MOIRCS Narrow-Band Survey: Panoramic Hα Mapping of a z=0.8 Cluster
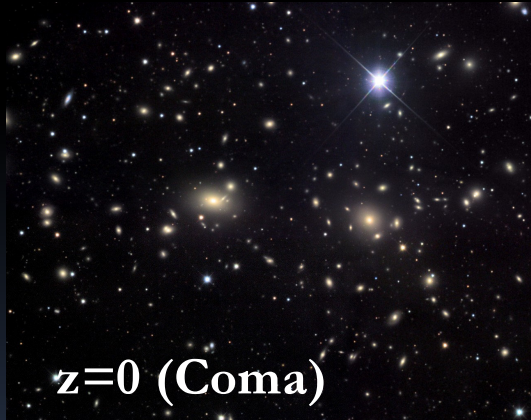
Yusei Koyama (Univ. of Tokyo)

Tadayuki Kodama (NAOJ), Kazuhiro Shimasaku (Univ. of Tokyo)

Masao Hayashi (Univ. of Tokyo), Sadanori Okamura (Univ. of Tokyo)

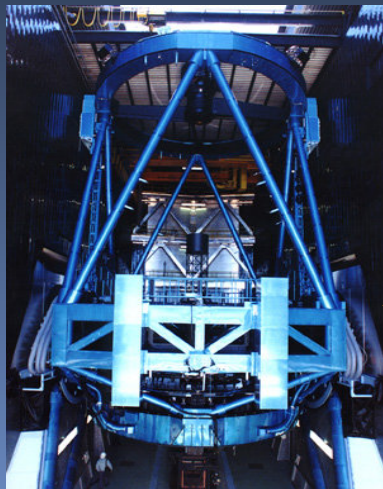Ichi Tanaka (NAOJ), Chihiro Tokoku (Tohoku Univ.)

Subaru narrow-band survey for distant clusters

Unbiased survey for the SF activity

in the two distant clusters at z=0.81 and z=1.46
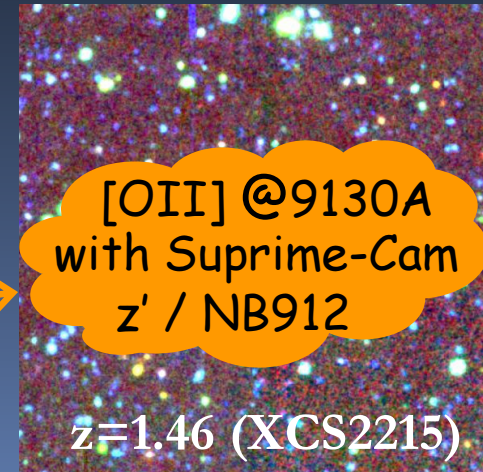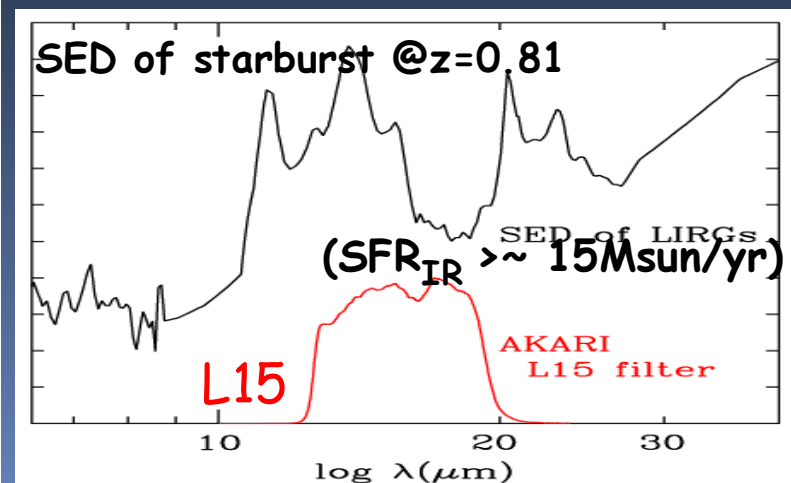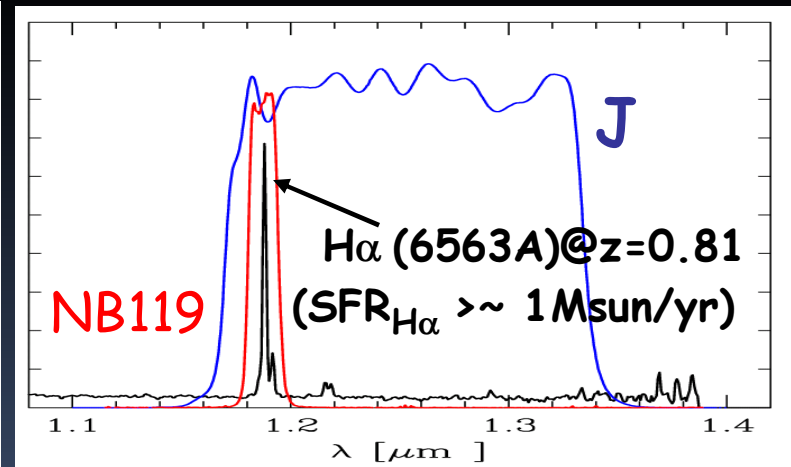
z=0 (Coma)

Quiescent at z~0

This talk

Hα @1.19um with MOIRCS J / NB119

z=0.81 (RXJ1716)

Hayashi-san's talk

[OII] @9130A with Suprime-Cam z' / NB912

z=1.46 (XCS2215)

Active at z>~1 ?

