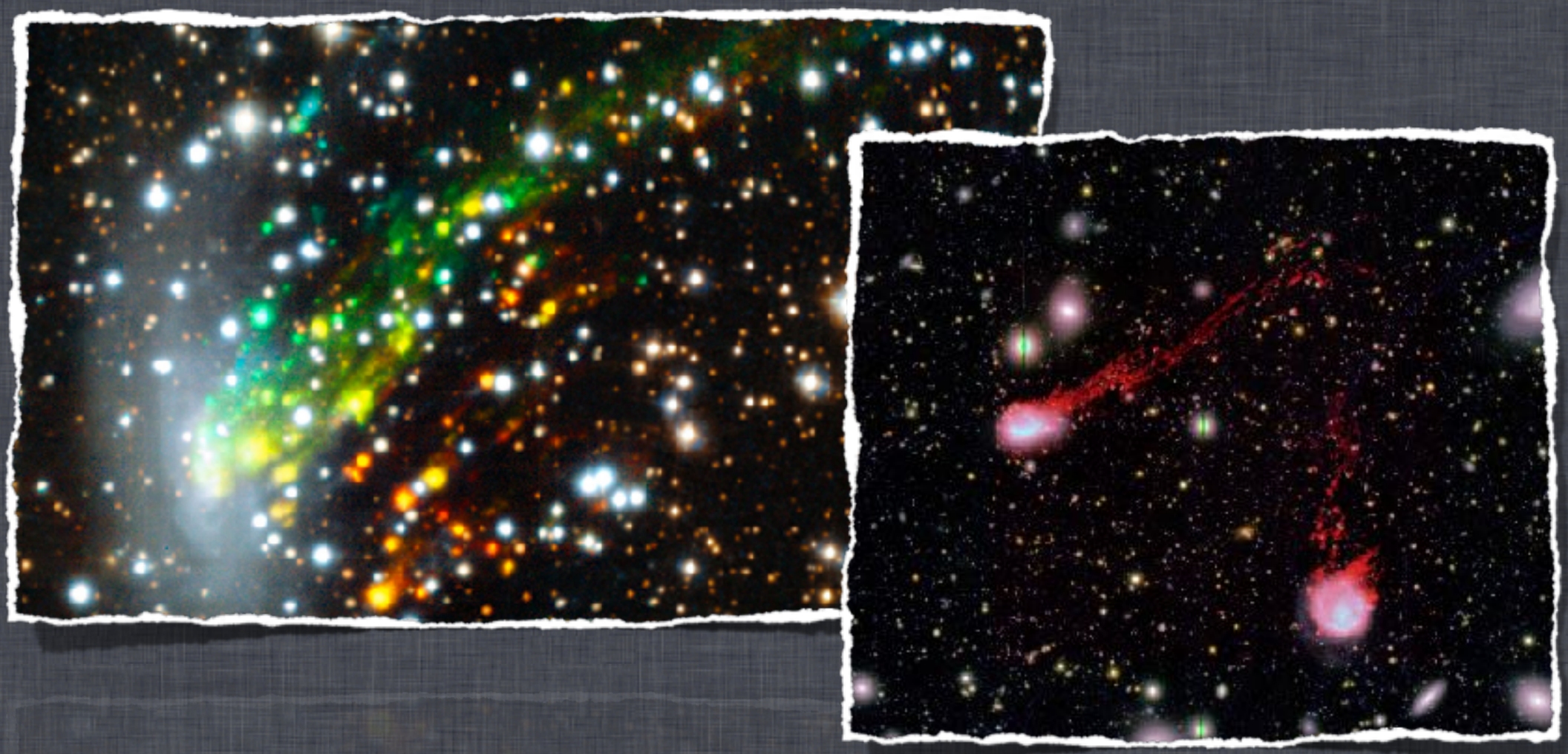
A spatially resolve view of gas stripping processes in nearby clusters

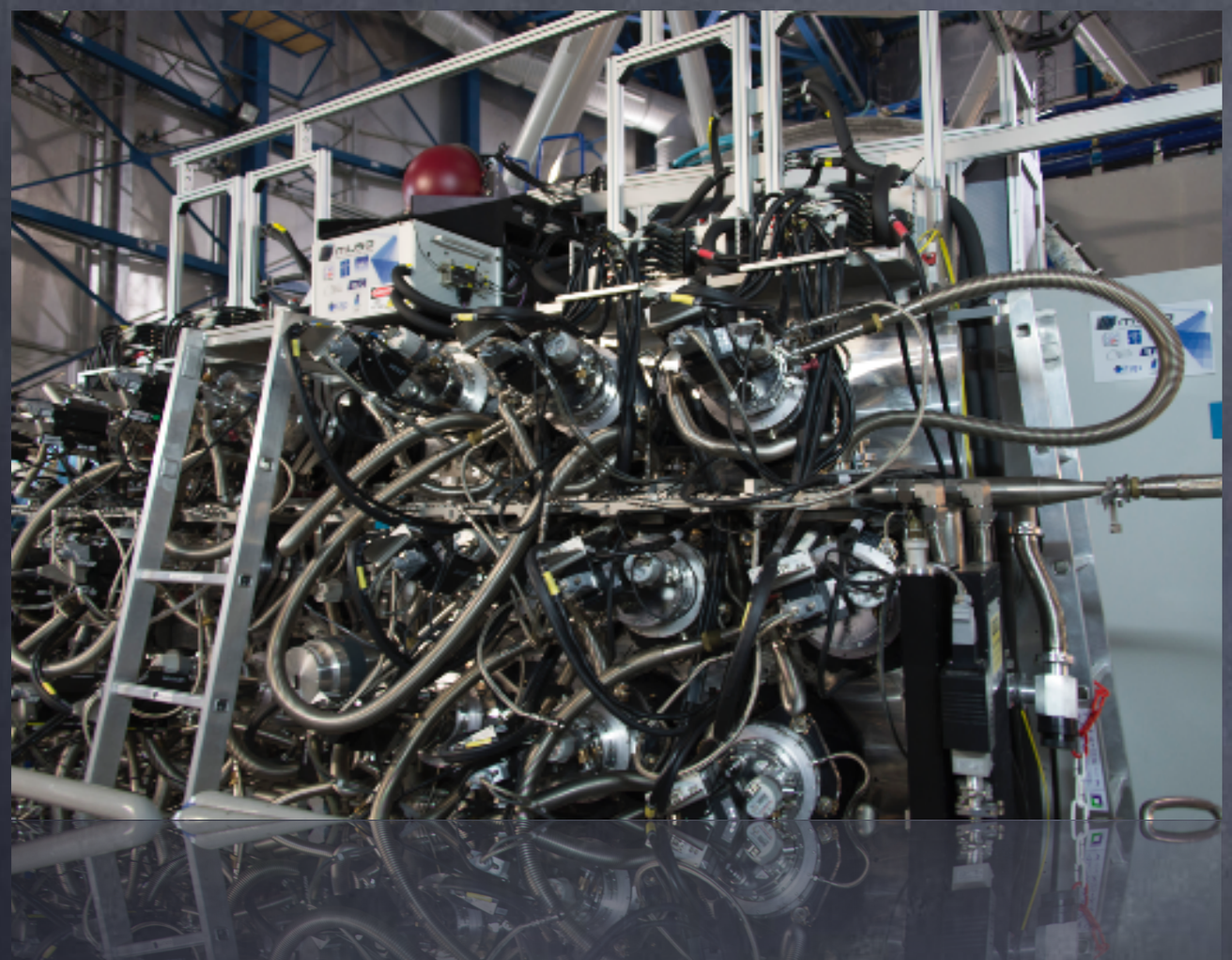


Matteo Fossati (MPE Garching)

& M.Fumagalli (Durham University), G.Gavazzi, G.Consolandi (Milano Bicocca, INAF Brera), A.Boselli (LAM, Marseille), M.Sun (University of Alabama), D. Wilman (MPE), M. Yagi (NAOJ)

Ringberg Workshop - 13 December 2017

MUSE: a game changer instrument @ VLT

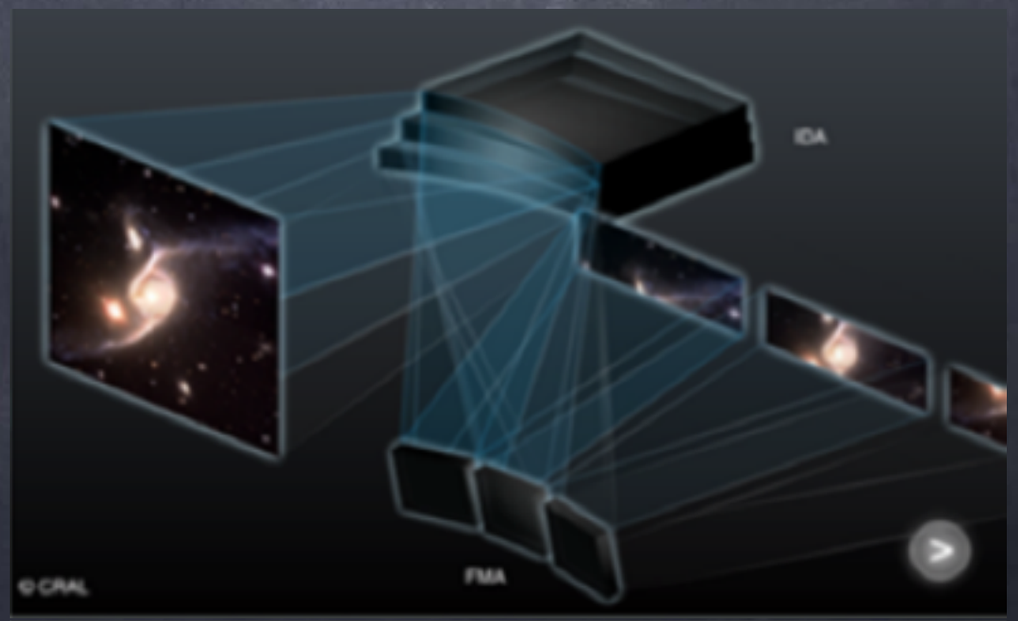


The Multi Unit Spectroscopic Explorer is a second generation instrument at VLT.

