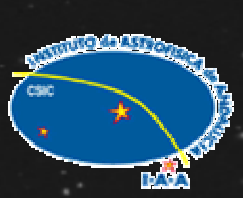
Ultra-compact emission-line galaxies unveiled in nearby Abell clusters

Daniel Reverte Payá
José Manuel Vílchez
Jorge Iglesias Páramo





Motivations

Environmental effects on Star Formation in Galaxies:

- ✓ Star formation in nearby cluster will provide a fundamental clue for the evolution of galaxies in dense environments.
- ✓ We aim to build up a firm local basis to compare with observations of field galaxies and in more distant clusters.
- ✓ Morphology of Hα emission as well as other structural parameters could be studied deeply.

The sample

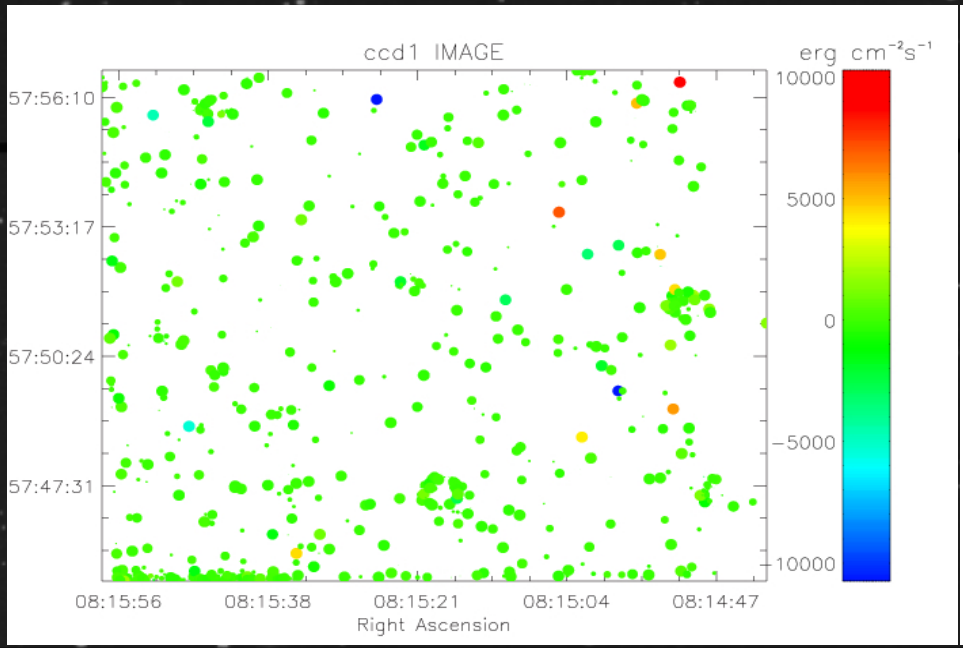
Name	Right Asc.[1]	Declinat.[1]	Vel[1]	Redshift[1]	σ_v[4] (km/s)	L_x(bol)[2]	BM type[1]	Richness Class[1]	Abell[3] Radius
Abell 400	$2^h\ 57^m\ 38.6^s$	+06° 02' 00"	7315	0.0244	610	7.56 ± 0.65	II-III	89	77
Abell 539	$5^h\ 16^m\ 35.1^s$	+06° 27' 14"	8514	0.0284	629	13.00 ± 0.28	III	111	62
Abell 634	$8^h\ 14^m\ 33.7^s$	+58° 02' 52"	7945	0.0265	391	*0.006:*	III		66
Abell 779	$9^h\ 19^m\ 50.8^s$	+33° 46' 17"	6742	0.0225	339	2.00 ± 0.19	I-II	83	75
Abell 1367	$11^h\ 44^m\ 29.5^s$	+19° 50' 21"	6595	0.0220	879	17.60 ± 0.52	II-III	85	80
Abell 1656	$12^h\ 59^m\ 48.7^s$	+27° 58' 50"	6925	0.0231	1008	156.0 ± 8.30	II	484	74
Abell 2666	$23^h\ 50^m\ 56.2^s$	+27° 08' 41"	8042	0.0268	518	*0.095:*	I	49	64

