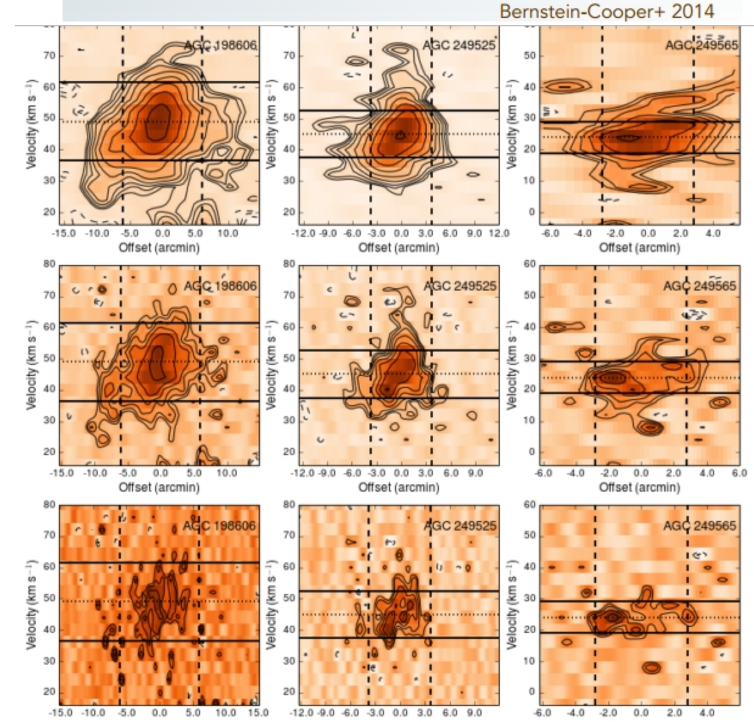


Fig. 7. Left: AGC 198606, AGC 249525 and AGC 249565 (the three galaxy candidates) shown on the Baryonic Tully-Fisher relation (BTFR) of McGaugh (2012) with Leo P and the SHIELD galaxies (Bernstein-Cooper et al. 2014; McNichols et al. 2016) shown for extension to low rotational velocities. Right: UCHVCs of A13 (open circles) and this work (open symbols, same colors and shapes as in Figures 2 and 3) shown on the BTFR based on their single-dish ALFALFA properties. The galaxy candidates are shown based on their rotation velocities derived in this work.



Adams et al, 2016

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Поиски оптических двойников - WIYN 3.5m telescope at Kitt Peak National Observatory

Применяли CMD-фильтры для разных расстояний, возрастов и металичности → расстояние, параметры галактик.