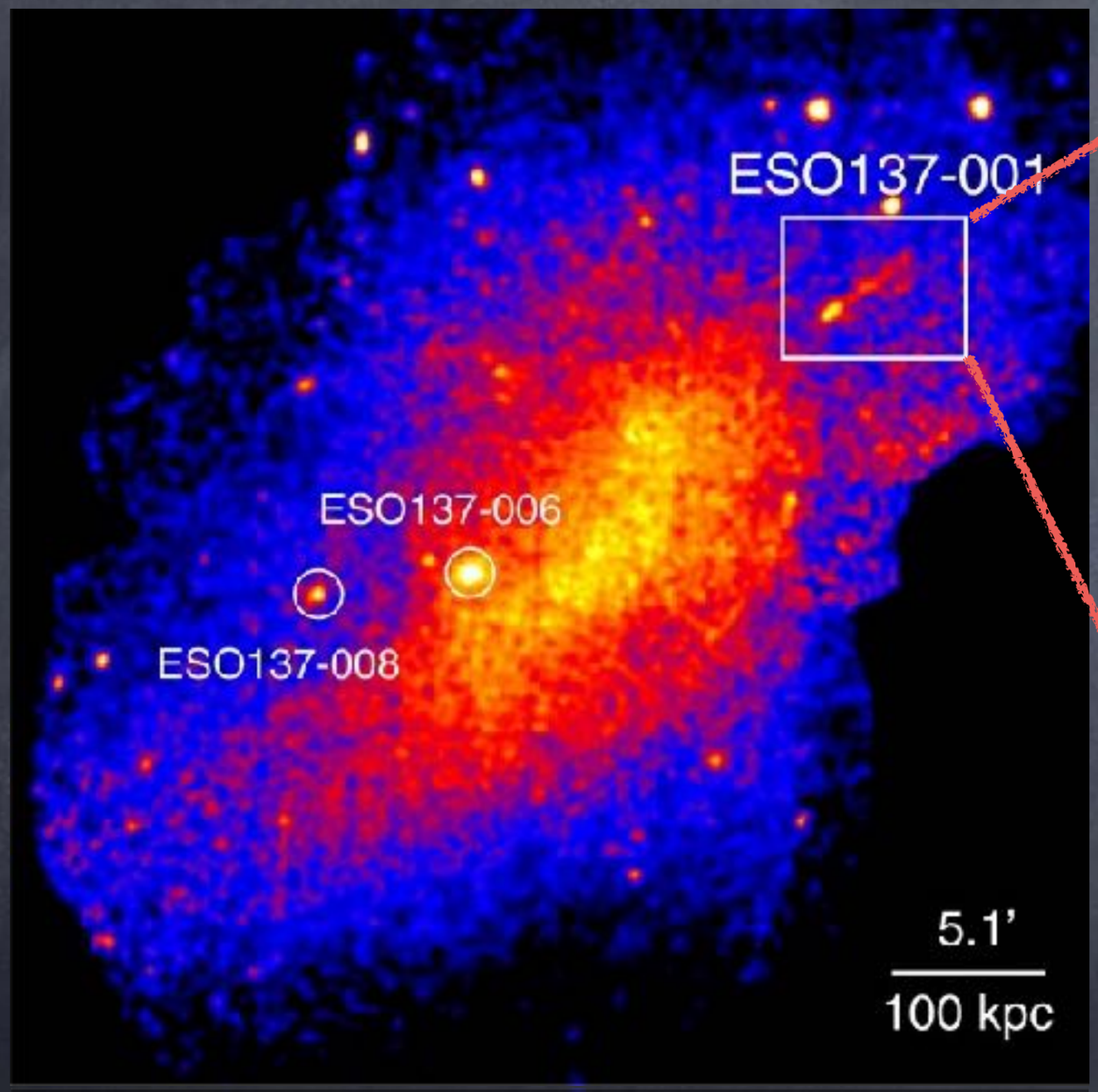
- Large FoV 1' x 1'
- High sensitivity (8.2 m telescope)
- Good spatial and spectral resolution (0.2" pixels and R=2500)
- Optical Wavelengths (4800-9000A)

Highly multiplexed instrument
24 spectrographs
24 detectors (4000x4000 pixels each)

90000 spectra per exposure
Needs efficient data processing



ESO137-001



Norma cluster (XMM Newton)

HST ACS+WFC3 (PI Sun)

log M* = 10 Msun

ESO137-001 with MUSE

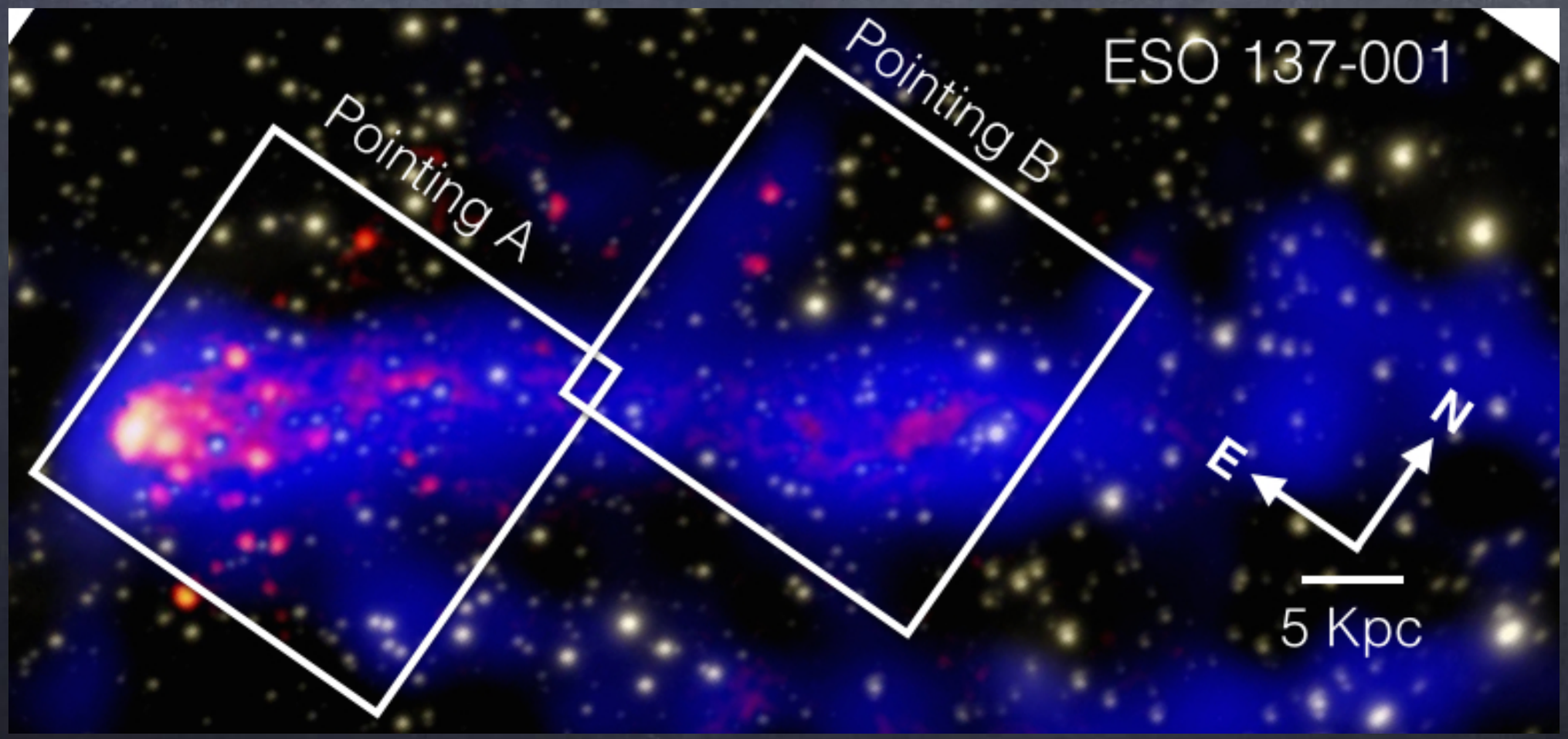
European Southern Observatory

eso1437 — Science Release

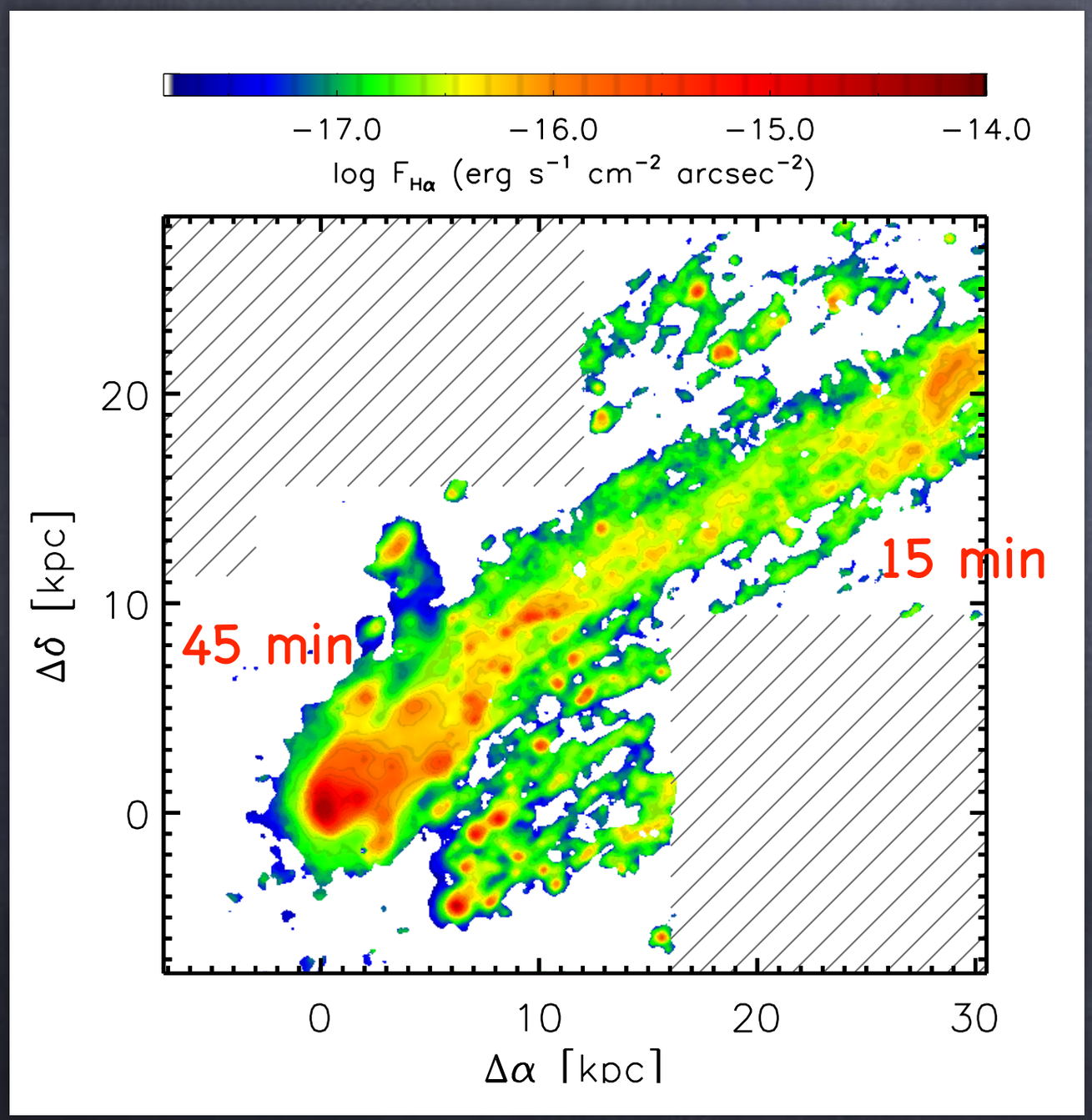
MUSE Reveals True Story Behind Galactic Crash

