

Advantages at Multi-wavelengths: A Pre-processed Galaxy Group within a Cluster

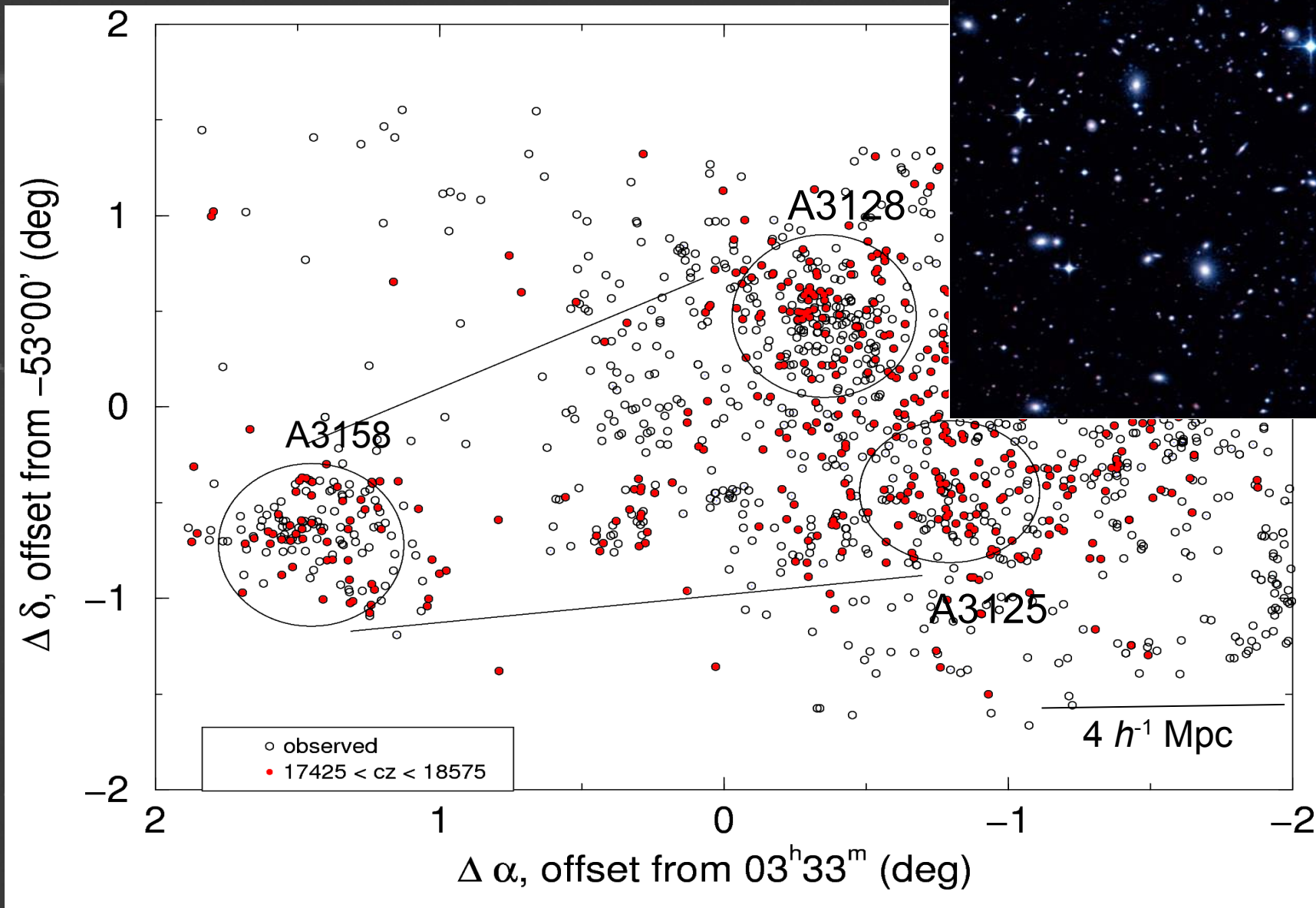
Collaborators:

Melanie Johnston-Hollitt, University of Victoria at Wellington (NZ)