Mapping star formation around the RXJ1716 cluster at z=0.81 with Hα and MIR

Subaru/S-Cam (*V R i' z'*) MOIRCS (*J, NB119*) AKARI / IRC (*3, 7, 15μm*)
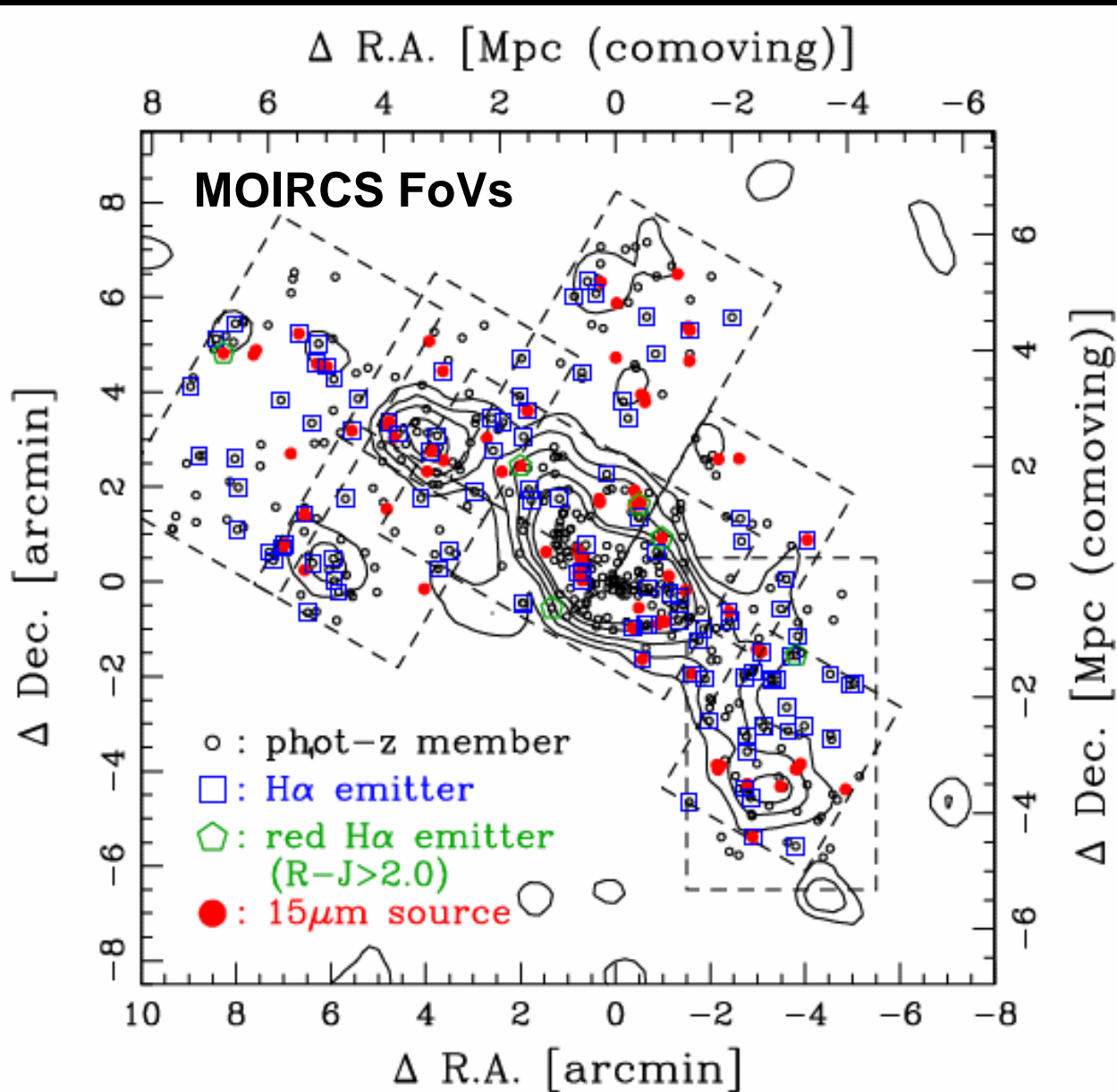
Subaru / AKARI Joint Survey
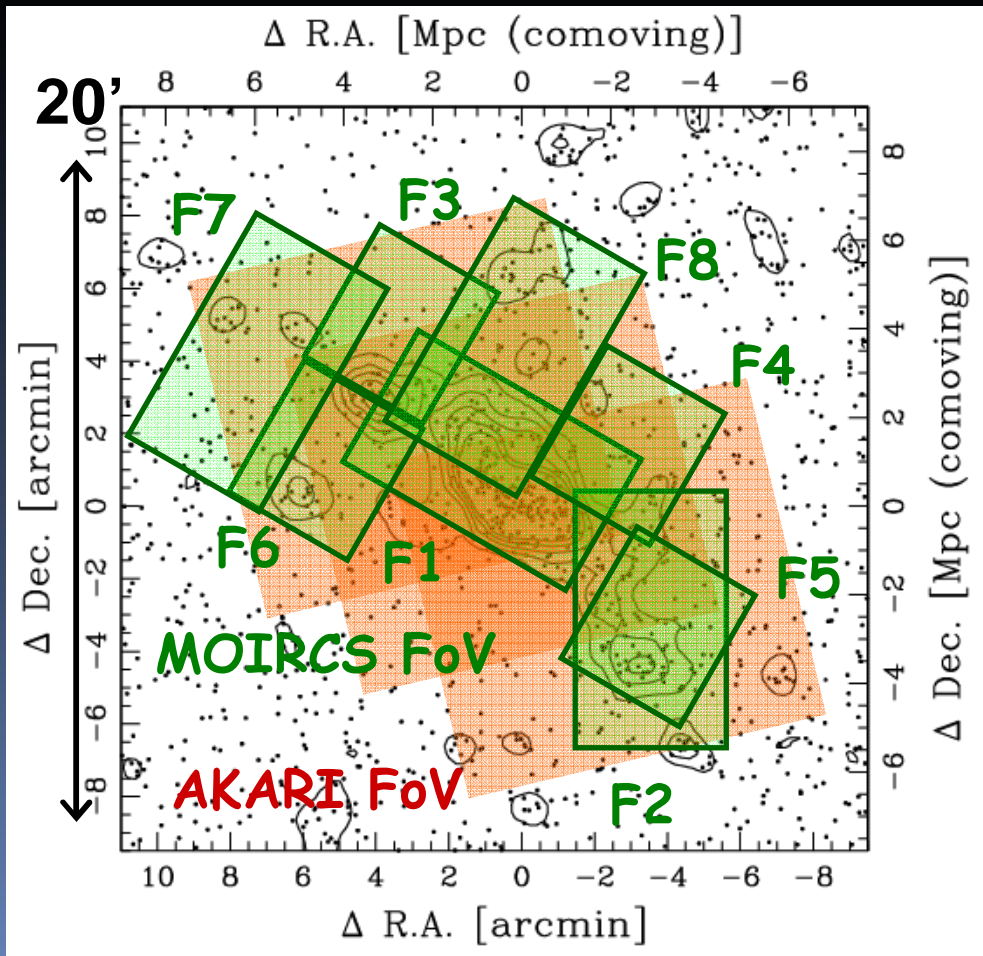
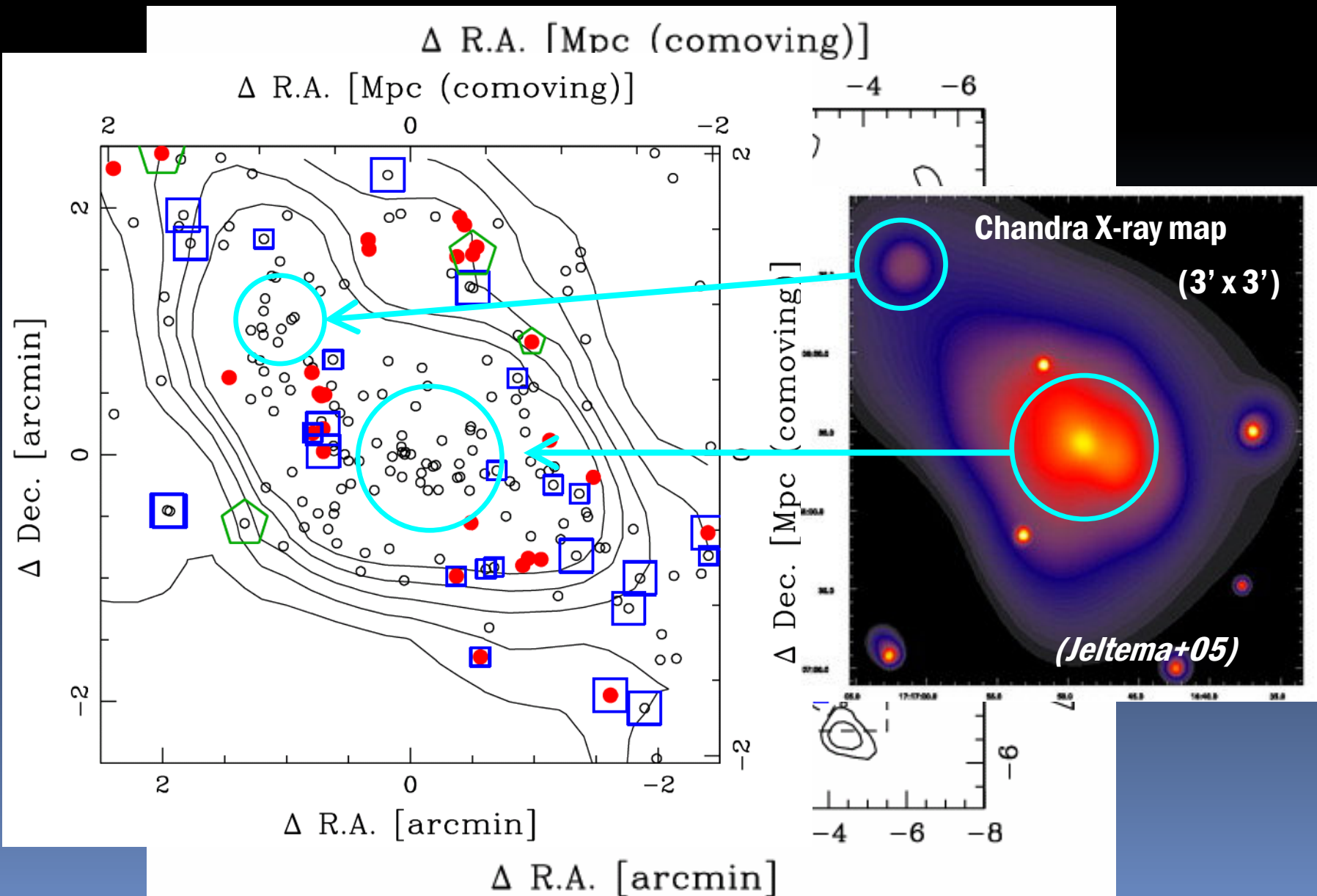# Selection of Hα emitters at z=0.81