10 November 2014

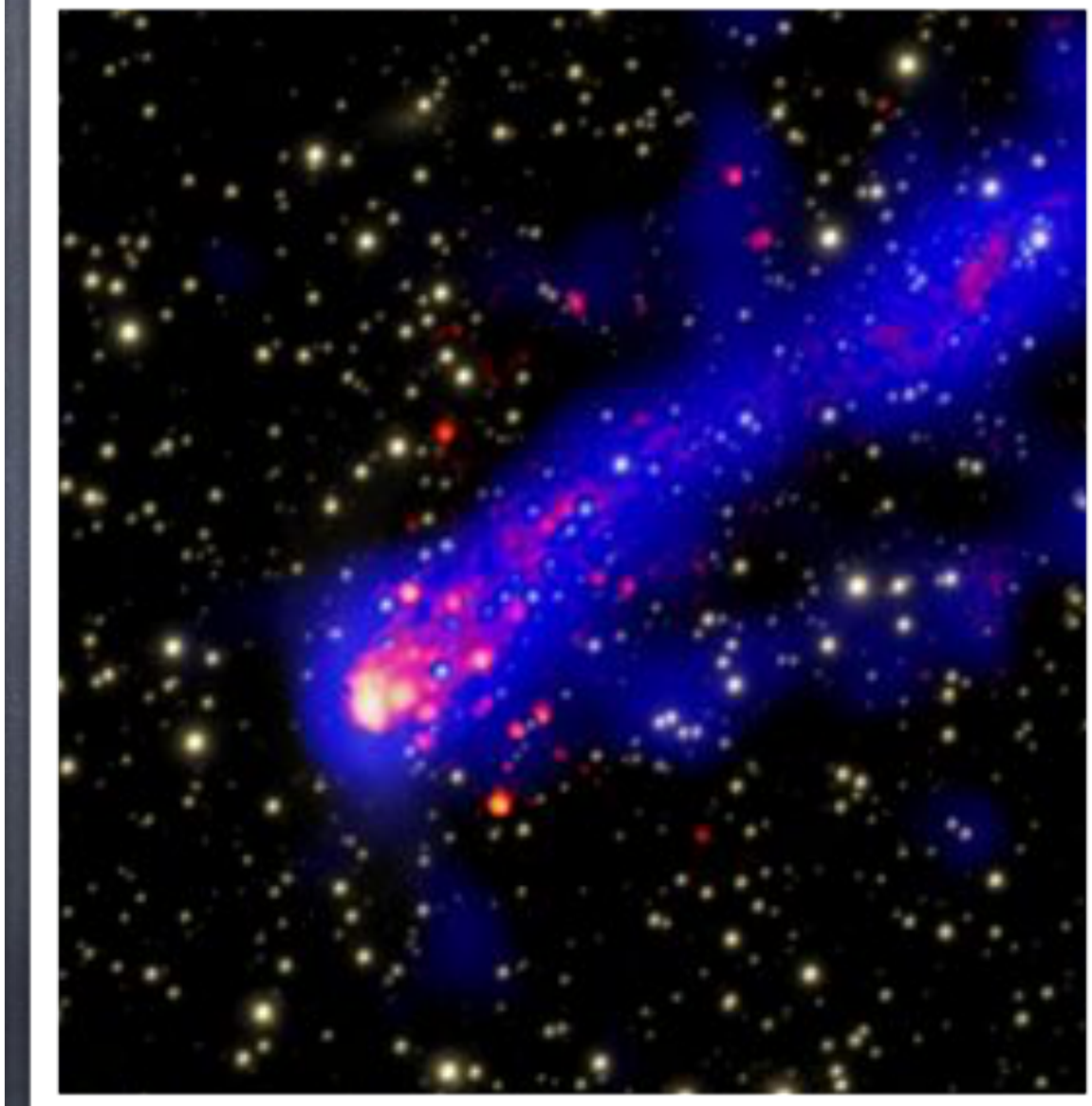
- The first SV program observed with MUSE
- The first MUSE paper (Fumagalli, MF et al. 2014)



ESO137-001 with MUSE

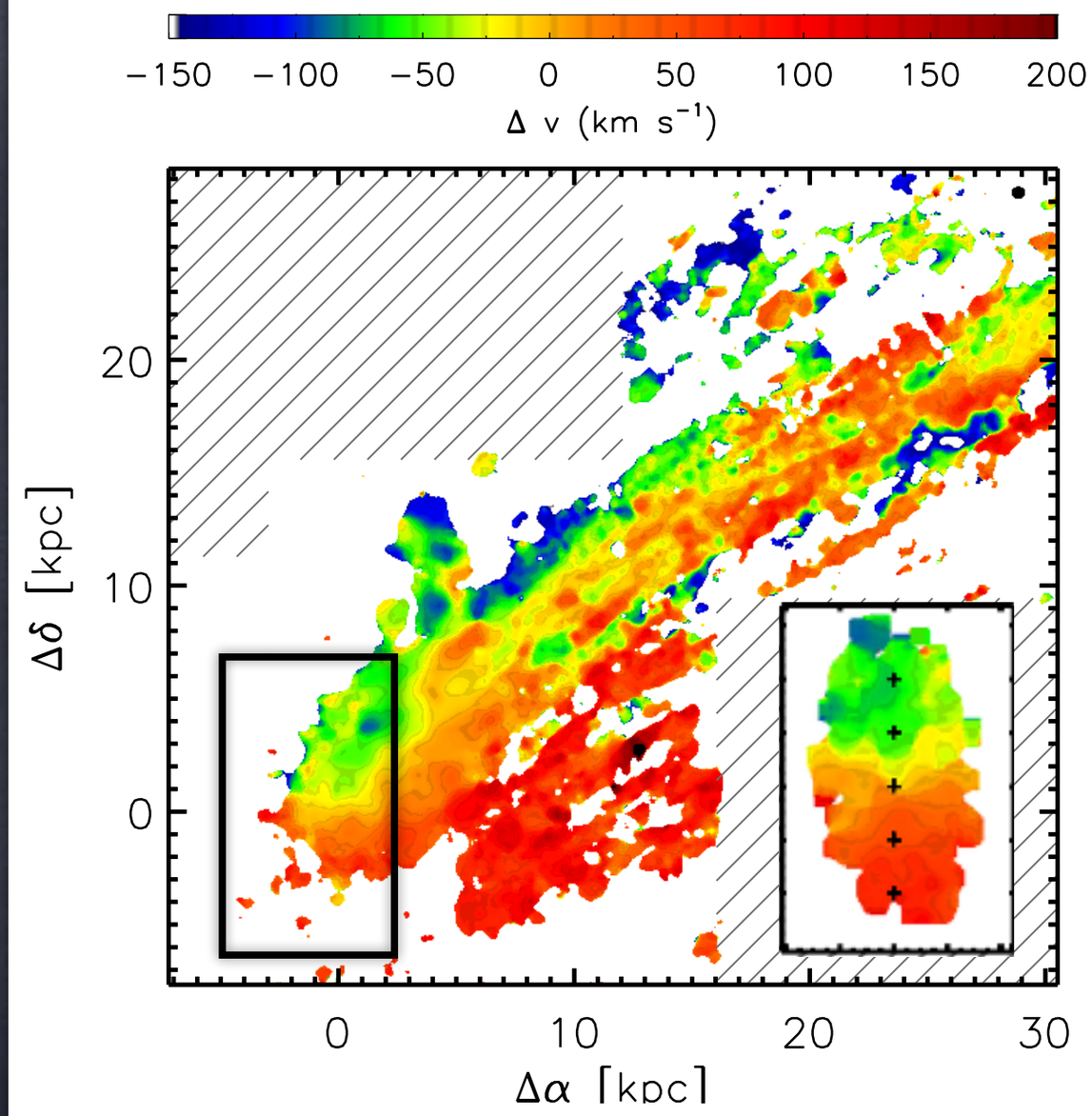


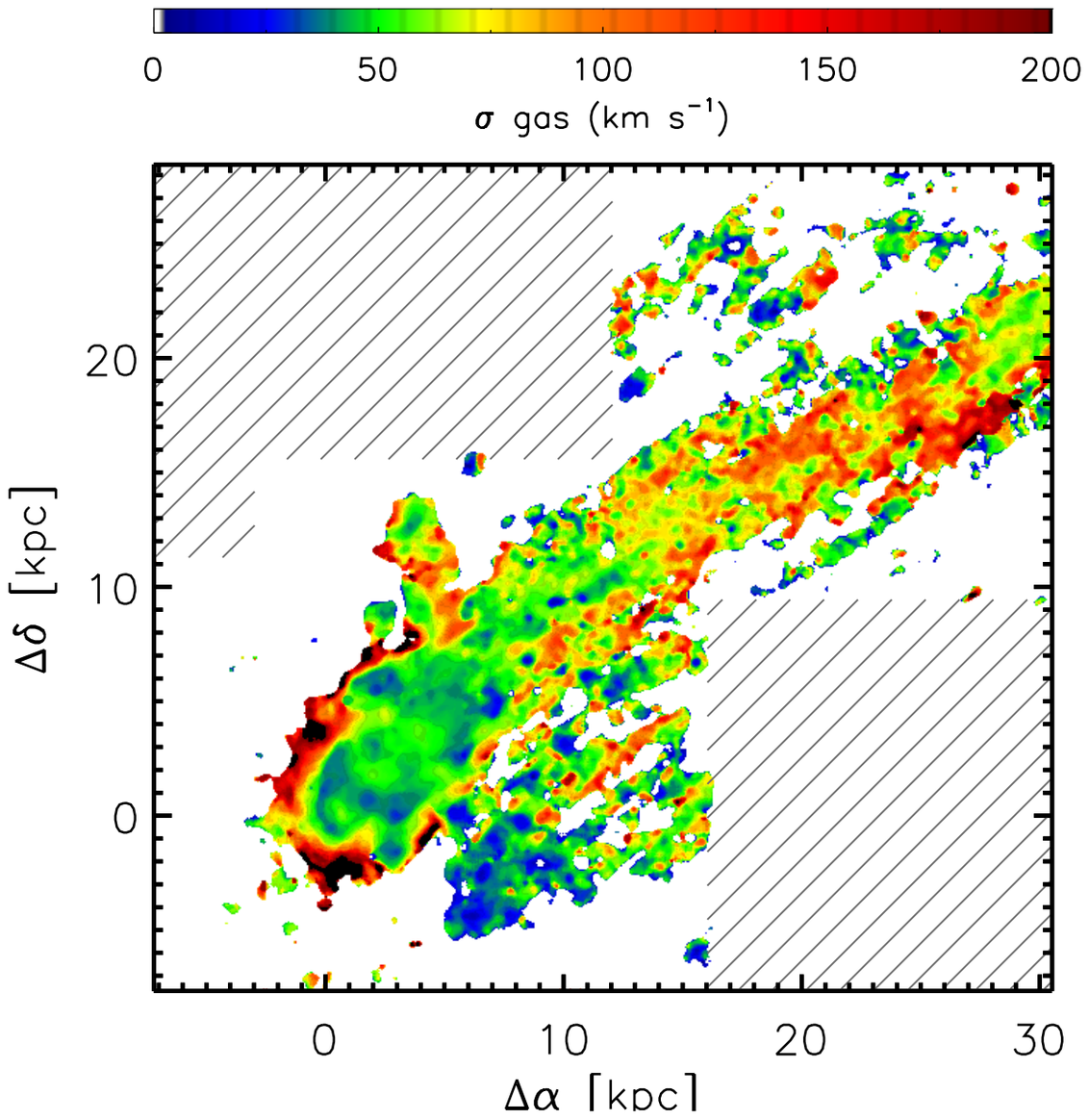
Fumagalli, MF et al. 2014 (updated fig.)