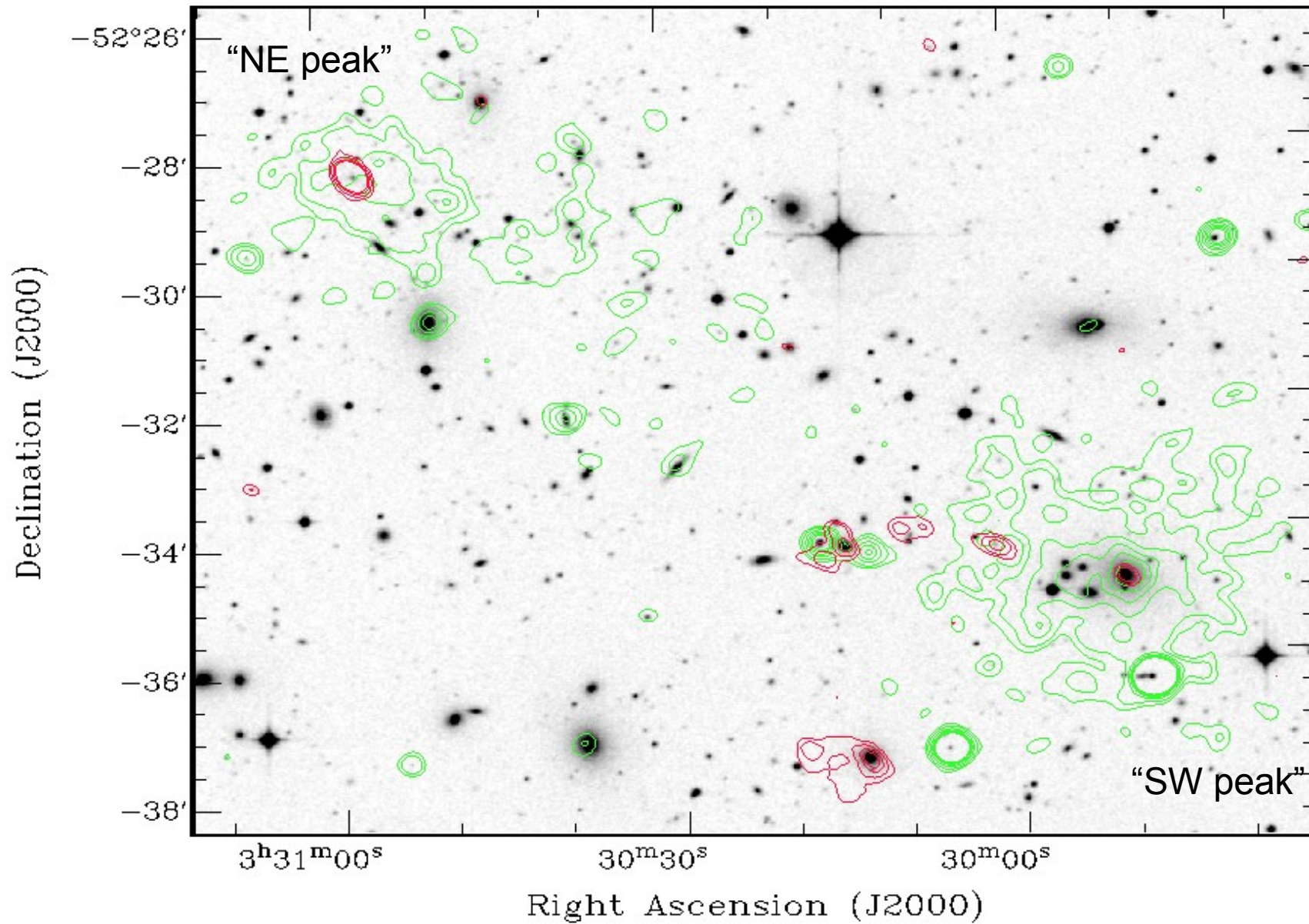
Matthew E. Potts, Roanoke College (VA)

Abell 3128 History

$z \sim 0.06$ ($18,000 \text{ km s}^{-1}$); $\sigma \sim 900 \text{ km s}^{-1}$



Abell 3128 History



Chandra ACIS-I Imaging (green); 1.4 GHz low-resolution imaging (red)

Rose et al. (2002)