Hα emitters are selected in a normal way:

J-NB colour excess + appropriate broad-band colour
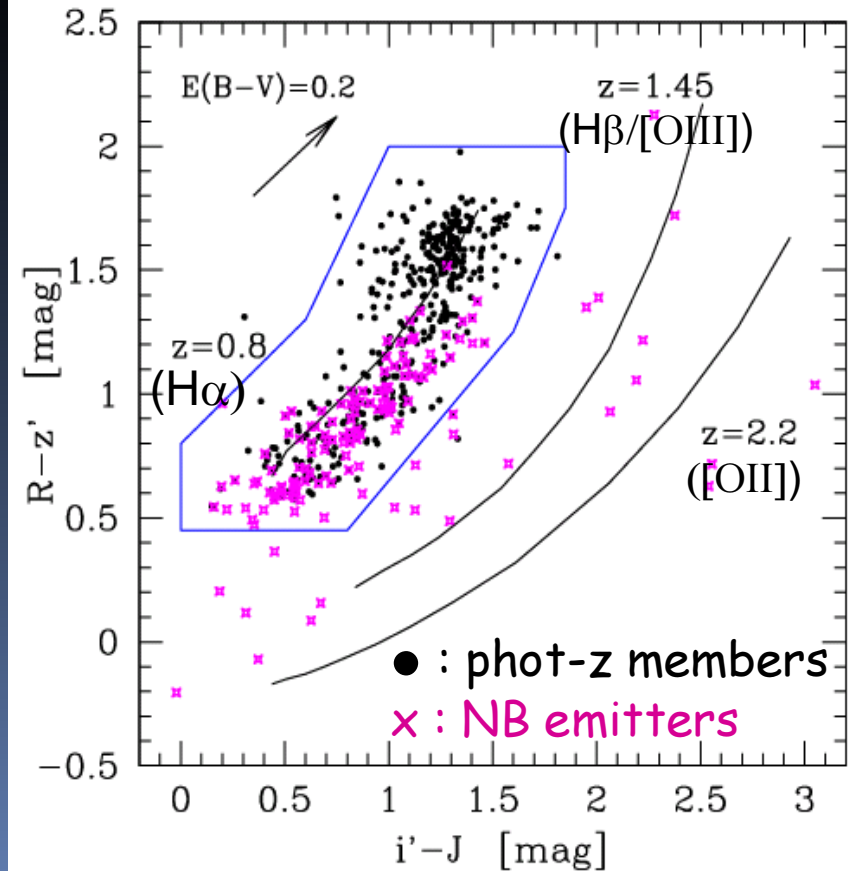