

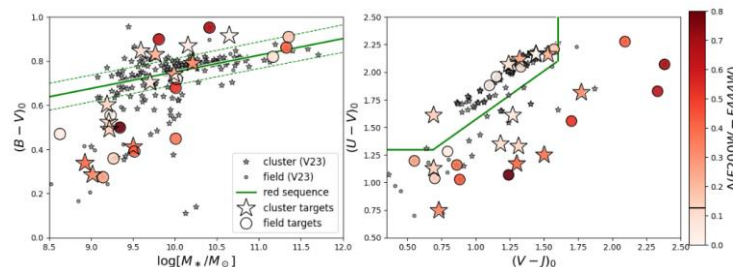
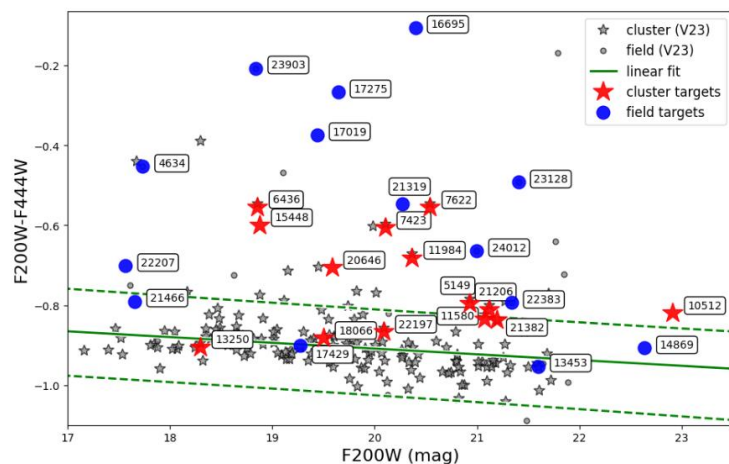
Vulcani+2024, arXiv: 2412.07070

Dusty galaxies: dust-enshrouded-starburst, active nuclei

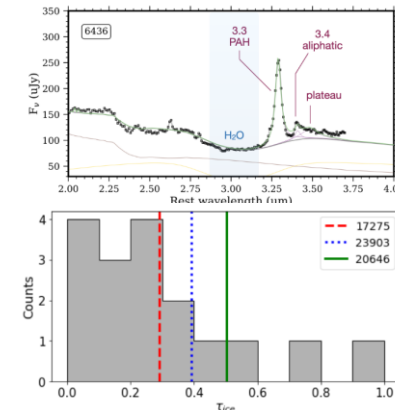
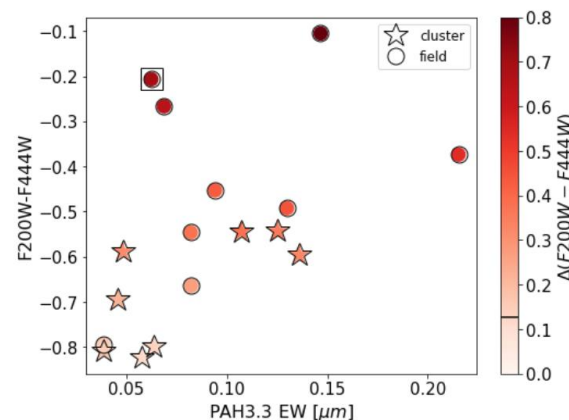
- Some environmental dependence?
 - Koyama+2008: fraction of dusty SFG is enhanced
 - Murata+2015: No dependence
- Target = Abell 2774
 - Covered by multiple JWST program
 - Vulcani+2023 identify surprisingly red F200W-F444W galaxy
 - PAH 3.3um emission?
- JWST/NIRSpec → the origin of the red excess and PAH_{3.3}

28 galaxies in the cluster and surrounding field

- 20 red outliers: redder than $3\times$ the width of the red sequence in the F200W-F444W vs F200W plane
- 8 "normal" galaxies

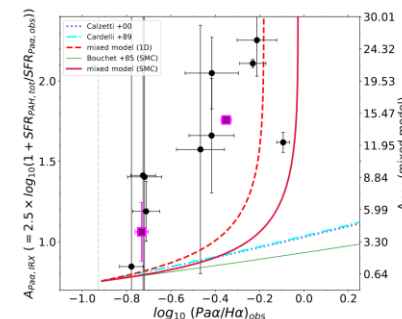
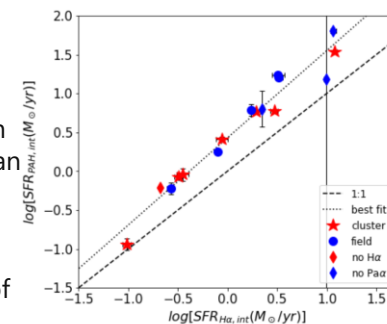


1. Emission line galaxies with clear PAH_{3.3} emission, located below the optical red sequence (14) → F200W-F444W color correlated with PAH_{3.3} EW, but PAH_{3.3} can not fully explain the color excess → Dust emission is required
2. Galaxies with PAH_{3.3} emission but weak other lines, located above the optical red sequence (3) → Outlier in F200W-F444W vs EW(PAH_{3.3}). Spectral fitting identifies a strong ice absorption → Obscured AGN?
3. Passive galaxies with no significant emission lines (3) → Red color can be explained ageing of SSP.