Abell 3128 History



0.5 h^{-1} Mpc

Abell 3128 History

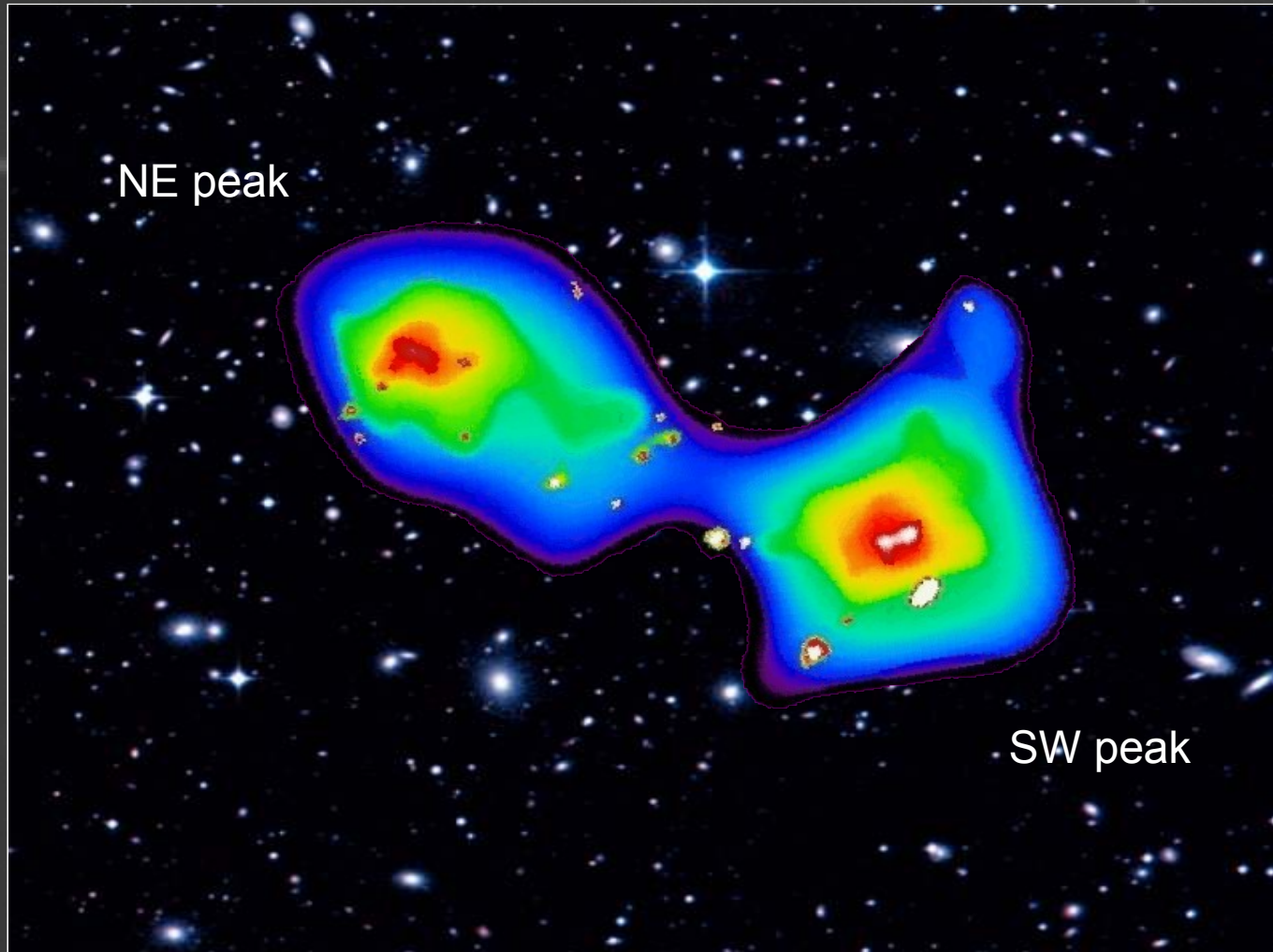
Details

$kT = 5.1 \text{ keV}$

$\beta = 0.41$

$r_c = 155 \text{ kpc}$

$\text{Fe} = 0.47$



Details

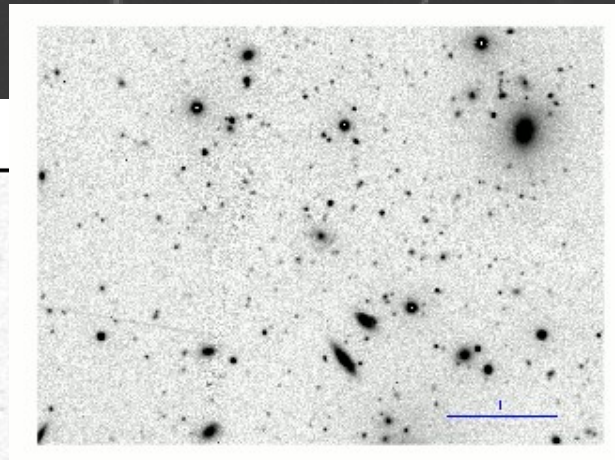
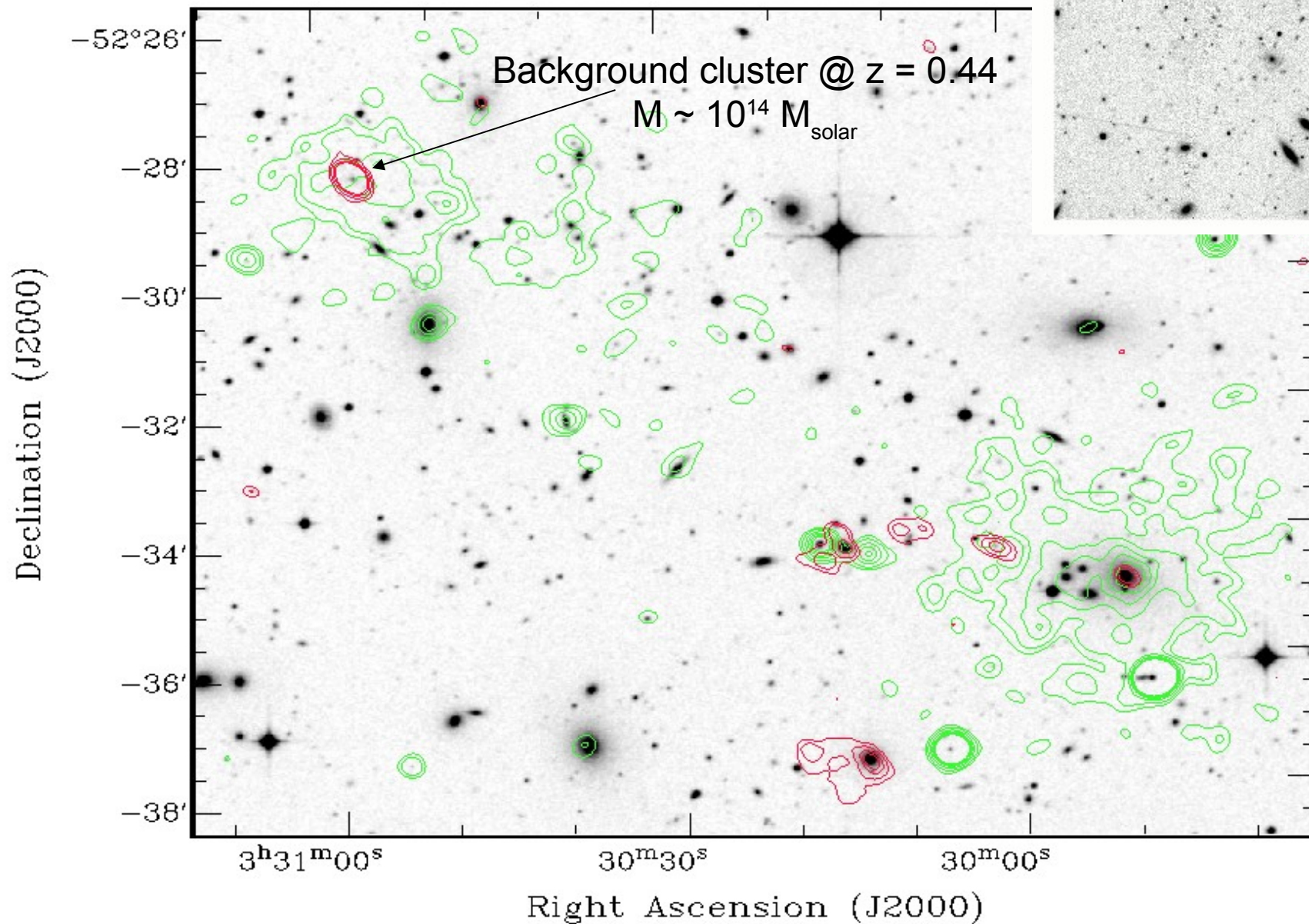
$kT \approx 3.3 \text{ keV}$