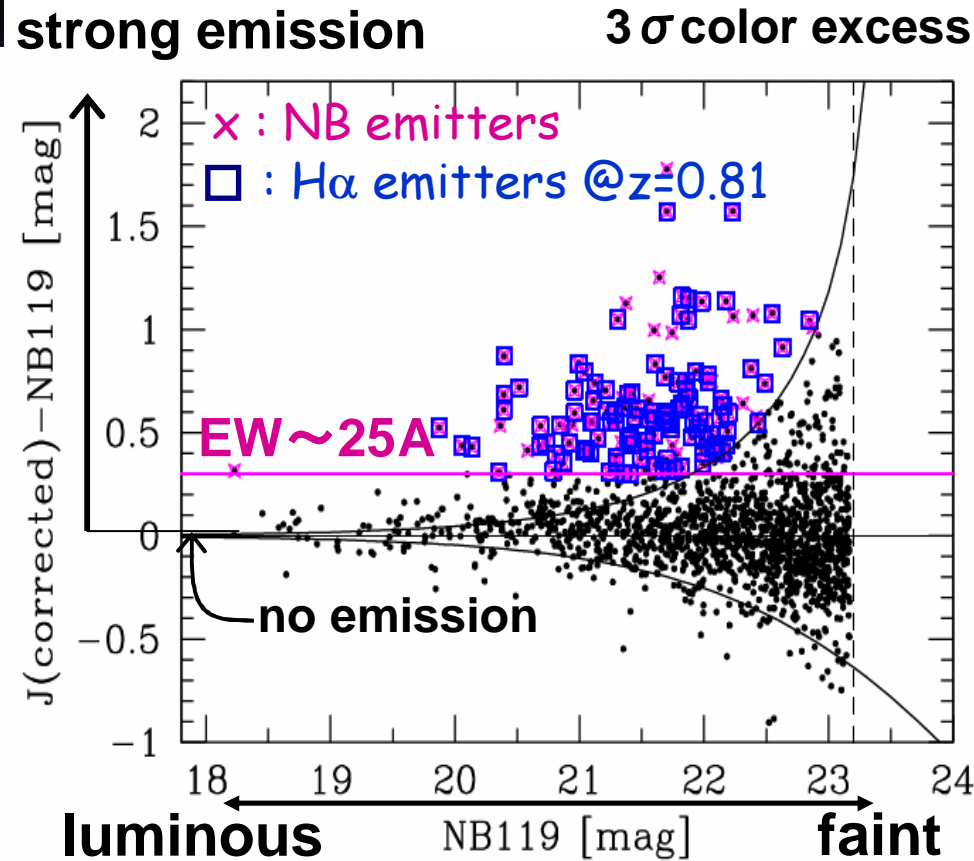
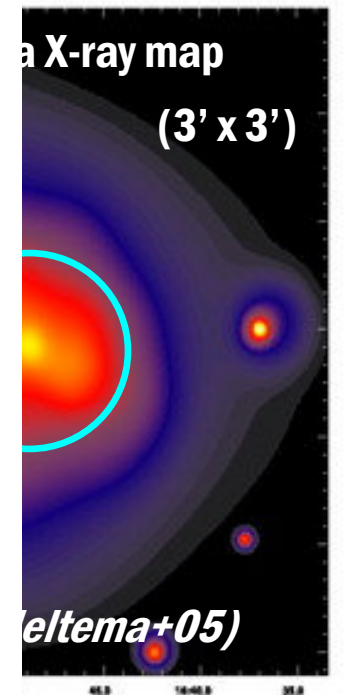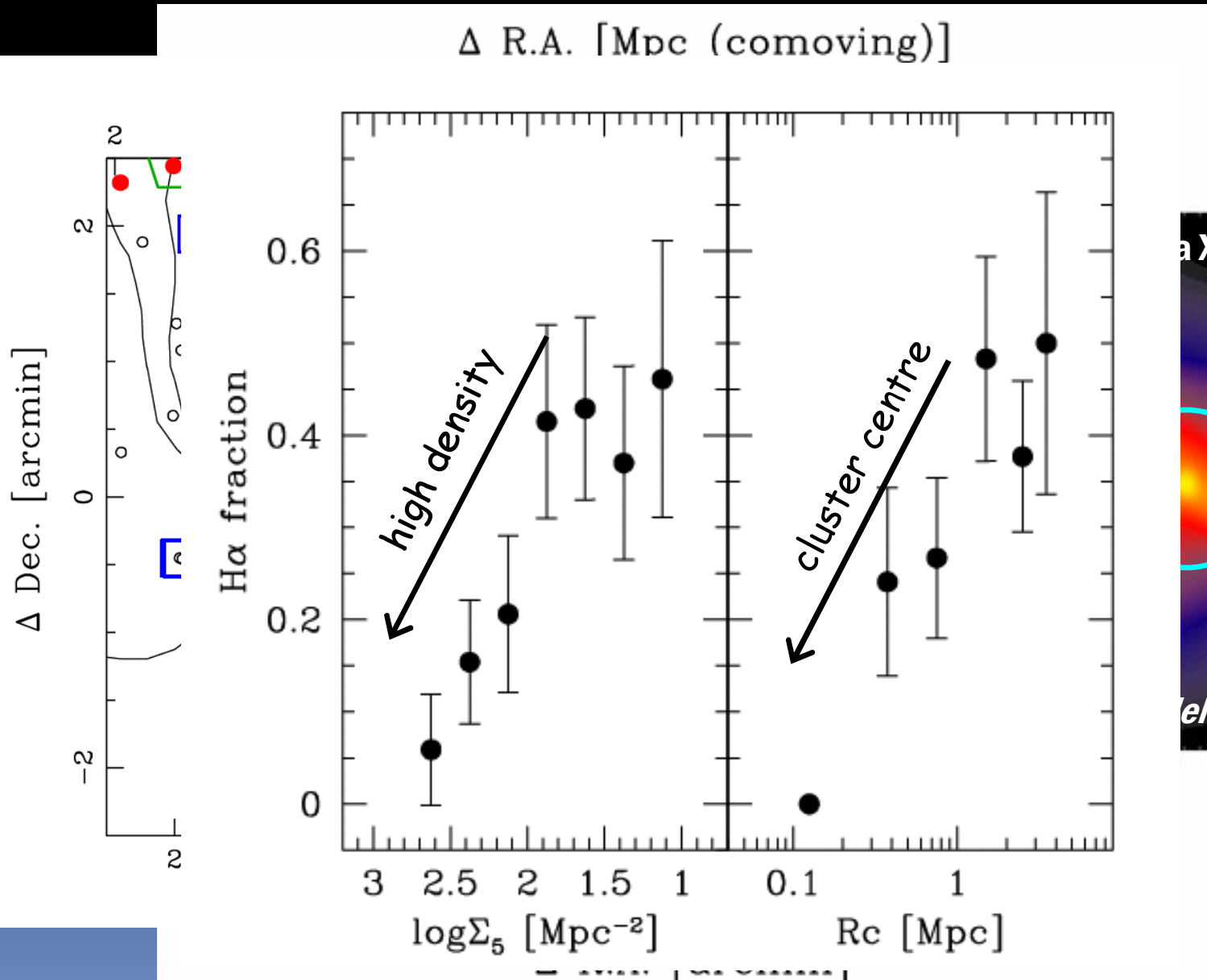# Spatial distribution of Hα emitter/MIR source