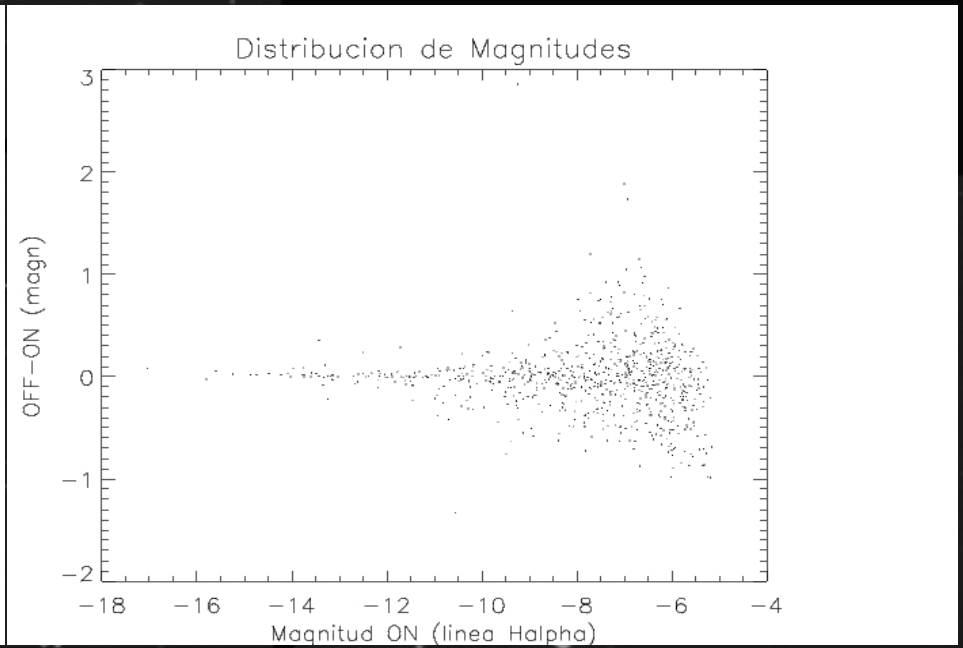
(1) Data taken from NASA Extragalactic Database.
(2) Data taken from White, Jones & Forman (1997).
(3) Data taken from Abell, Corwin & Olowin (1989).
(4) Others.

Spectroscopical Follow Up of Emitters

Candidates Preselection:

- Automatic and visual Inspection

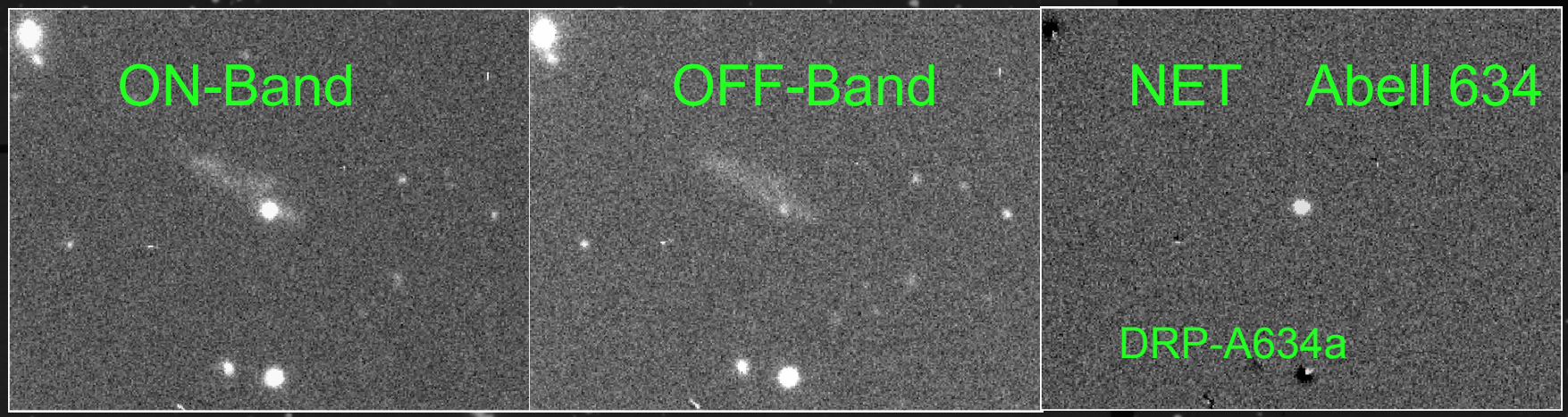


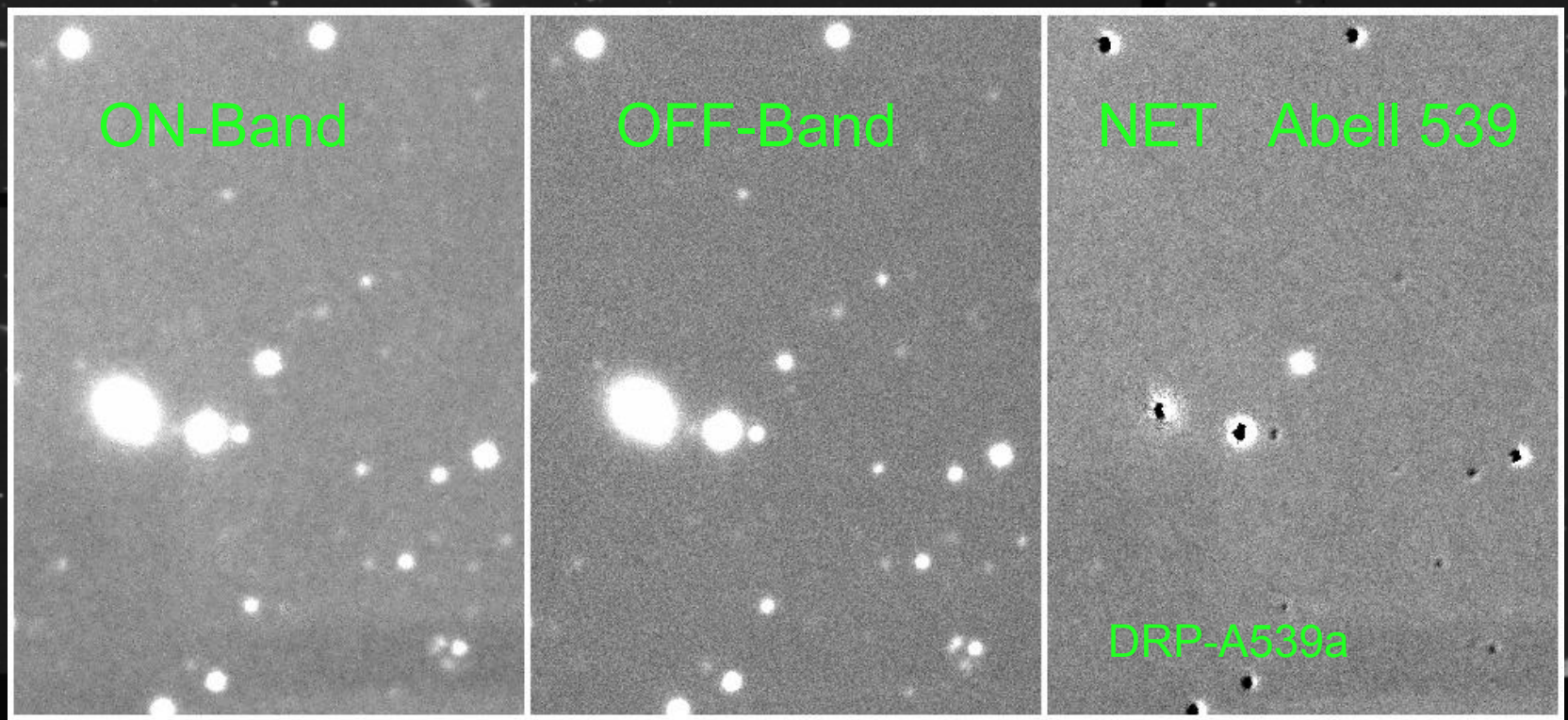


Carry Out with a Extended set of telescopes

1.- William Herschel (AutoFib2 -WYFFOS)
2.- NOT (Alfosc)
3.- 2.2m CAHA (Cafos)
4.- OSN (Albireo)

First Two Compacts Emission-line Objects Hunted





Observations Logs NOT alfosc