$\beta = 0.3$

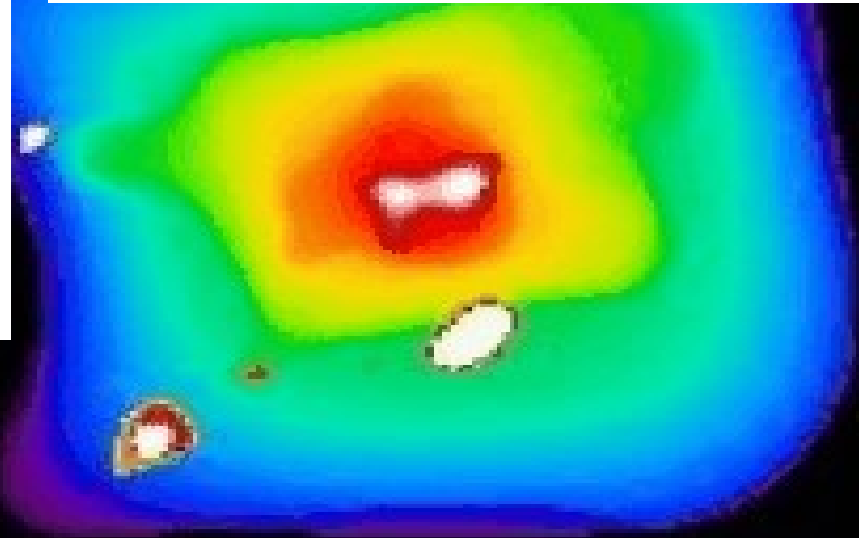
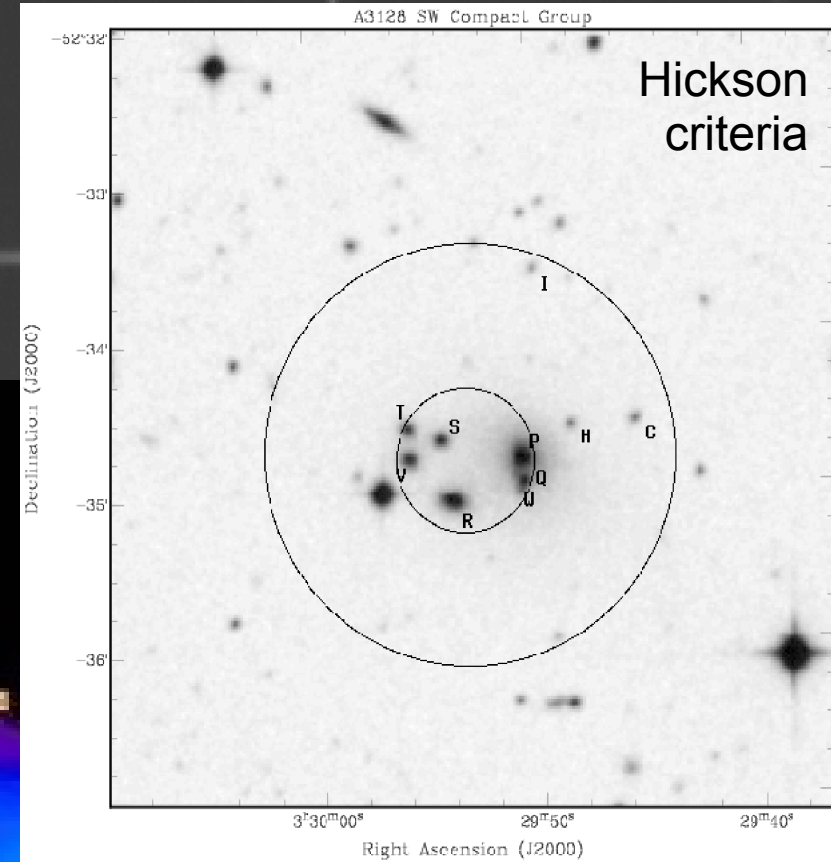
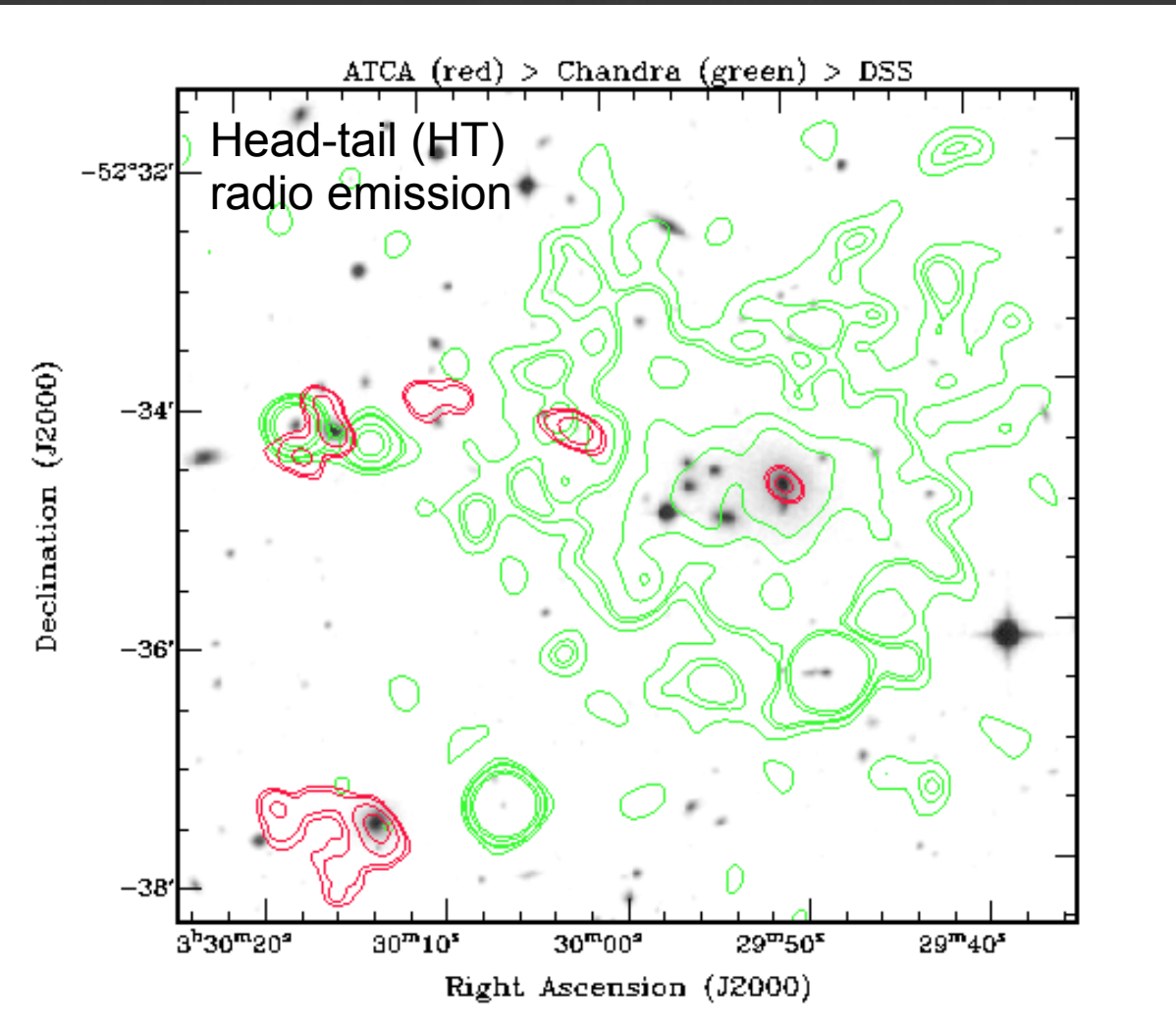
$r_c = 30 \text{ kpc}$