PAH_{3.3} EW and flux correlate with the intrinsic H α EW and flux
 → Produced by the same mechanism
 But... SFR_{PAH} is a factor of 3 higher than SFR_{H α}

- Red outliers are characterized by a significant amount of dust, that is not captured by the ratio of hydrogen lines

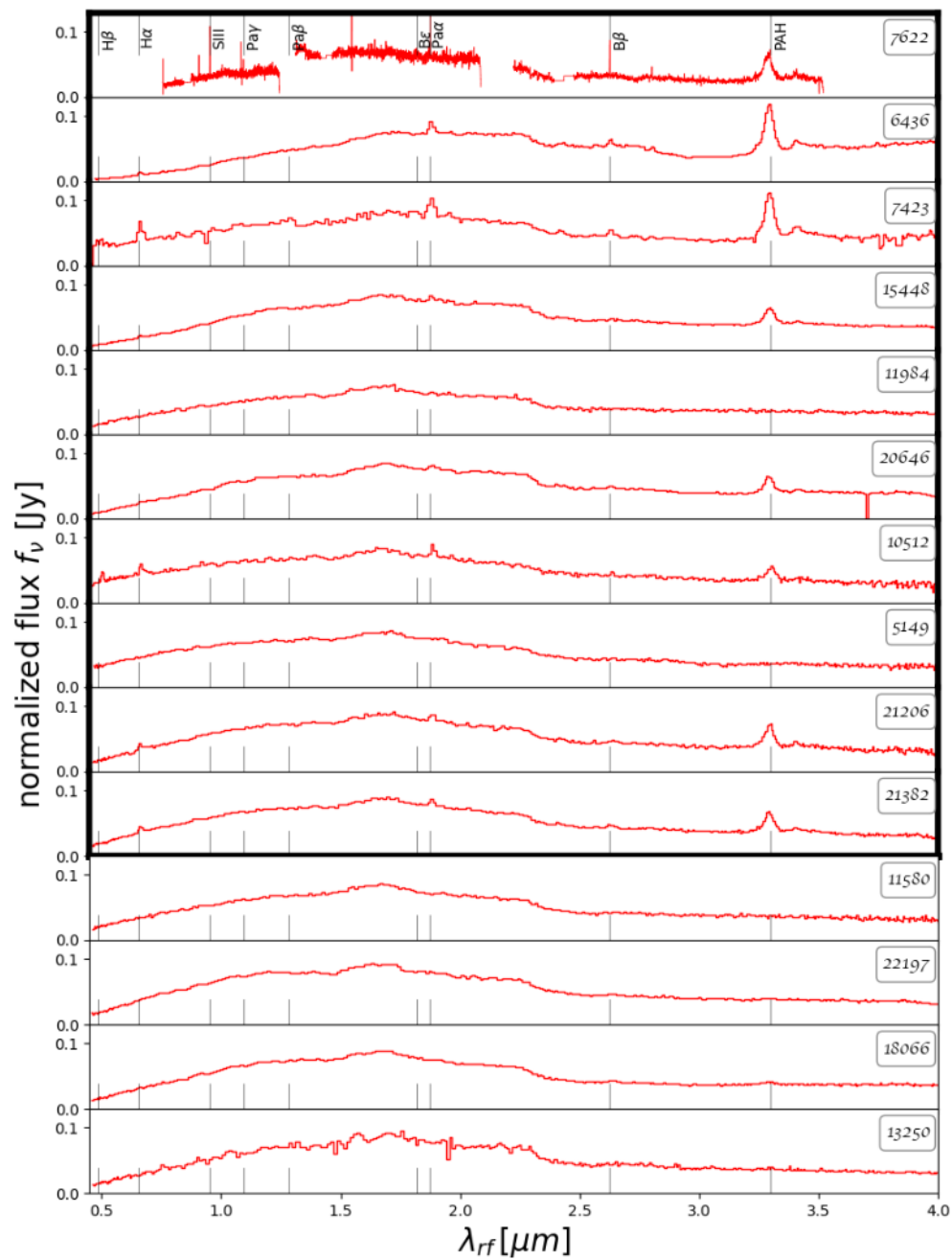


No clear difference between cluster and field galaxies

- Most likely due to the small size of their sample and the target selection (filler of JWST proposals)
- Need a larger sample to explore further

- Red outliers is a mixed population of normal dusty SFG, AGN, and passive systems
- Combining NIR color selection and traditional optical selection (color-mass and UVJ diagram) can provide a cleaner sample of star-forming systems

Cluster galaxies



Field galaxies