DRP-A634a

Date	Spec.Range	Time	Slit.Width
2004-11-19	3700-6100	1800 s	0.4”
2004-11-19	6000-8000	1800 s	0.4”
2004-12-09	6000-8000	680 s	1.0”

DRP-A539a

2004-12-09	3700-6100	3x1800 s	1.0”
2004-12-09	6000-8000	3x1800 s	1.0”

Reddening Correction

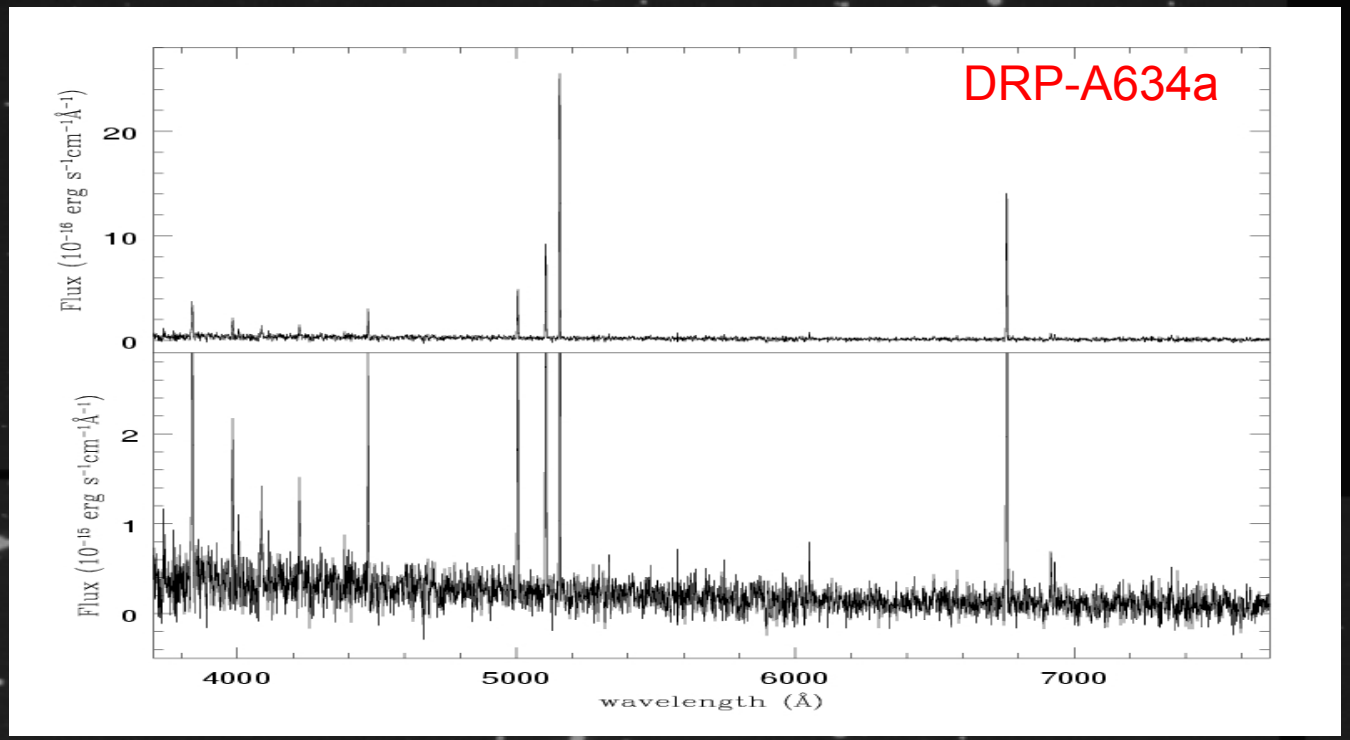
C(Hβ) extracted from first 4 balmer lines