$\text{Fe} = 0.69$

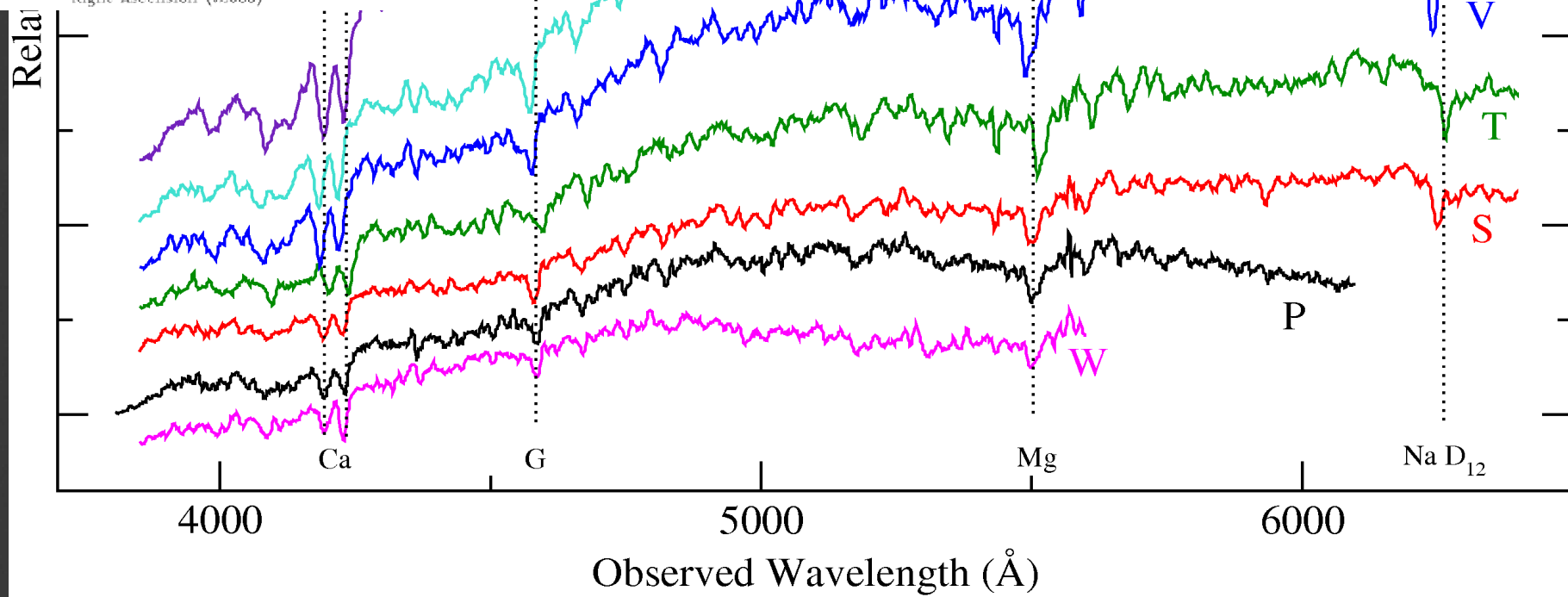
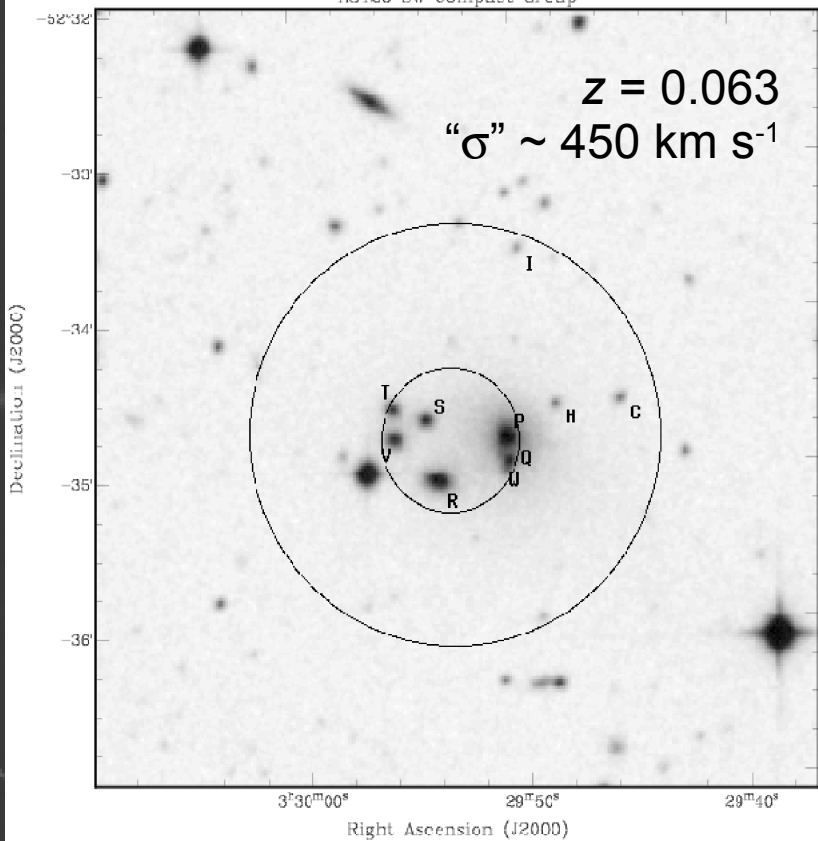
Abell 3128 History