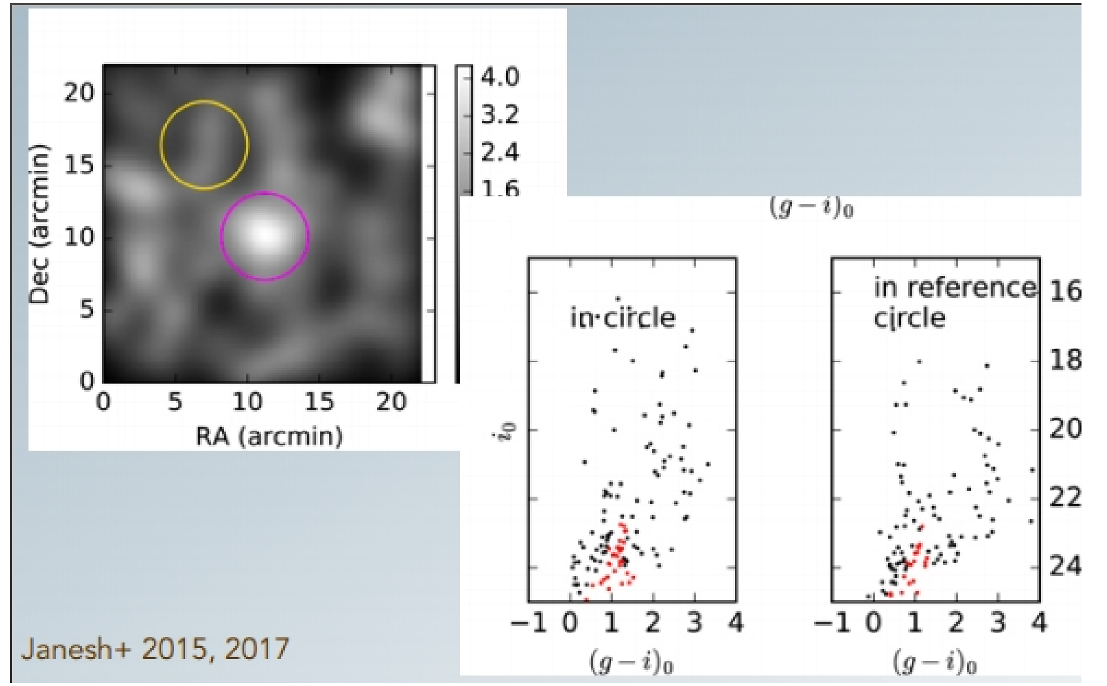

Table 1
Properties of AGC 198606 and Possible Optical Counterpart

Property	Value	
H I properties		
R.A.	09:30:02.5	
Decl.	+16:38:08	
$M_{\rm HI}$	$3.5 \times 10^6 d^2_{\rm Mpc}\ M_\odot$	
$\theta_{\rm HI}$	$11' \pm 1'$	
$a \times b$	$23' \times 16'$	
$r_{\rm HI}$	$3.3\ d_{\rm Mpc}$ kpc	
$M_{\rm dyn}$	$3.5 \times 10^8\ d_{\rm Mpc}\ M_\odot$	
$N_{\rm HI}$	6×10^{19} atoms cm^{-2}	
Estimated Optical Properties		
	Bright Limit	Faint Limit
Distance	378 kpc	
g	19.23 ± 0.09 mag	20.18 ± 0.10 mag
i	18.22 ± 0.09 mag	19.20 ± 0.17 mag
M_i	−4.67 ± 0.09 mag	−3.69 ± 0.17 mag
Stellar luminosity	$5.0 \times 10^3\ L_\odot$	$2.0 \times 10^3\ L_\odot$
Stellar mass-to-light ratio	2.36	2.27
Stellar mass	$1.2 \times 10^4\ M_\odot$	$4.6 \times 10^3\ M_\odot$
$M_{\rm HI}/M_{\rm stellar}$	42.5	110

Table 1
Properties of AGC 249525

Property	Value	
R.A. (J2000)	$14^{\rm h}\ 17^{\rm m}\ 53^{\rm s}.4$	
Decl. (J2000)	$17°\ 32'\ 42''.3$	
Distance	1.64 ± 0.45 Mpc	
cz	47 km s^{-1}	
H I mass	$3.2 \pm 0.9 \times 10^6\ M_\odot$	
H I radius	1.8 ± 0.5 kpc	
Rotational velocity	15^{+6}_{-2} km s^{-1}	
Dynamical mass	$1.6 \pm 0.5 \times 10^8\ M_\odot$	
	Lower Limit	Upper Limit
i_0	20.9 ± 0.02	18.20 ± 0.07
M_V	−4.5	−7.1
$(g-i)_0$	1.18 ± 0.02	1.41 ± 0.12
L_*	$7.7 \pm 2.1 \times 10^3\ L_\odot$	$9.6 \pm 2.6 \times 10^4\ L_\odot$
Stellar mass	$2.2 \pm 0.6 \times 10^4\ M_\odot$	$3.6 \pm 1.0 \times 10^5\ M_\odot$
$M_{\rm HI}/M_*$	144	9