80m SOAR 4.1m telescope

ESO137-001 Hα Kinematics

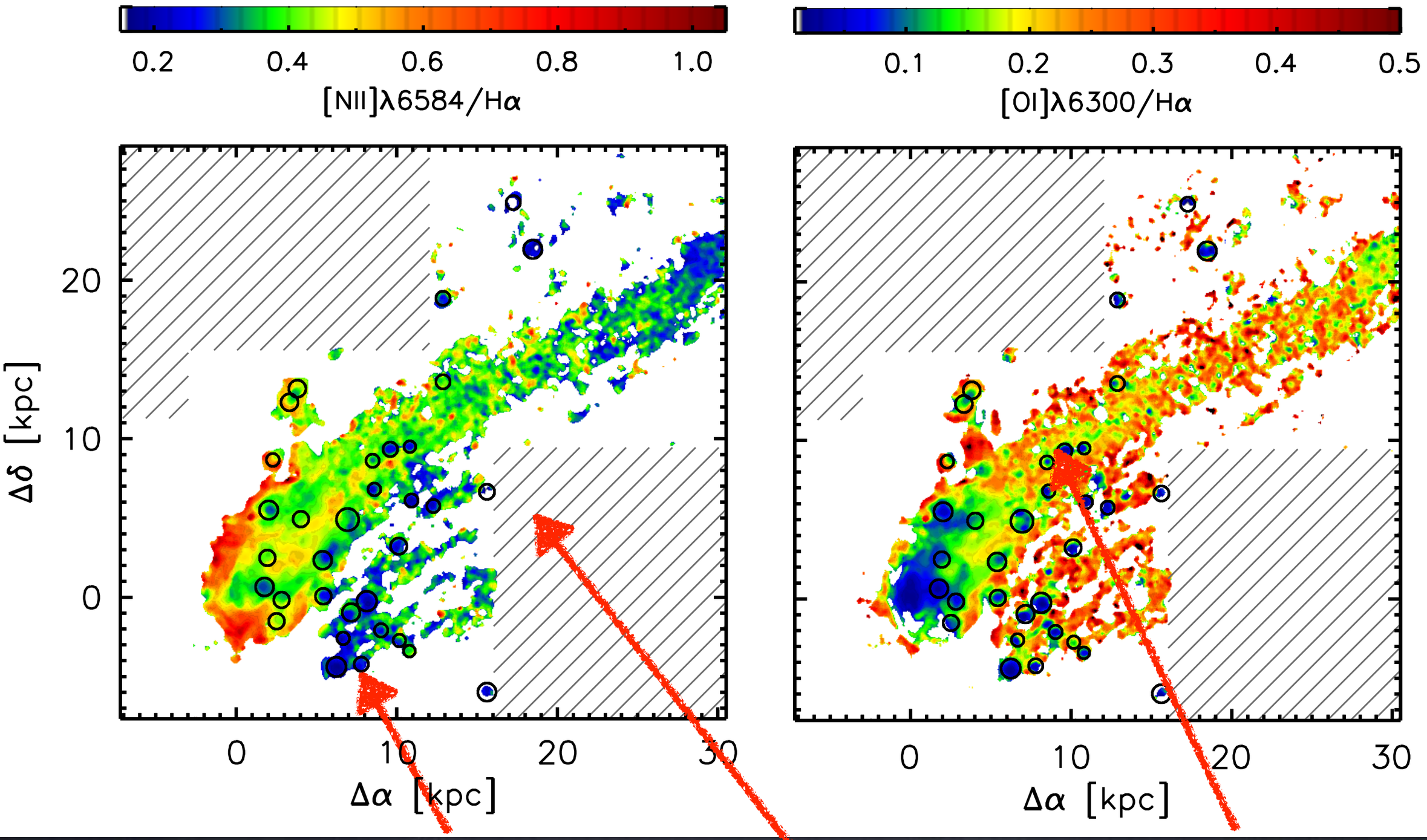




Fumagalli, MF et al. 2014 (updated fig.)

- Gaseous disk is significantly truncated by RPS
- Ordered velocity field in the tail (as well as in the galactic disc)
  - Proof of high velocity motion in the cluster potential
  - Radial orbit and Vinfall ~ 3000km/s (Jachym et al. 2014)