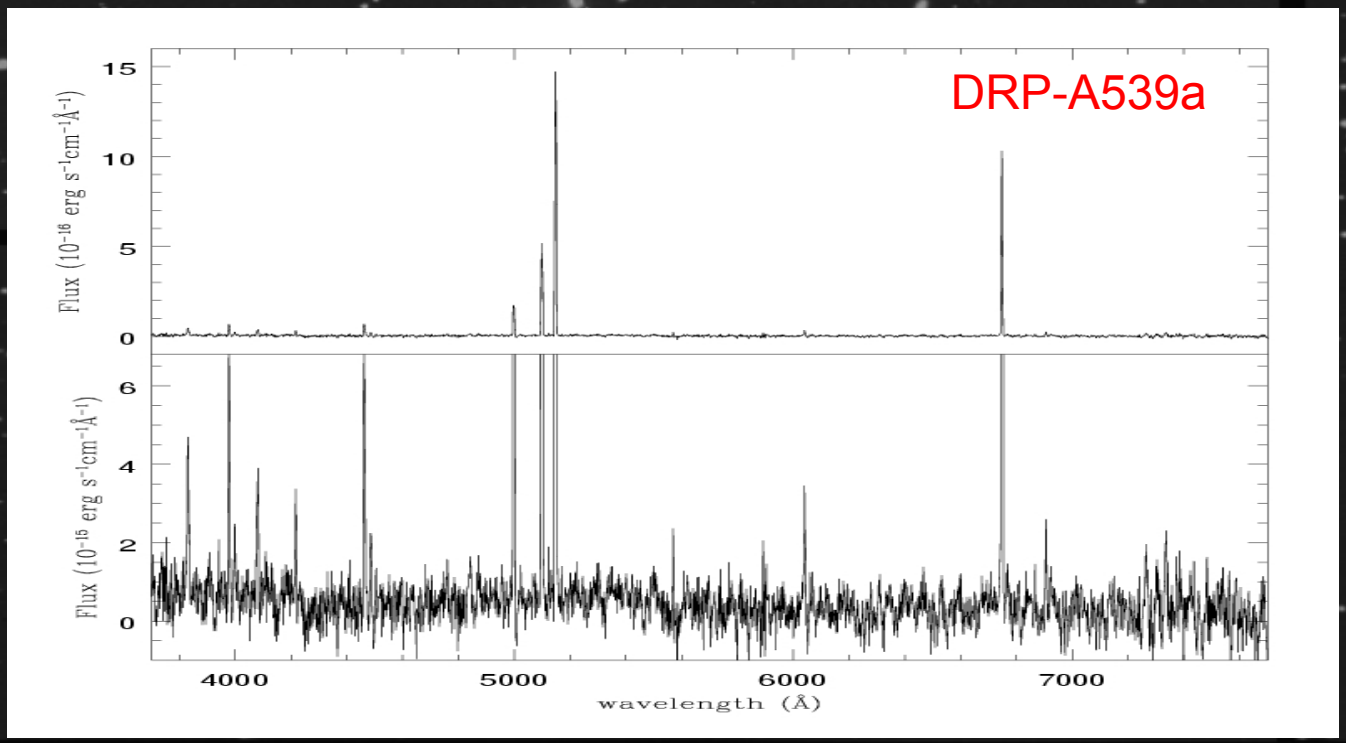
$C(H\beta)_{A634} = 0.47$

$C(H\beta)_{A539} = 0.27$

Flux Calibration

Despite to have Spectrophotometrical Standard Star for every night (which help us to the relative calibration of spectra) it was neccesary make the flux calibration using our previous Hα Image