Spatial distribution of Hα emitter/MIR source

Chandra X-ray map

(3' x 3')

(Jeltema+05)

Δ R.A. [Mpc (comoving)]

high density

cluster centre

a X-ray map
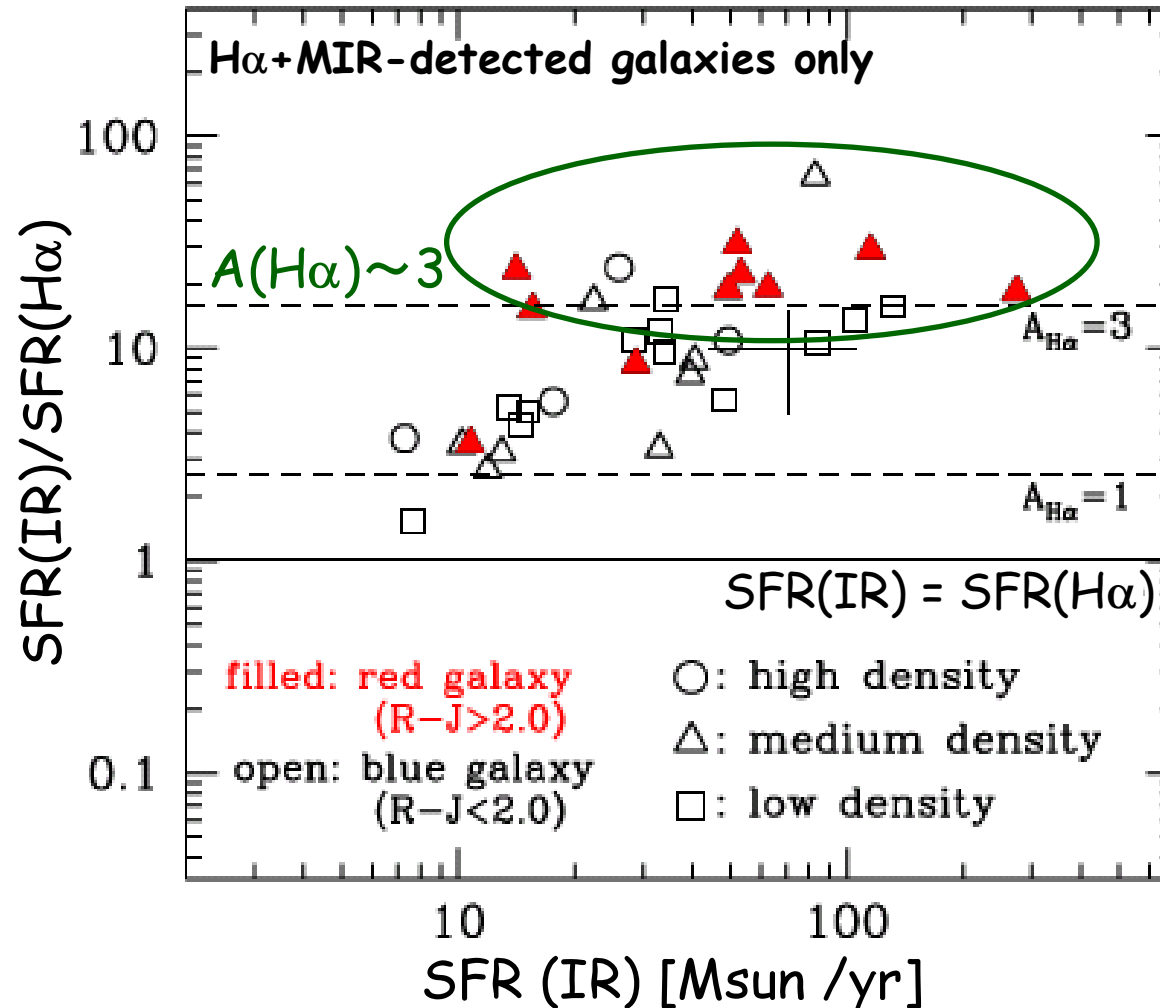
(3' x 3')

(eltema+05)