ESO137-001 Line ratios



Metallicity gradient

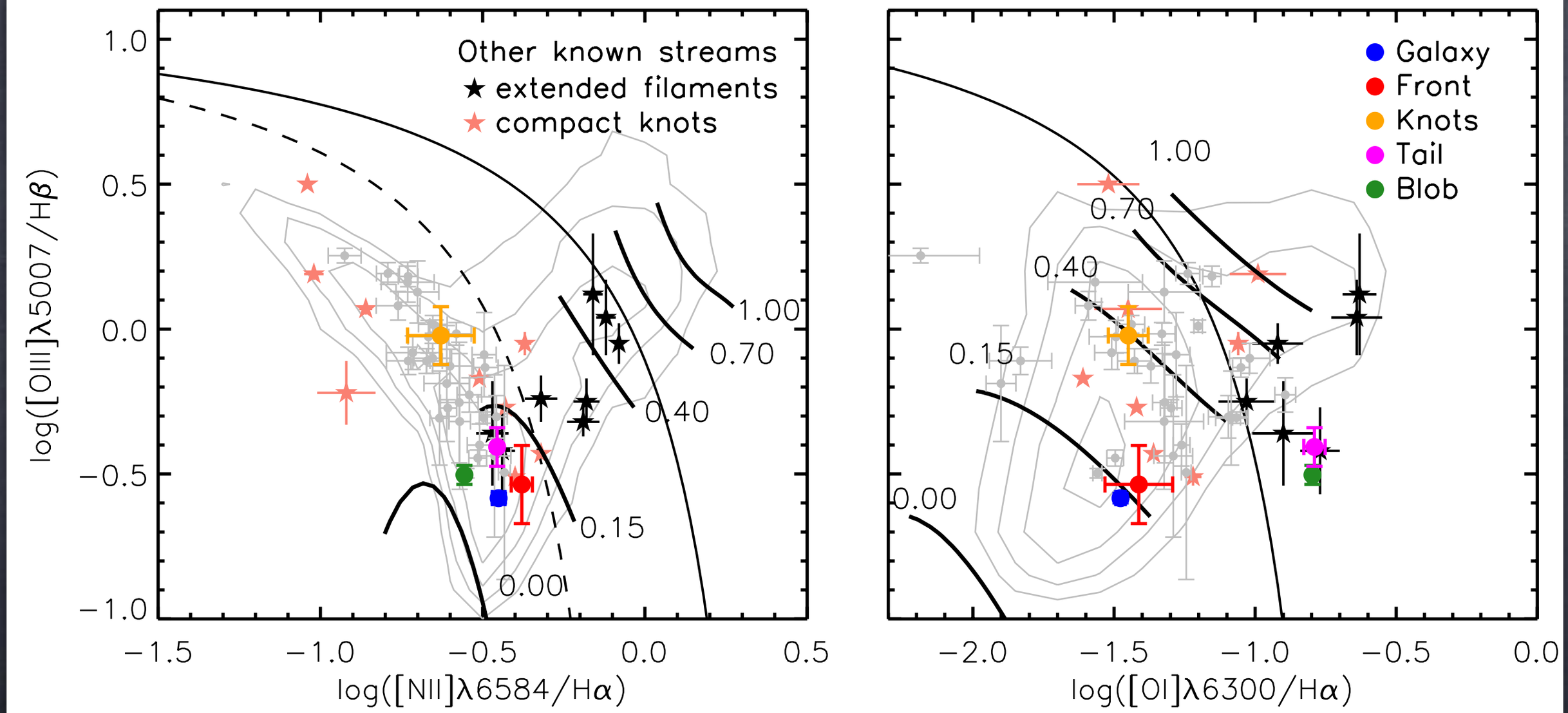
Shocks in the tail

Several (20) HII regions in the tail

MF, Fumagalli et al. 2016

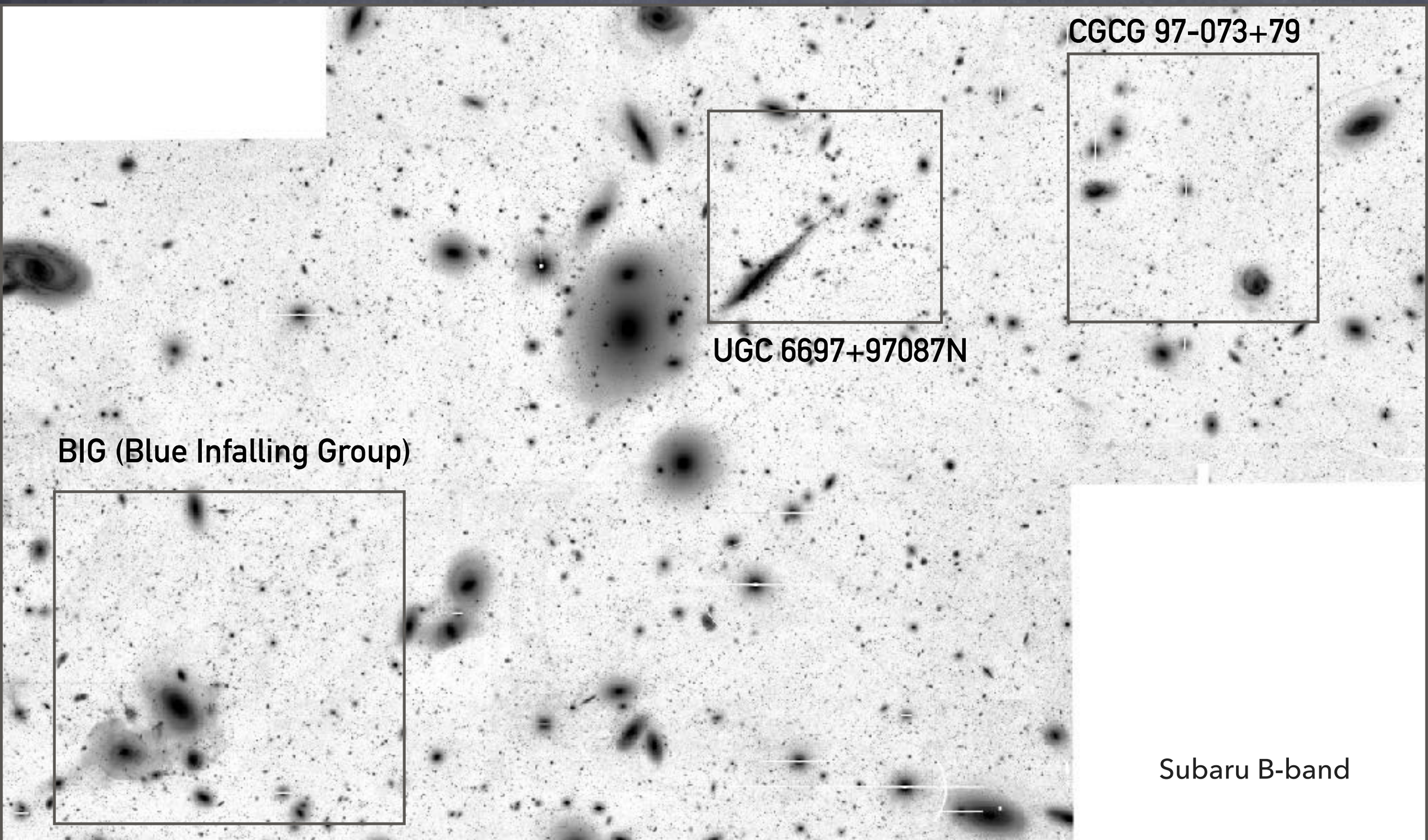
ESO137-001 Diagnostics

MF, Fumagalli et al. 2016

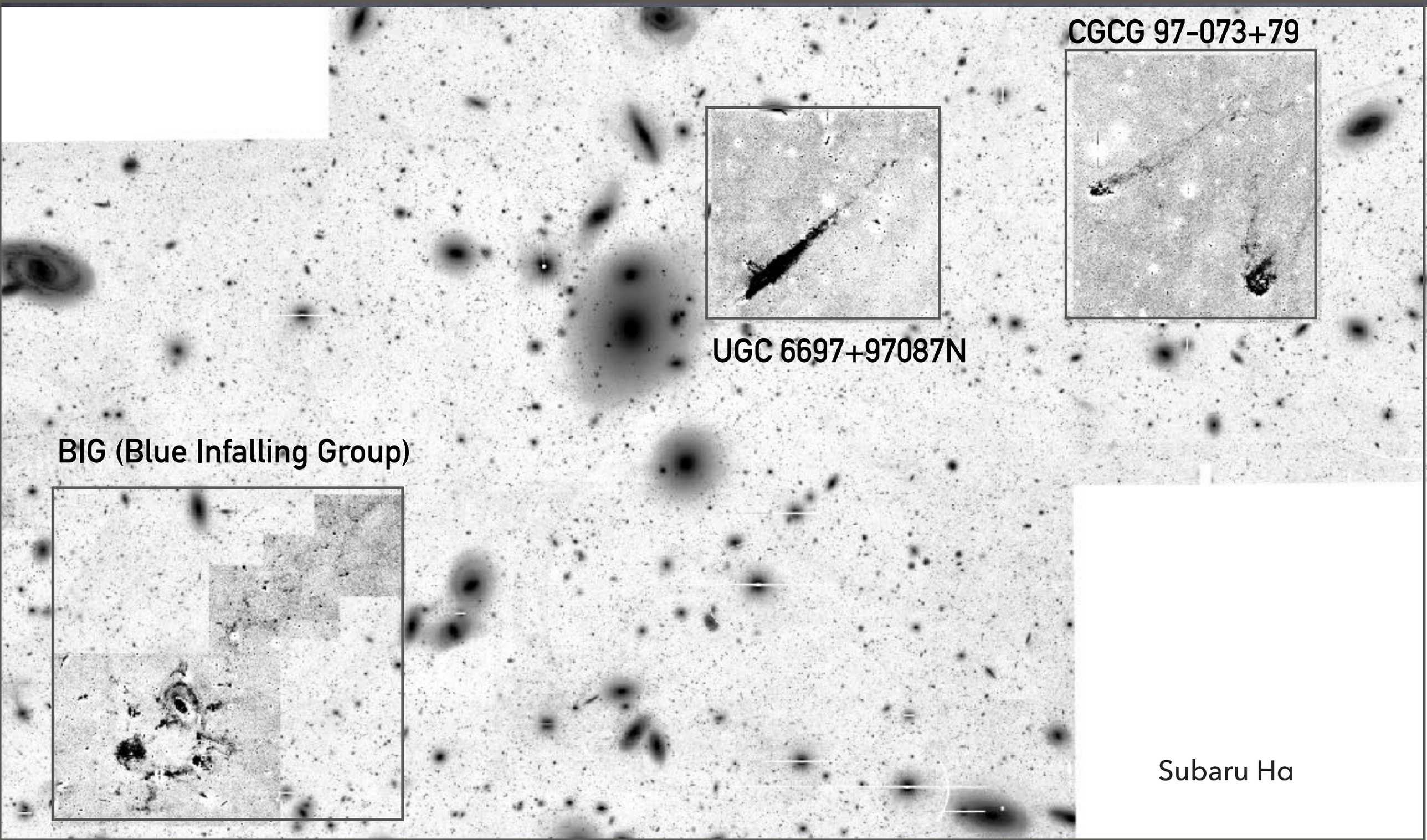


BPT is a powerful diagnostic, can we fill these plots with several RPS galaxies?
Investigate the connection between stripping conditions and gas physics