First Sight

- Very Low Continuum Emission

- High Excitations lines

- High EW(Hα)

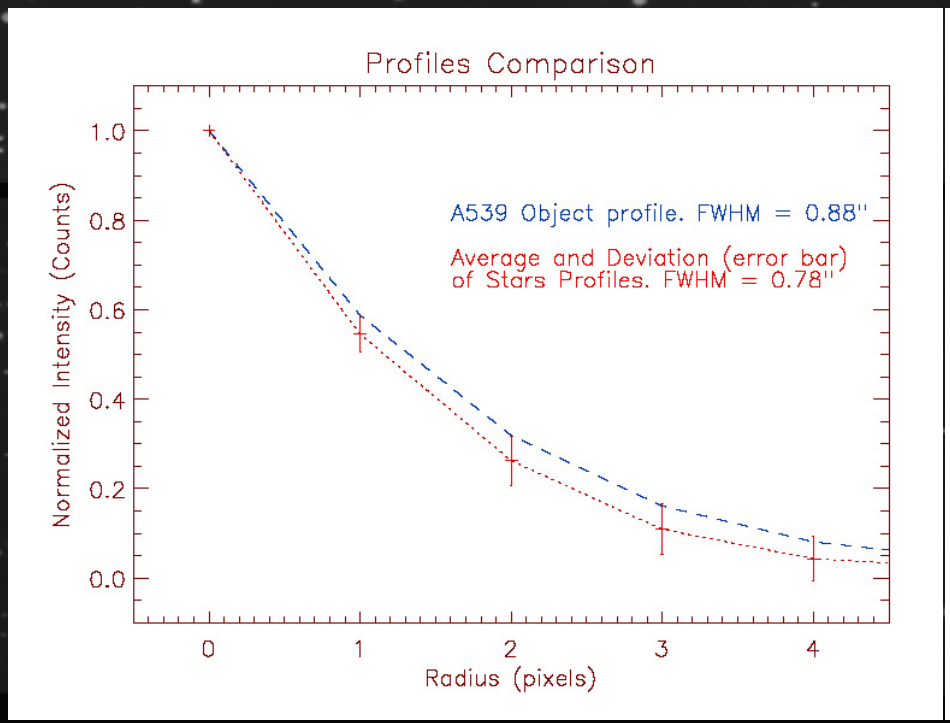
Basic Properties chart

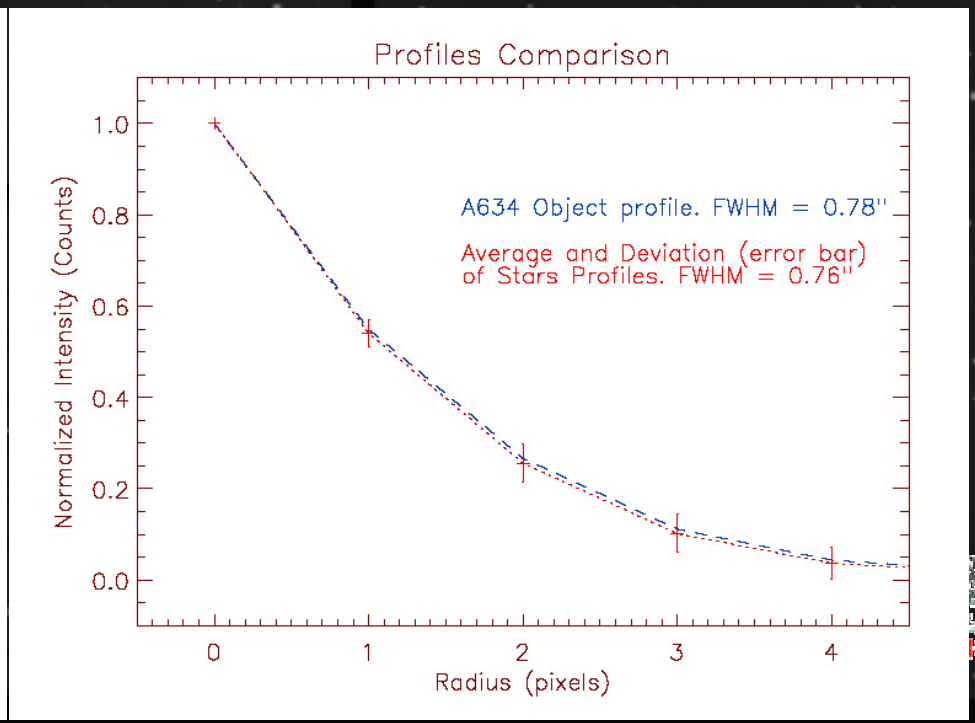
Abell 634 $v = 7945$ km s^{-1}
$\sigma_v = 339$ km s^{-1}