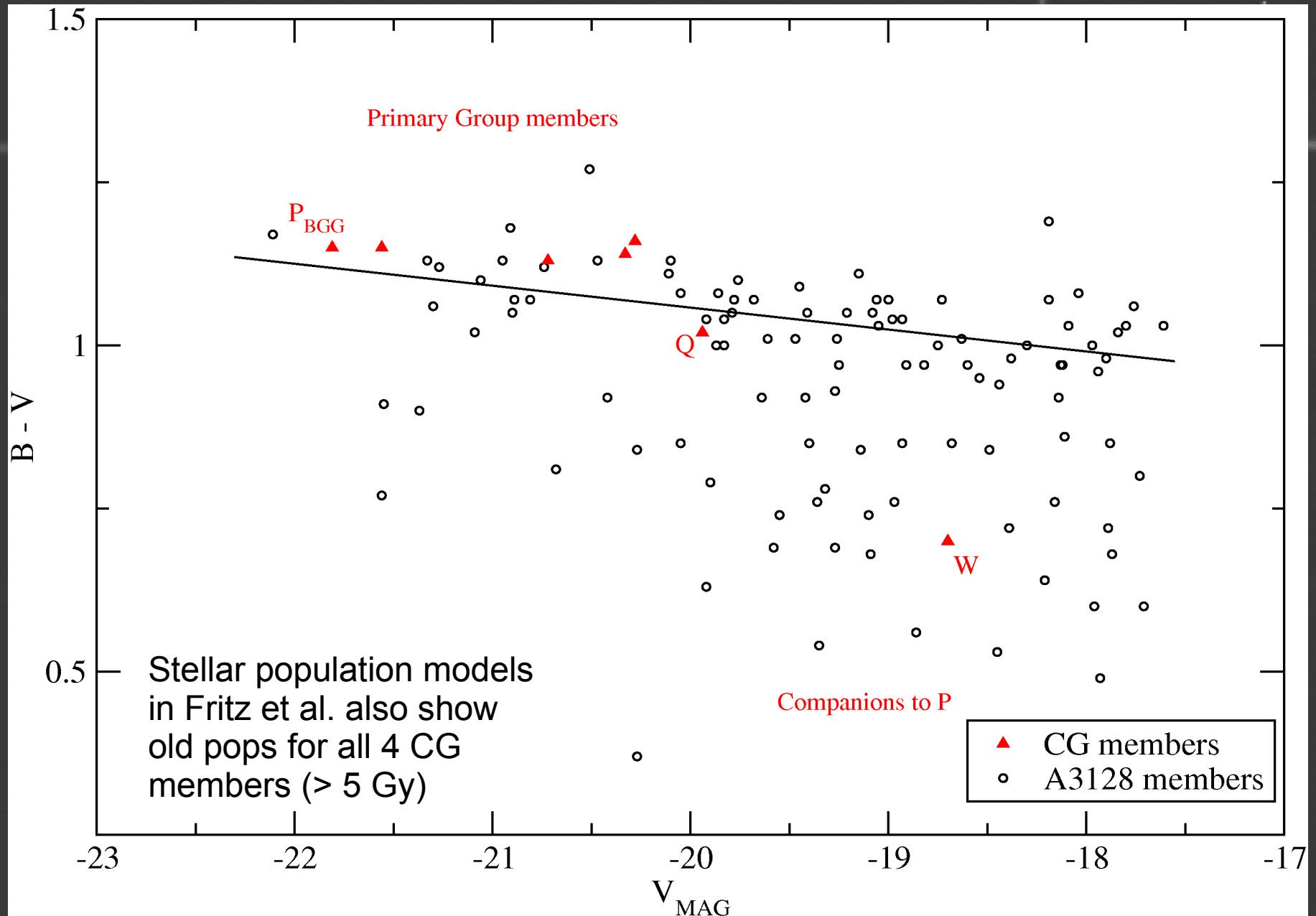
Southwest Group Observations and Properties