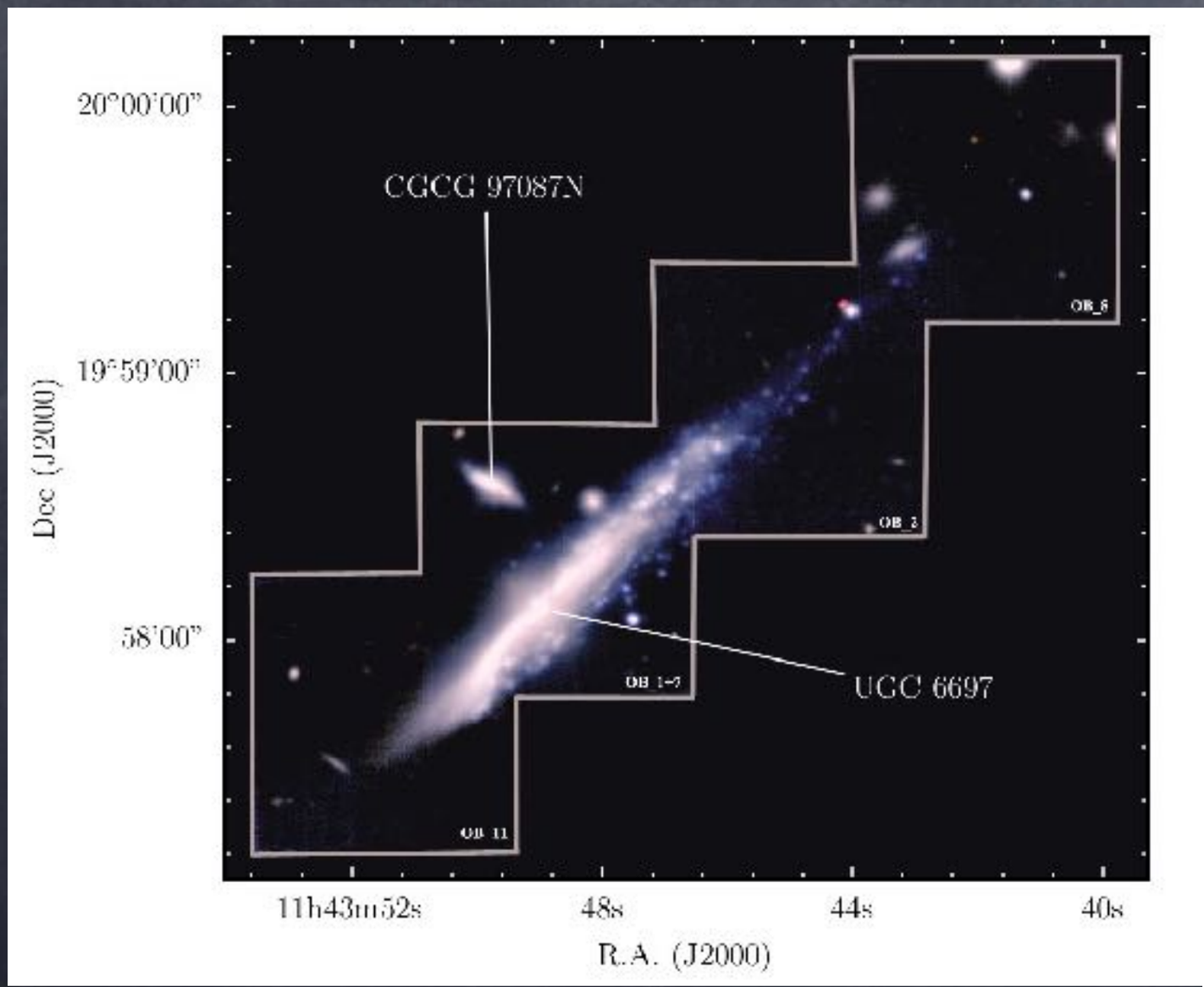
MUSE sneaks a peek in A1367

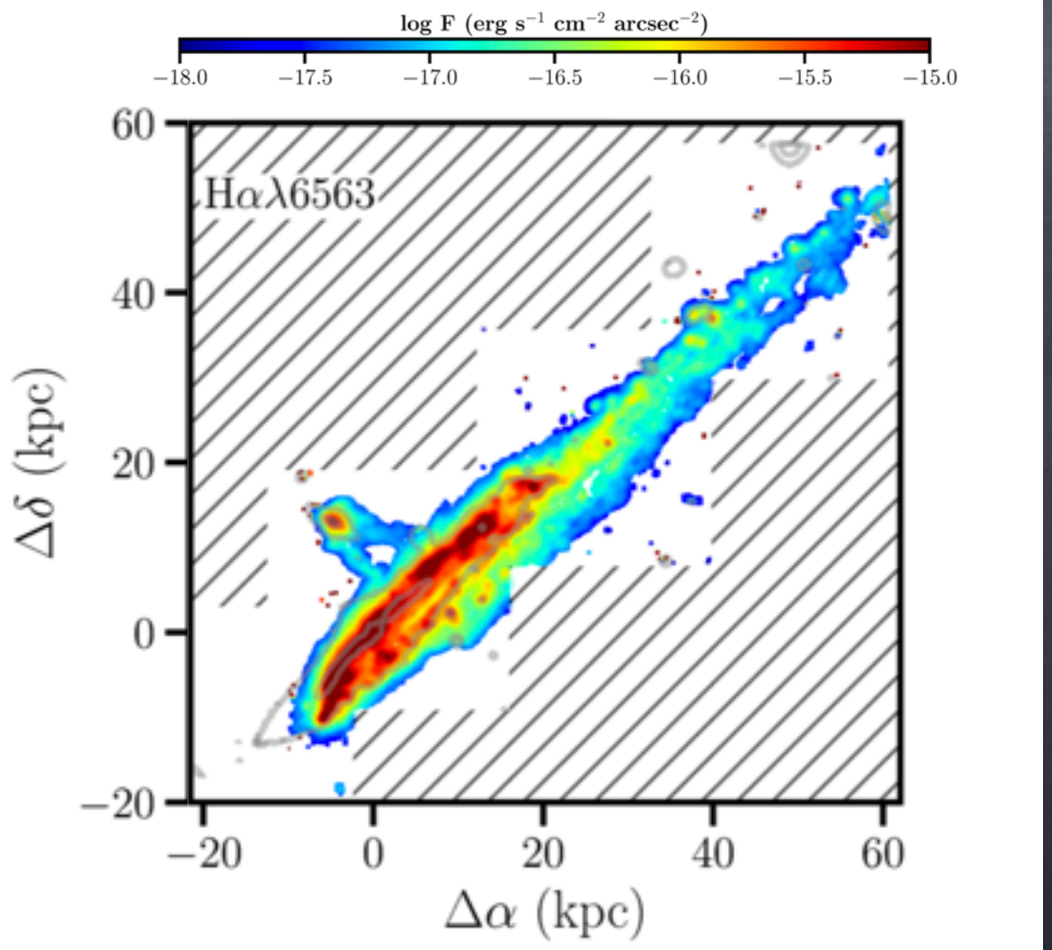


MUSE sneaks a peek in A1367



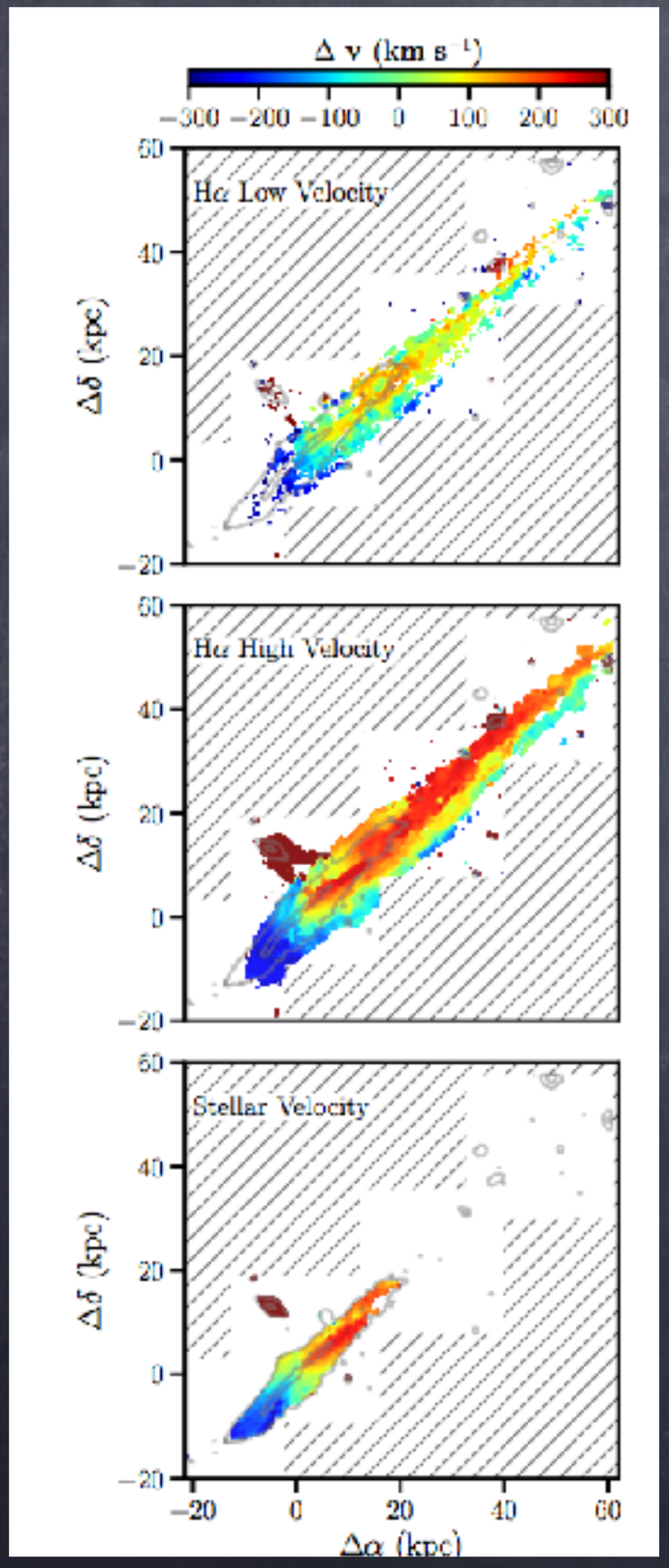
UGC6697 - an edge-on stripping case

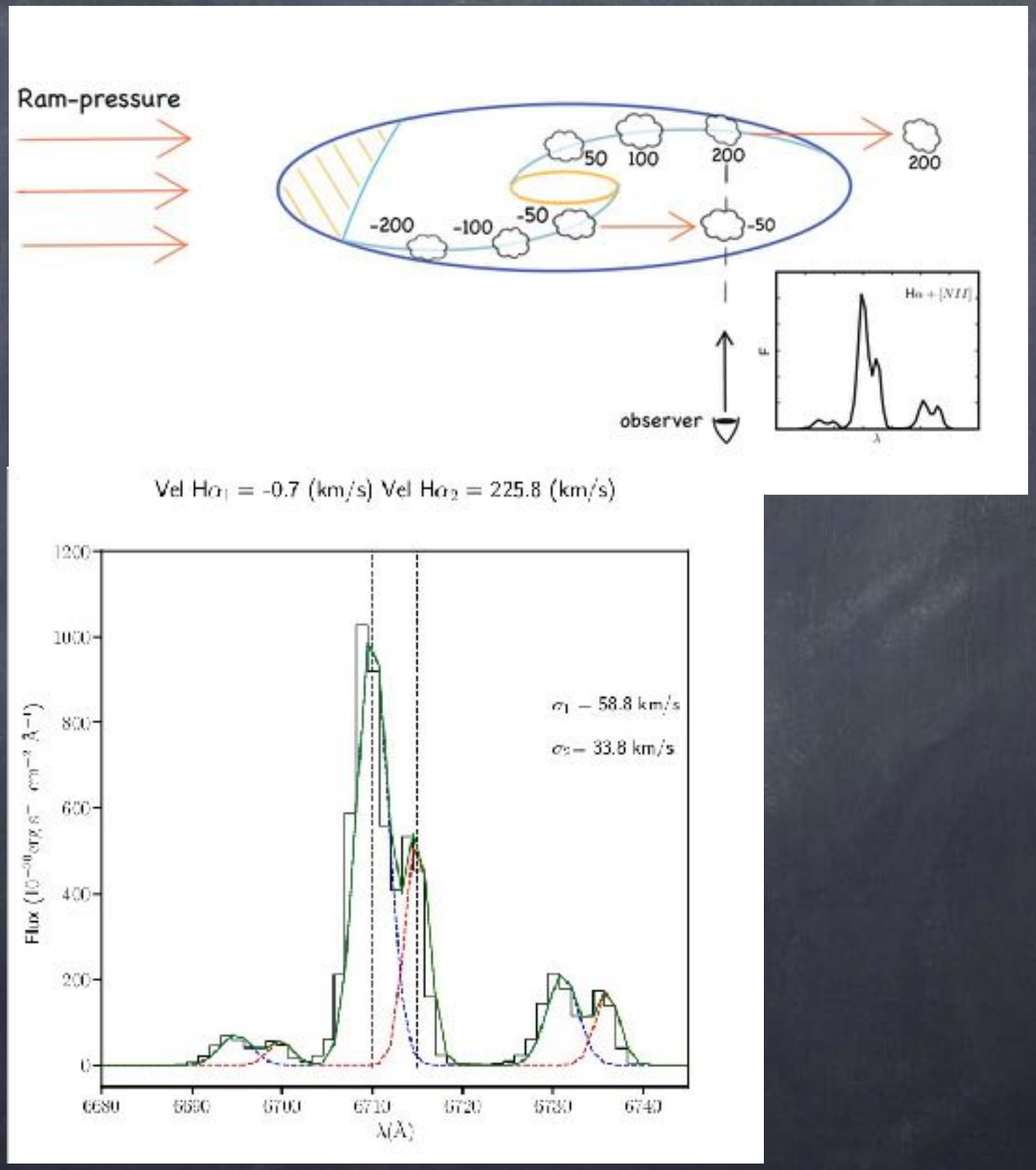




Consolandi et al. 2017

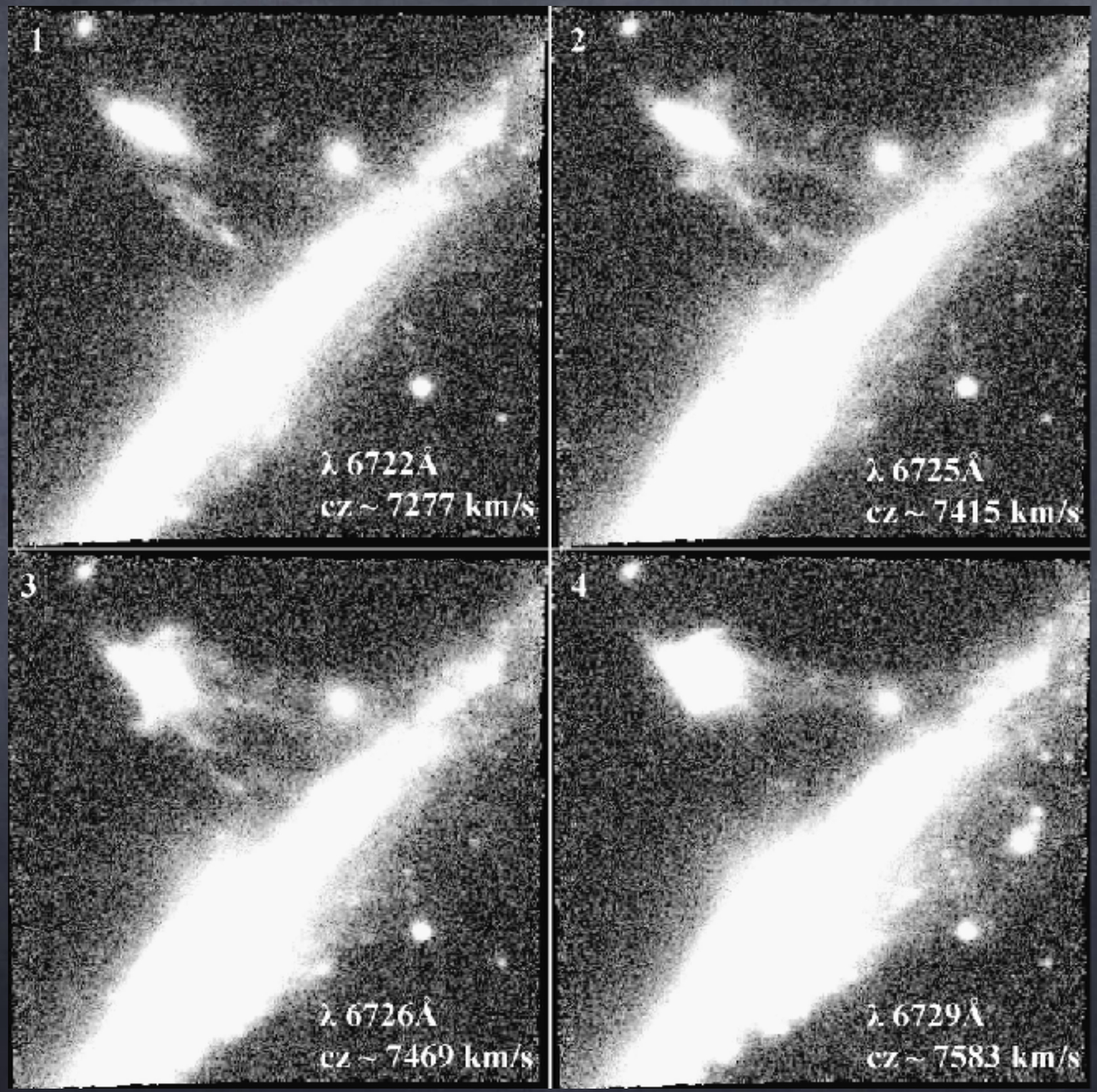
UGC6697 - complex kinematics



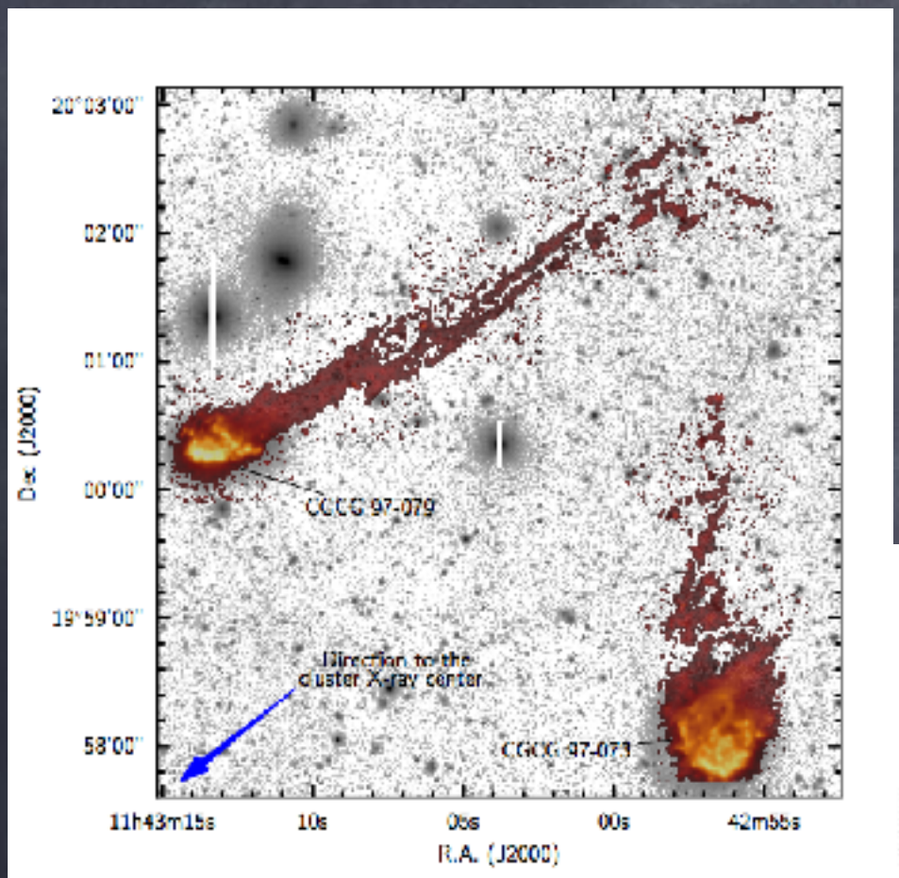


Consolandi et al. 2017

UGC6697 - Companion

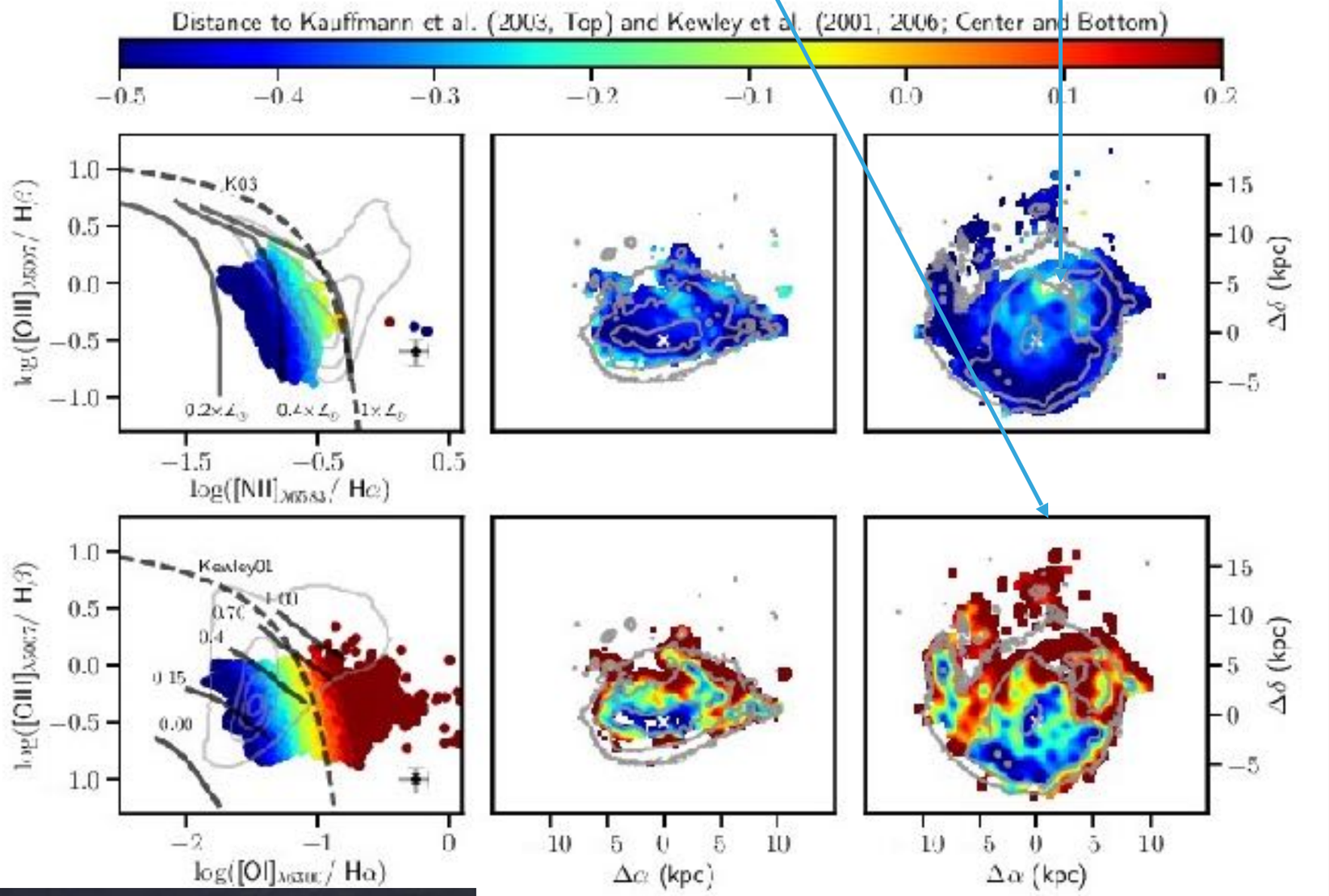