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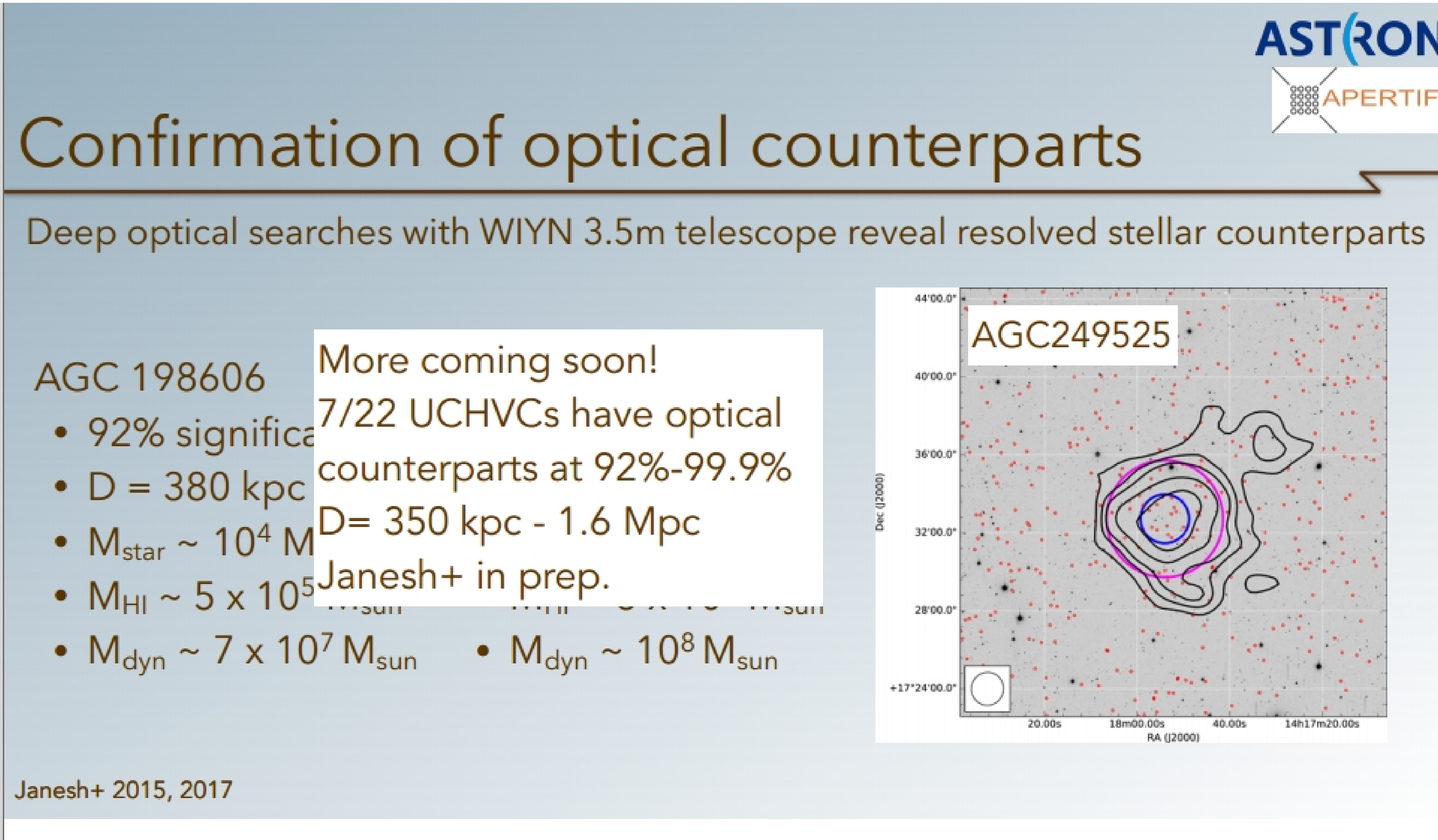

K. Spekkens

Late Accreters or Inefficient Star Formers? The Structure and Dynamics of Gas-Rich Massive Disk Galaxies

HighMass — high HI mass, HI-rich galaxies at z~0

На основе ALFALFA, M_HI>10^10M_sun, богатые газом для данной массы звезд (M_HI/Mstars>0.4). Аналоги галактик на 0.17<z<0.25 (GHz sample).
Откуда столько газа?

Всего 34 галактики в выборке, пока что исследовали 5 штук.
HI (VLA, GMRT), H2, Halpha

UGC12507 — LSB, с высоким угловым моментом темного гало.

У остальных — типичные SFR для их H2, SFE(HI) — тоже типичные.
Угловые моменты гало лишь немного выше среднего.
Галактики находятся в процессе перехода в фазу активного ЗО.