Optical colours of Hα emitters/MIR sources

Hα emitters are blue SF galaxies. MIR galaxies tend to be redder.
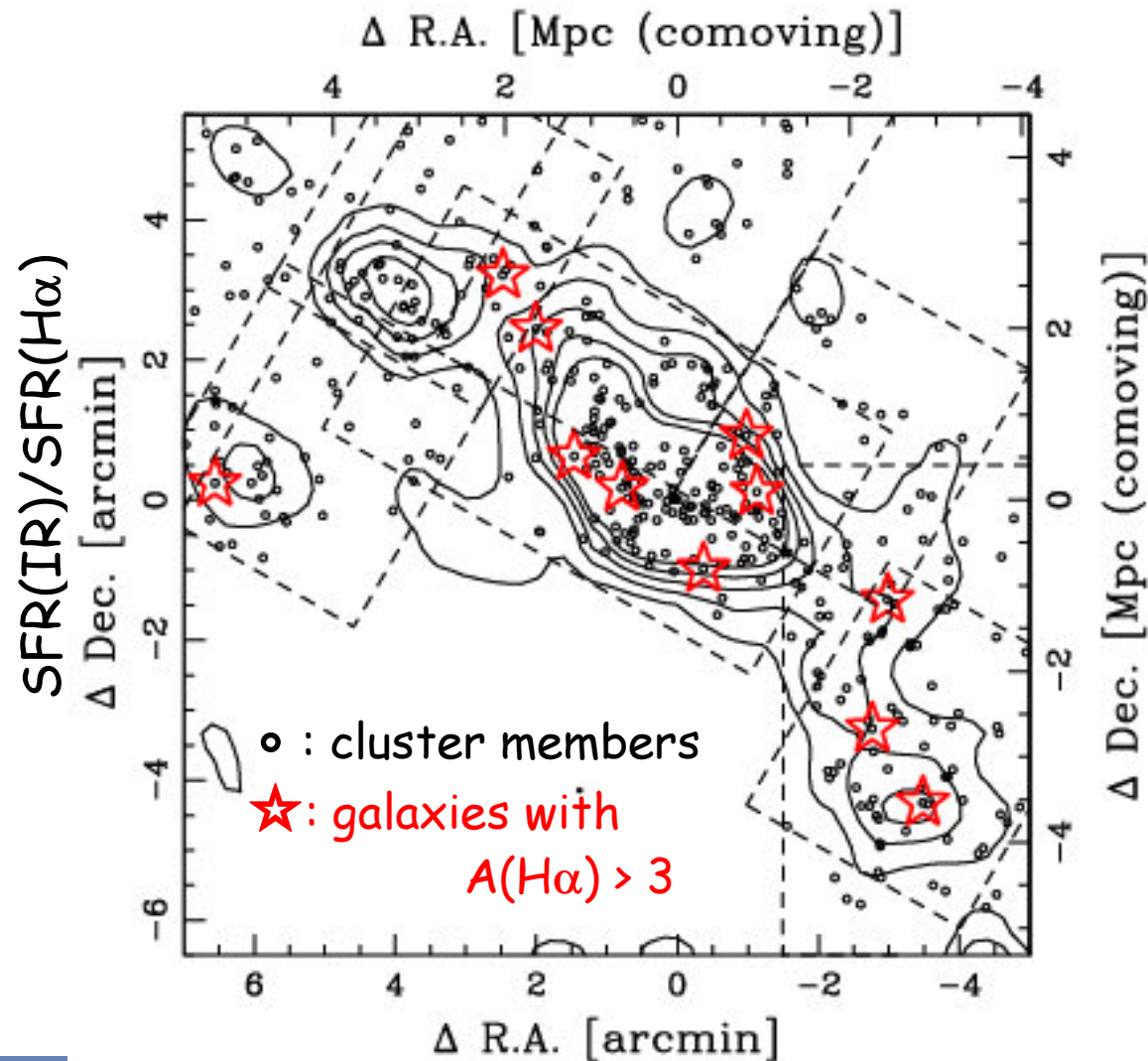
Dusty red galaxies are preferentially found in the cluster outskirts.
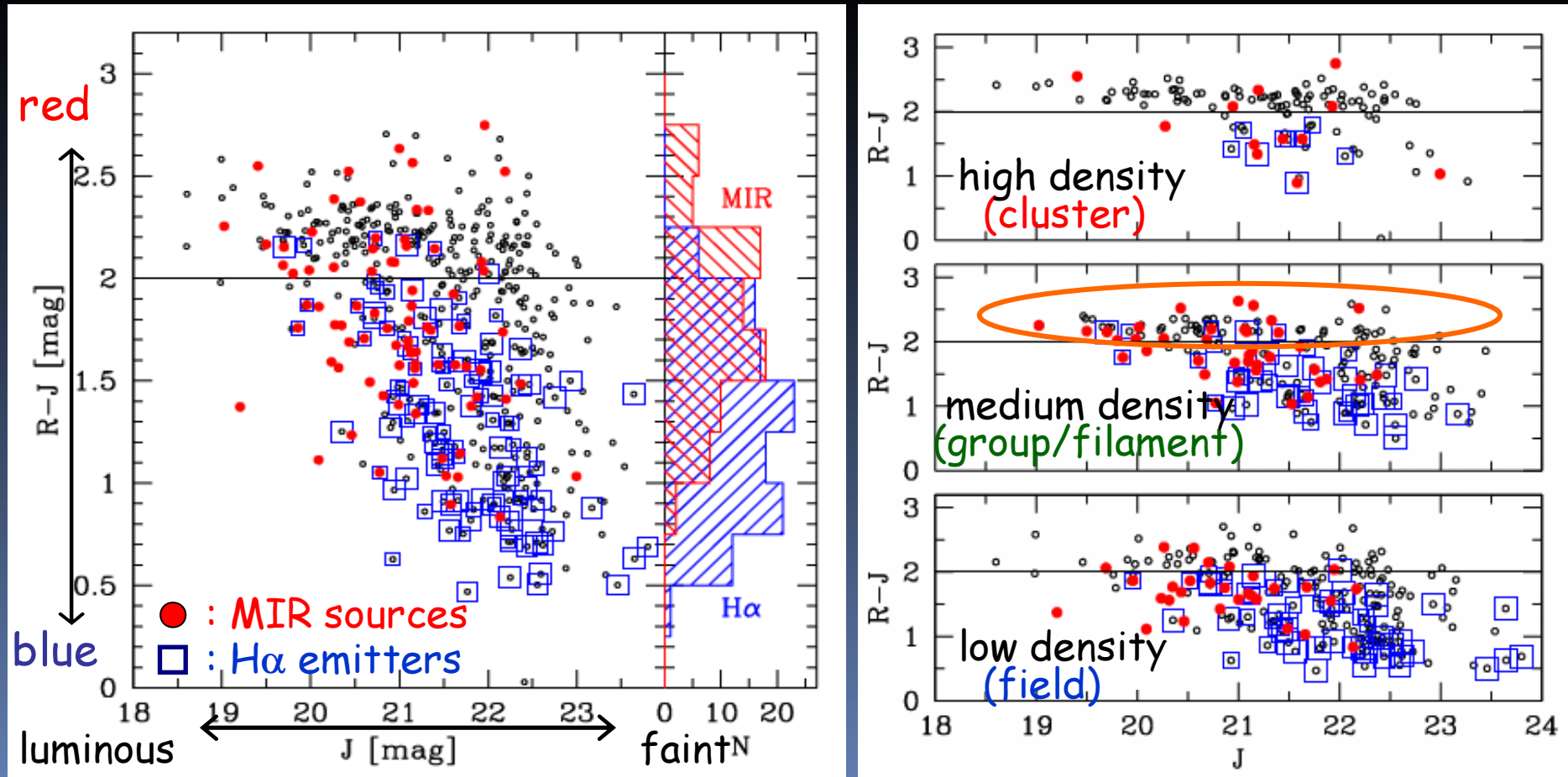
Evidence for the hidden star formation (or AGNs) especially in the cluster outskirts
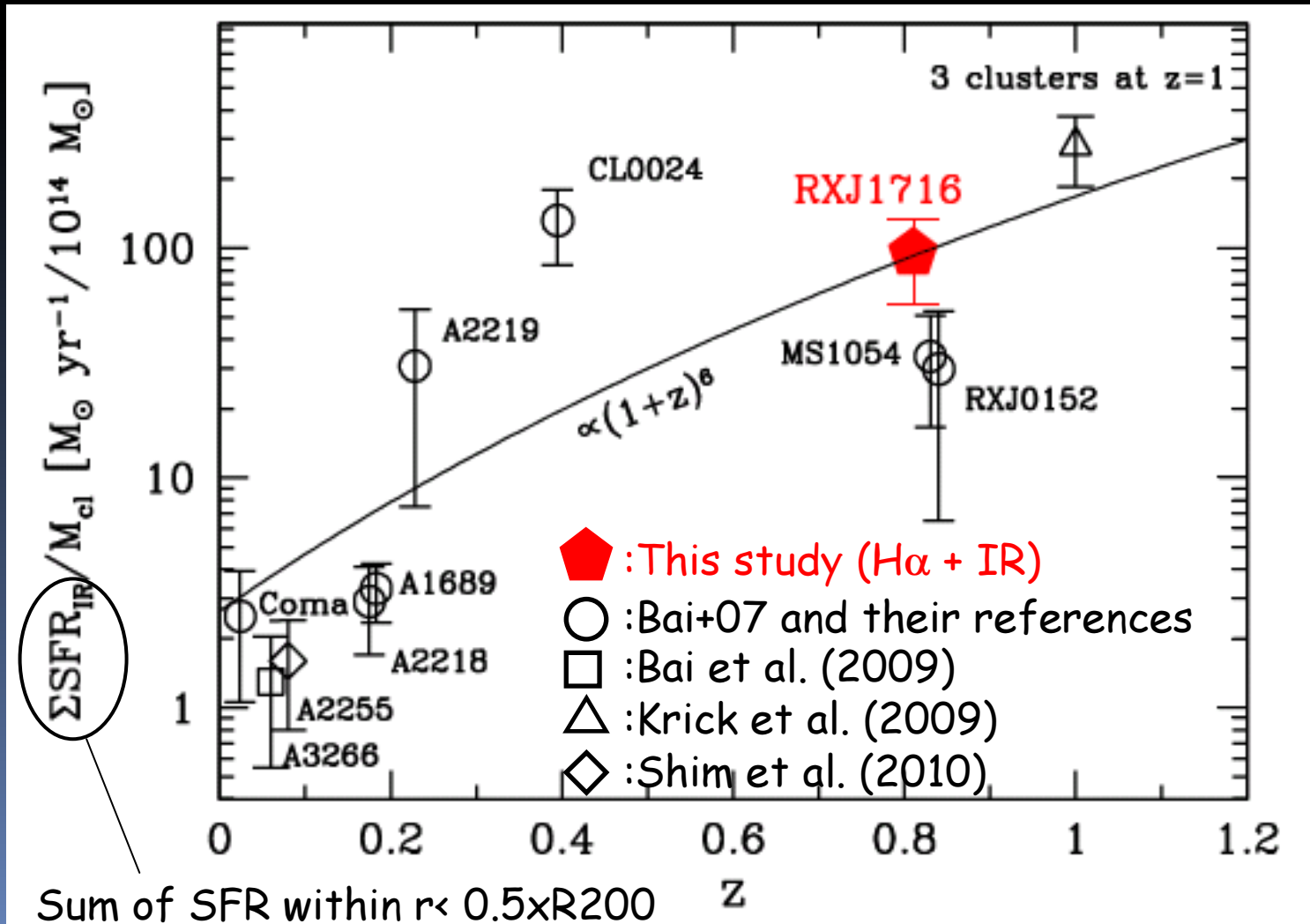
Evidence for the hidden star formation (or AGNs) especially in the cluster outskirts

Cluster "total" star formation and its evolution

Dramatic decrease in the mass-normalized cluster SFR since z ~ 1

Summary

A Hα+MIR imaging survey of a z=0.81 cluster is now completed.

■ Mapping star formation in/around the RXJ1716 cluster
  – Neither Hα emitters nor MIR galaxies are found in the core.
  – Different from z~1.5 cluster ? → Hayashi-san's talk

■ Hidden activity and its environmental dependence
  – SFR(IR)/SFR(Hα) > 20 in the extreme cases
  – Dusty galaxies are preferentially found in the cluster outskirts
    (witnessing an important stage in the history of cluster galaxies ?)

■ Dramatic decrease of SF activity in clusters since z~1
  – Mass-normalized cluster SFR decrease following $\sim(1+z)^6$
  – Need more high-z cluster sample at z>~1