CGCG 97-073 / 97-079



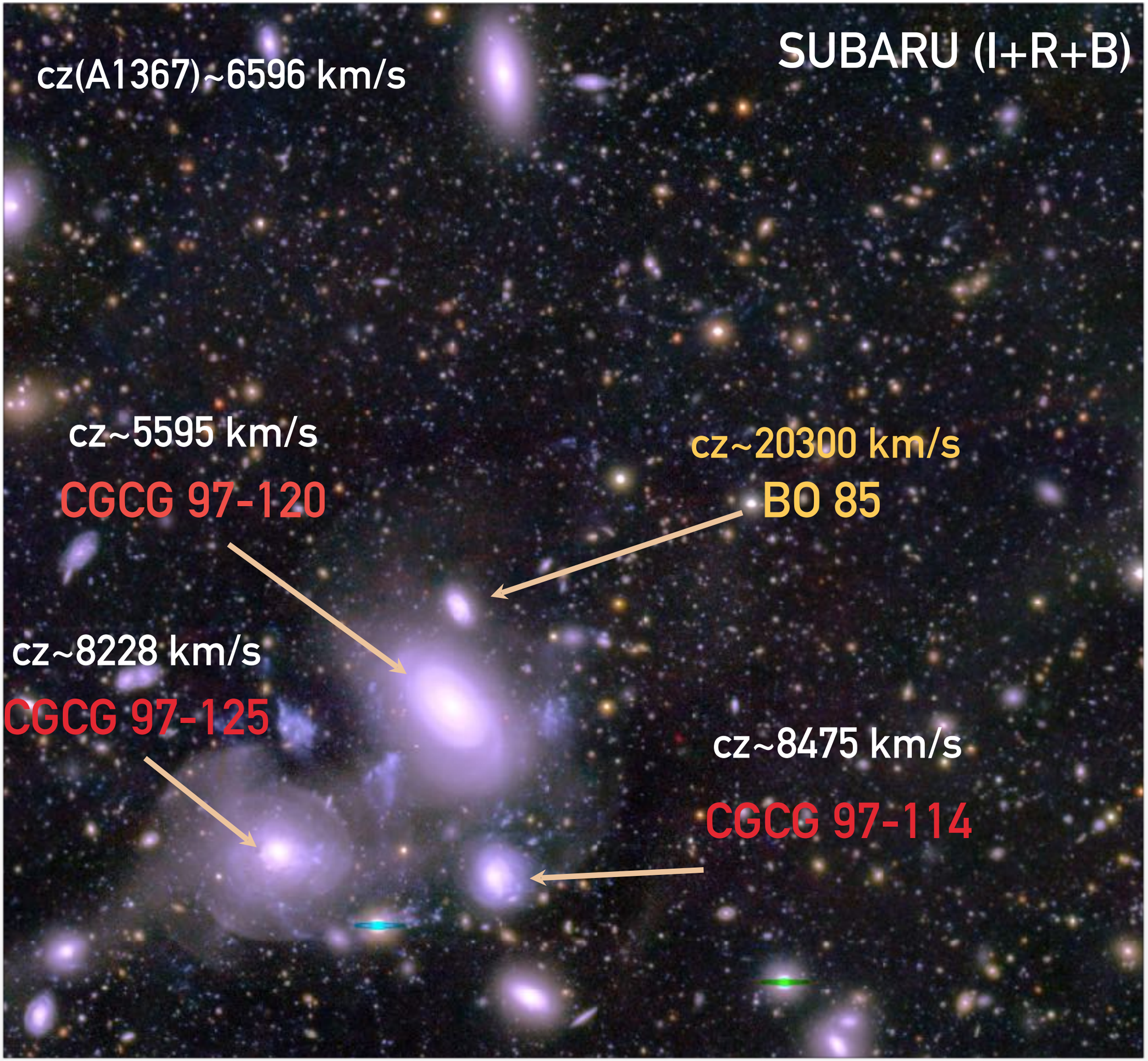
shocks

low metallicity



Blue Infalling Group

Sakai+02
Cortese+06
Fossati+ in prep



Blue Infalling Group

Sakai+02
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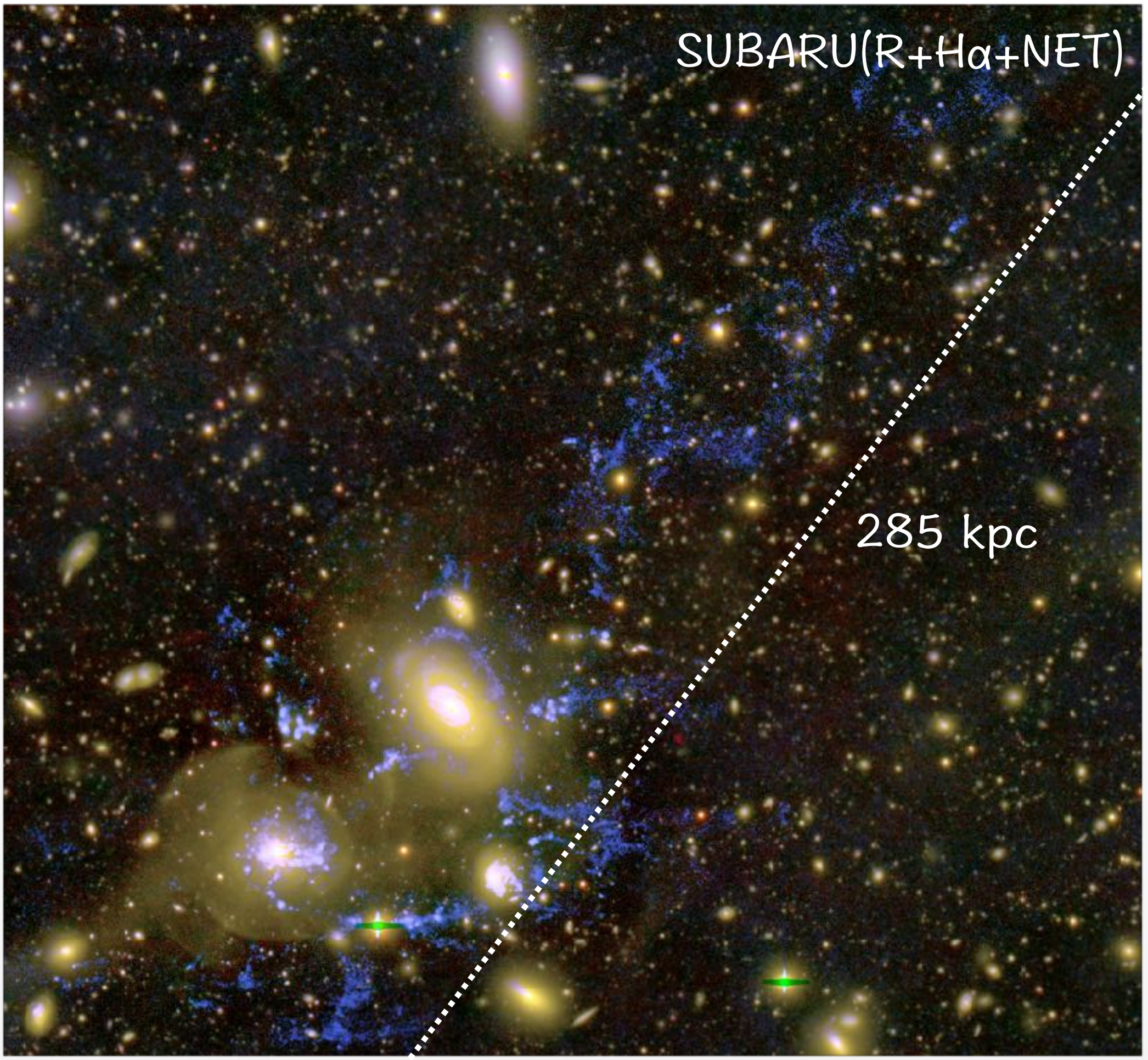
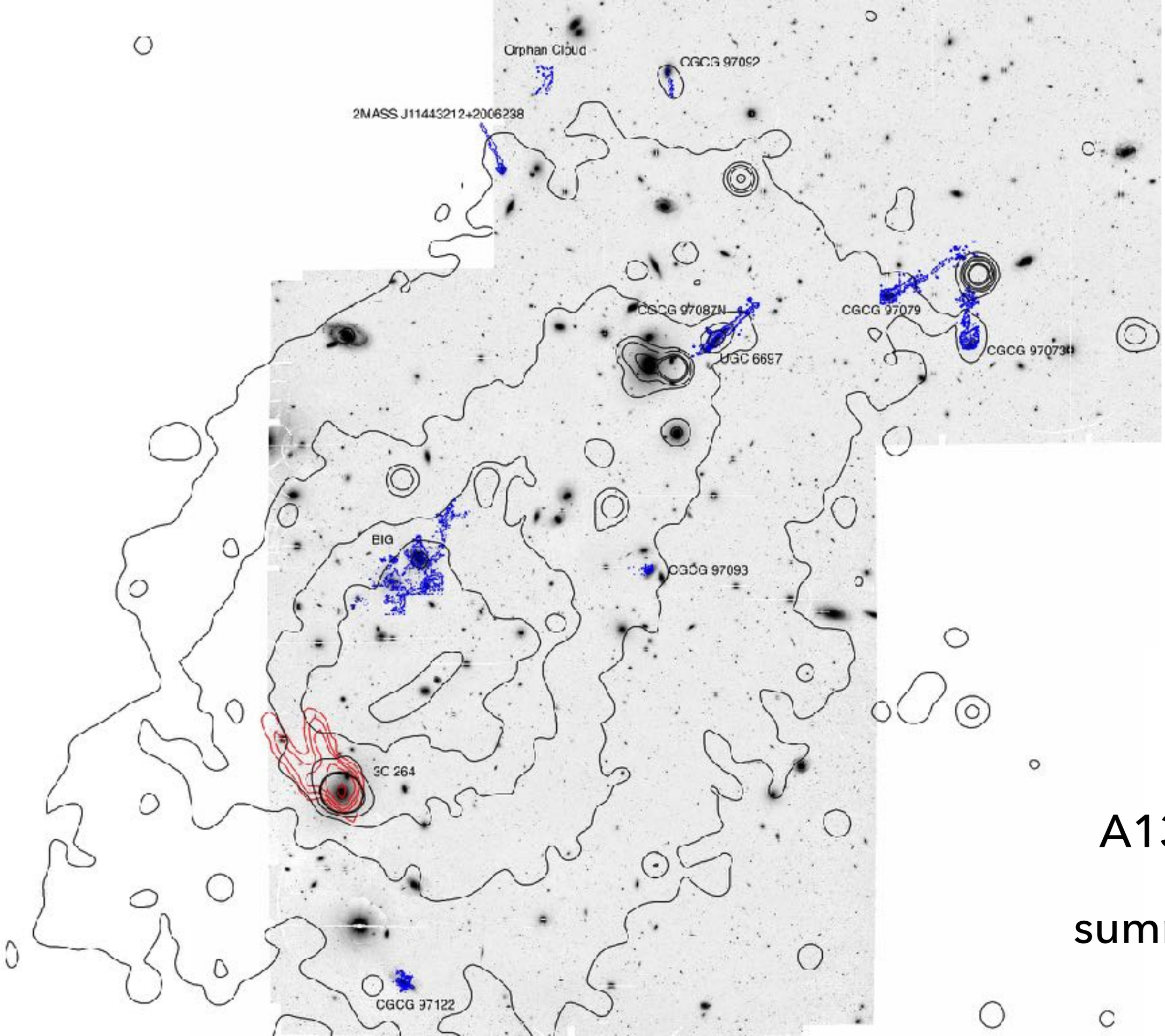
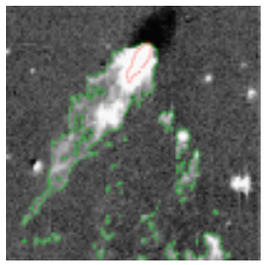




A1367

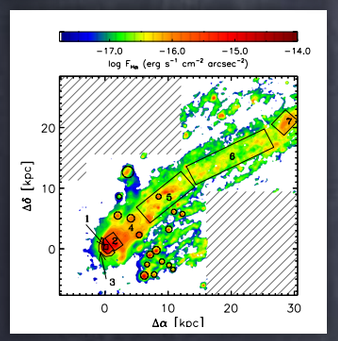
summary

Conclusions

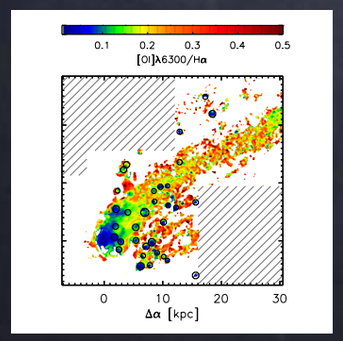


Signatures of gas stripping phenomena are ubiquitous in local massive clusters (e.g. detection of ionised gas tails, truncated radial profiles, short quenching times).

MUSE has a terrific potential for investigating ram-pressure stripping events in the local Universe.



ESO137-001 is falling fast in the core of the Norma Cluster. The velocity field is ordered with hints of high turbulence at larger distances.



There is a significant energy input in the ionised stripped gas from shocks and turbulence.