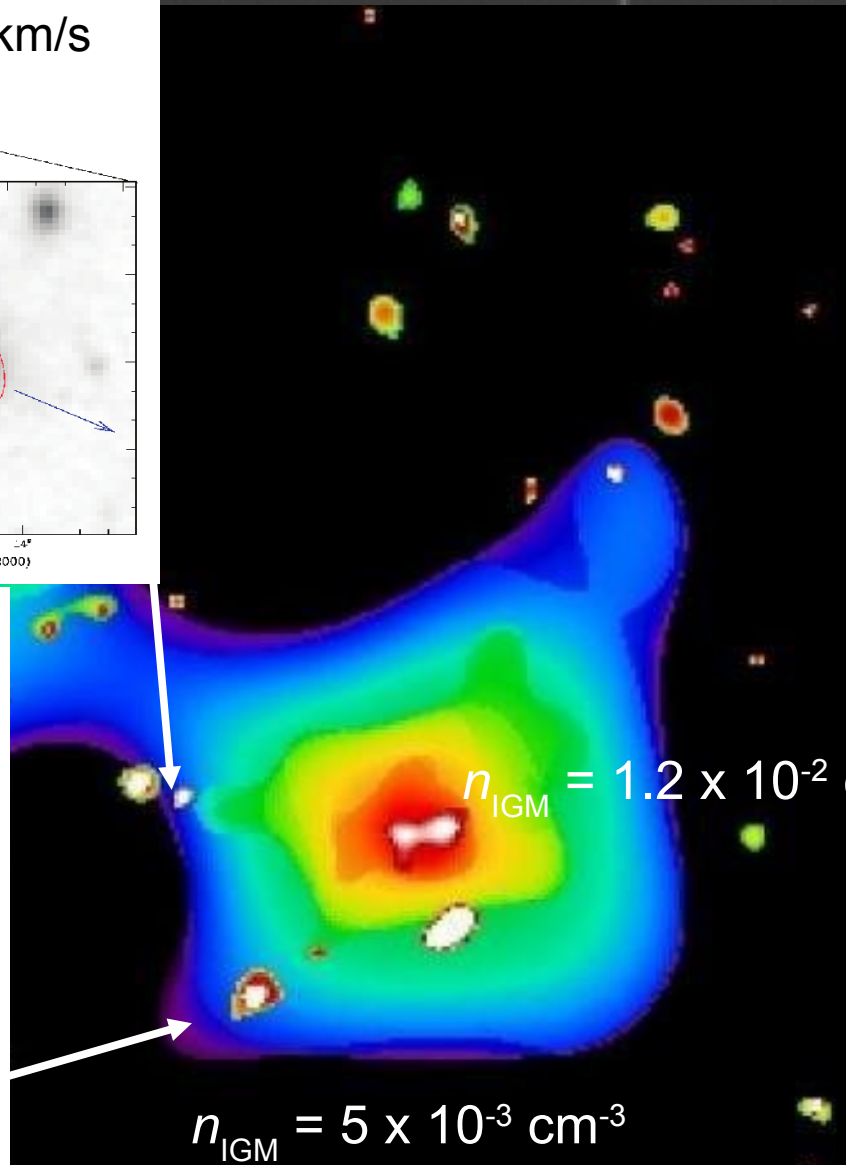
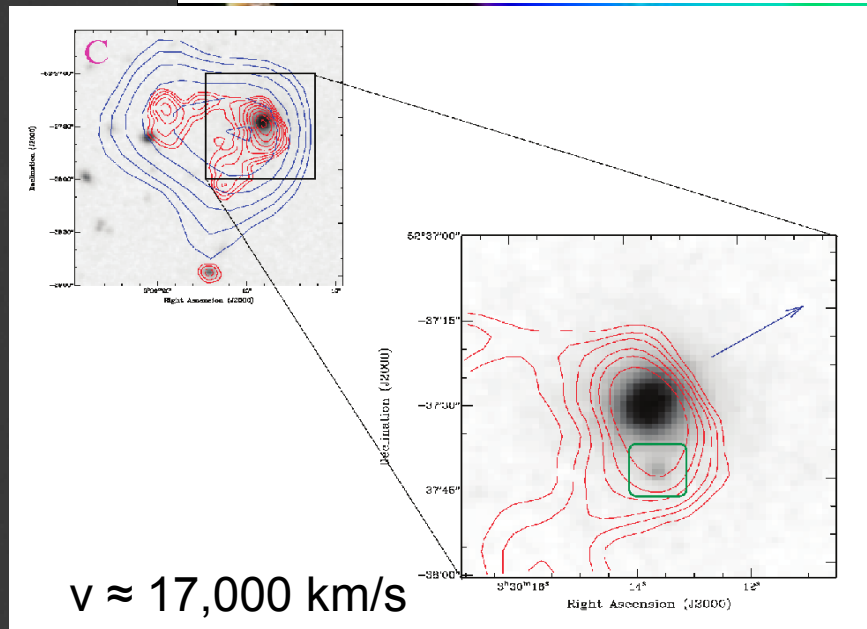
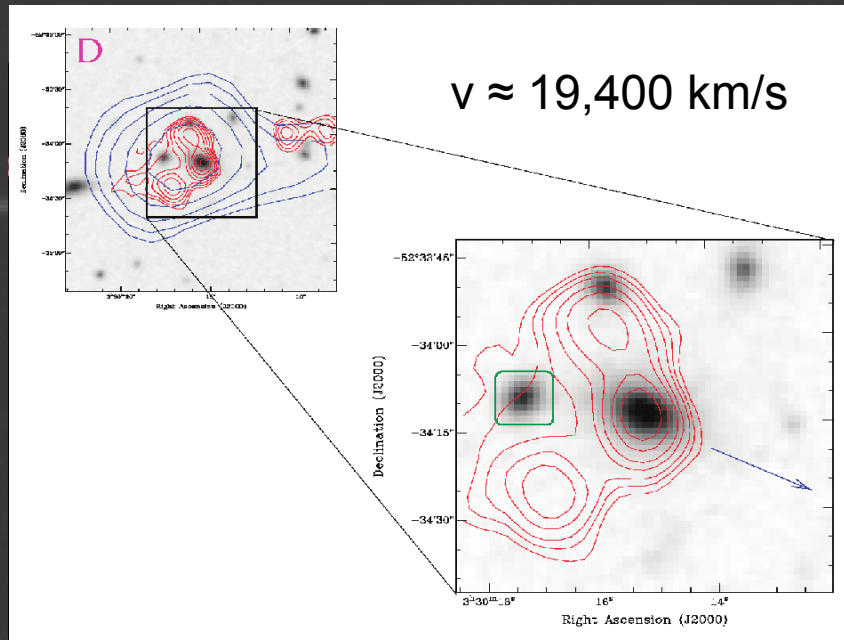
Spectroscopic Observations and Group Properties