Abell 539 $v = 8514$ km s^{-1}
$\sigma_v = 629$ km s^{-1}

	DRP-A634a	DRP-A539a
RA	$08^h\ 13^m\ 55.6^s$	$+58^o\ 02'\ 32.4''$
DEC	$05^h\ 16^m\ 51.7^s$	$+06^o\ 19'\ 32.1''$
V_{rad} (km/s)	8450	8910
EW(Hα)	1273	570
M_B	-17.22	-17.00
M_V	-18.43	-16.83
r'	18.42	19.78
T_e([OIII]) (K)	16800	12800

Not resolved emission: ➔ Upper limit for Diameter ~ 400 Pc





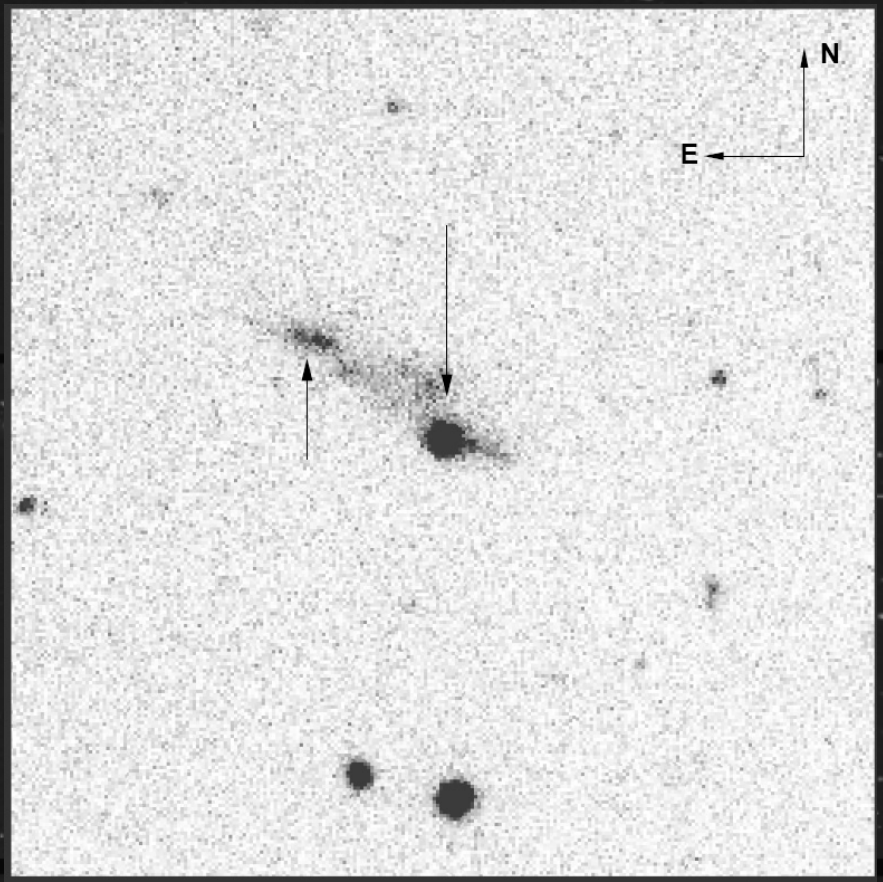
Chemical Abundances

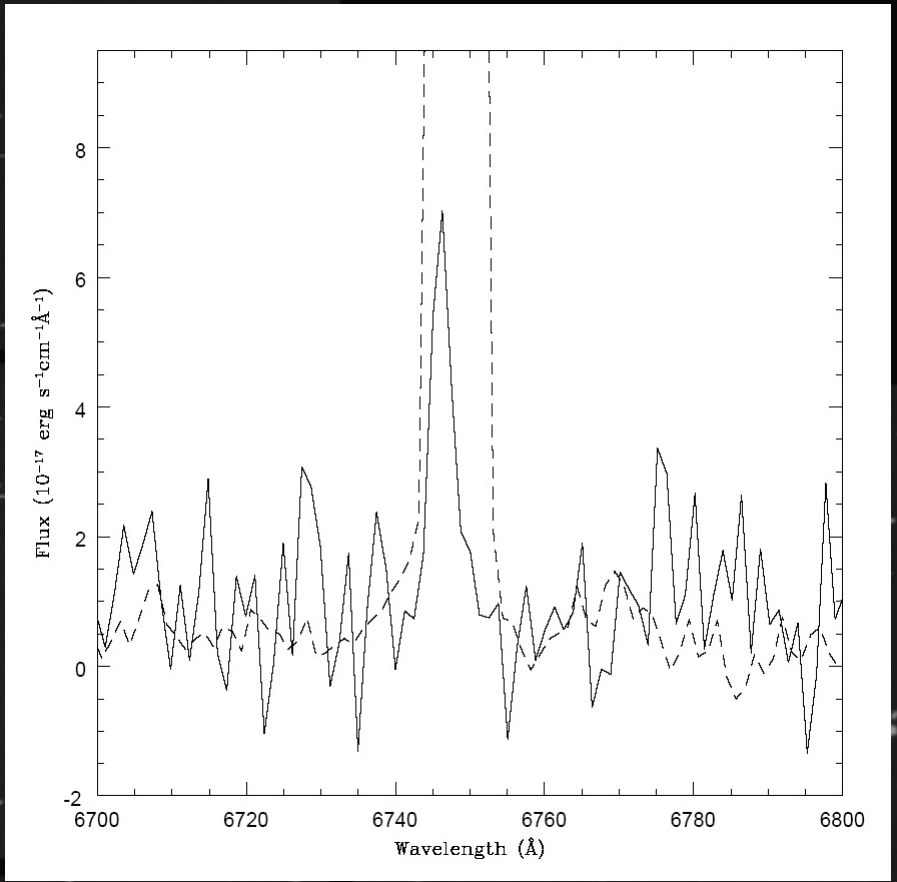
	DRP-A634a	DRP-A539a
$12+\log(O^+/H^+)$	6.75 ± 0.06	7.65 ± 0.14
$12+\log(O^{++}/H^+)$	7.83 ± 0.05	7.93 ± 0.14
$12+\log(O/H)$	7.87 ± 0.06	8.12 ± 0.14
$12+\log(S^+/H^+)$	4.90 ± 0.09	5.48 ± 0.12
$\log(N^+/O^+)$	-1.55 ± 0.08	-1.88 ± 0.10
$\log(Ne^{++}/O^{++})$	-0.9 ± 0.1	-0.6 ± 0.1
$\log(Ar^{++}/O^{++})$	-2.4 ± 0.1	---

Chemical Abundances

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$\log(Ar^{++}/O^{++})$	-2.4 ± 0.1	---

Low Surface Brightness Emission in DRP-A634a





Agreement in velocity