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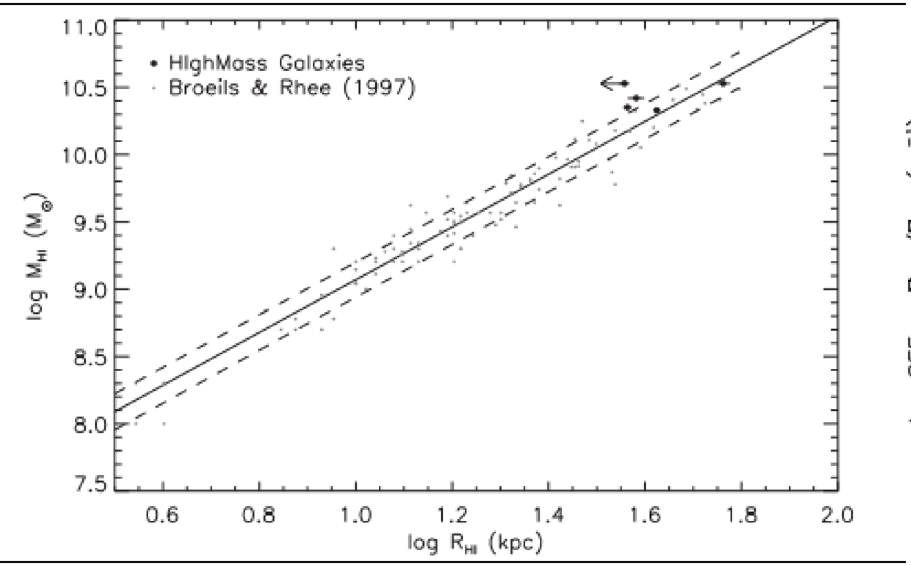

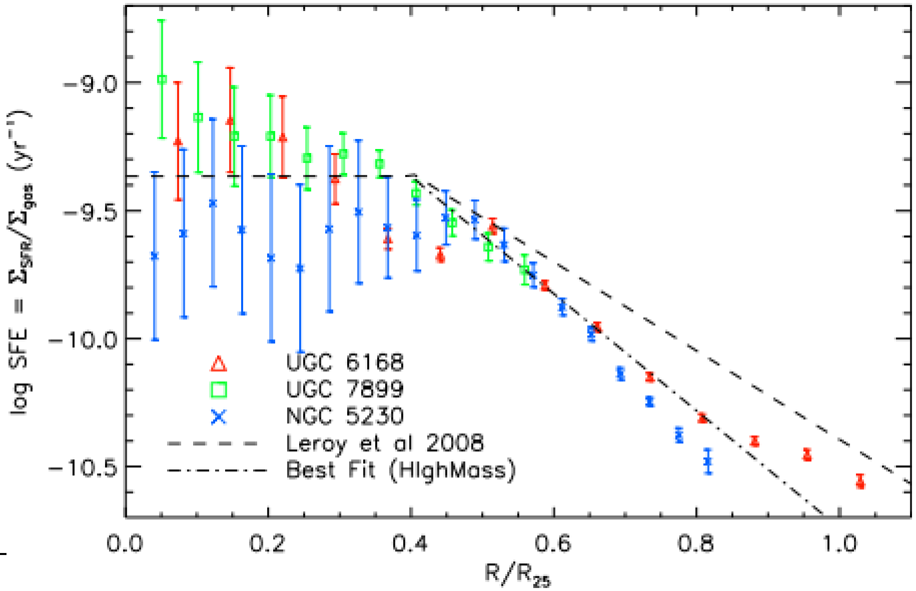

Figure 10. Total gas (H I, H_2, and He) SFE as a function of normalized galactic radius. Red open triangles are UGC 6168, green open squares are UGC 7899, and blue crosses are NGC 5230. The black dashed line represents a best-fit model for massive spirals found by THINGS (Leroy et al. 2008). The kink is near the transition from an H I-dominated to an H_2-dominated ISM; in the H I-dominated region, the SFE falls off exponentially with a scale length of 0.25 R_{25}. In the H_2-dominated central regions of each galaxy, the HIghMass galaxies follow the same trend as the massive THINGS spirals, but in the H I-dominated outskirts, the HIghMass galaxies are all significantly less efficient at forming stars. The narrower dot-dashed line is a best fit to the HIghMass galaxies alone, which have a shorter exponential scale length of 0.190(±0.001) R_{25}.