Color-Magnitude Relation



Inferences from Radio Observations and HT Galaxies

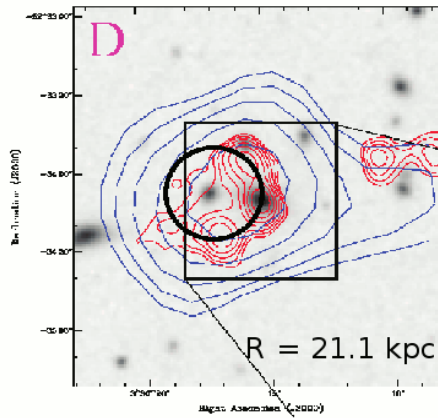


Euler equation and HT Galaxies

$$\frac{\rho_{IGM} v^2}{h} = \frac{w \Gamma^2 \beta^2}{R}$$

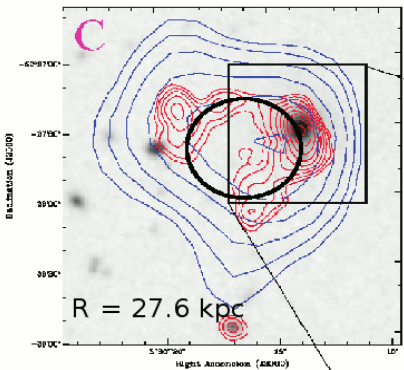
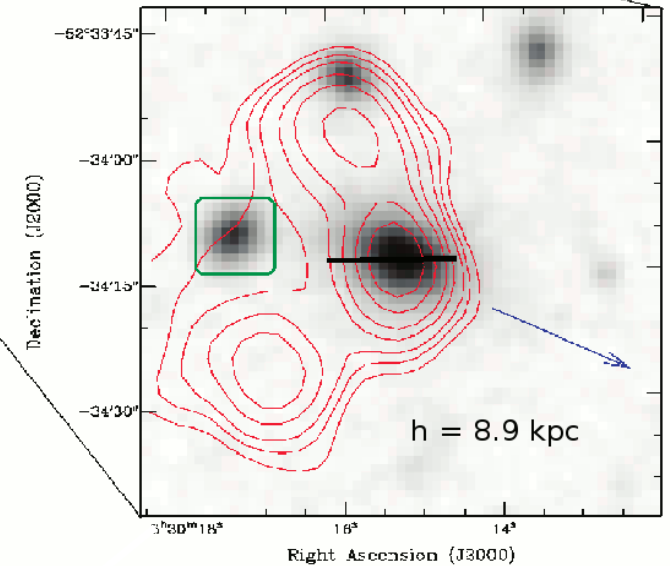
$$n_{IGM} = 5 \times 10^{-3} \text{ cm}^{-3}$$

$$w \approx 4P_{\min} \approx 4(L_{\text{rad}}/\text{Volume})^{4/7}$$



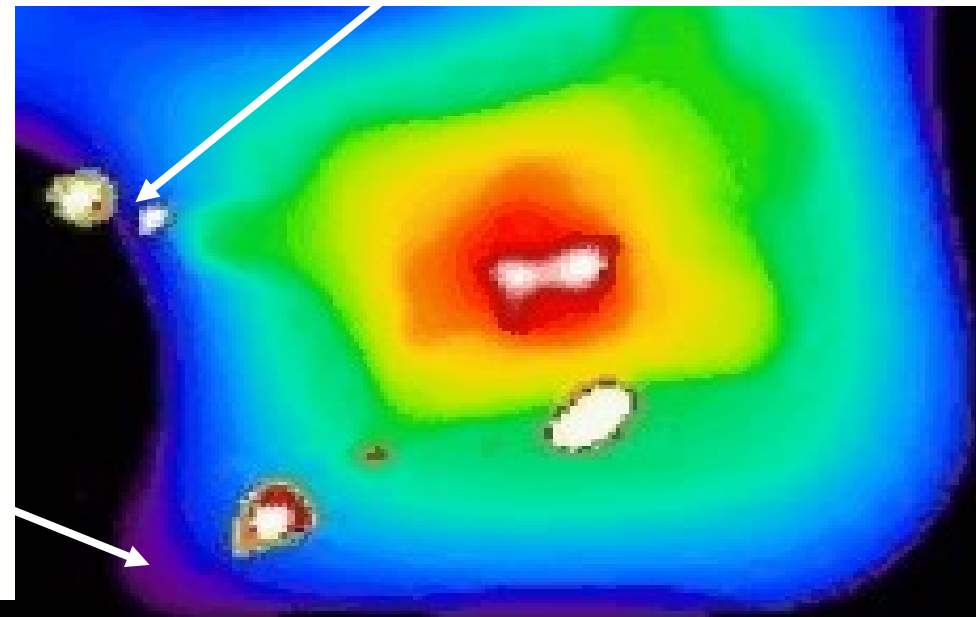
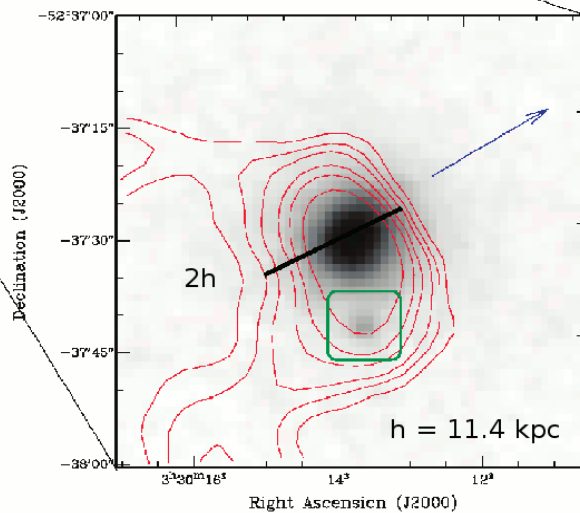
$$L_{1.4\text{GHz}} = 1.62 \times 10^{24} \text{ W Hz}^{-1}$$

$$v \sim 500 - 1000 \text{ km/s}$$



$$L_{1.4\text{GHz}} = 3.12 \times 10^{24} \text{ W Hz}^{-1}$$

$$v \sim 500 - 1000 \text{ km/s}$$



Summary

- Group is confined within X-ray halo and shows isolation and shows characteristics consistent with compact groups
- Stellar populations of primary group galaxies (non-companions) are “old” (G/K) and not currently star-forming
- Radio wavelength extended emission from local head-tail galaxies is consistent with foreign group infall
- Multi-wavelength observations reveal unique details about the history of the environment on different timescales