

Hunting for jellyfish galaxies in clusters

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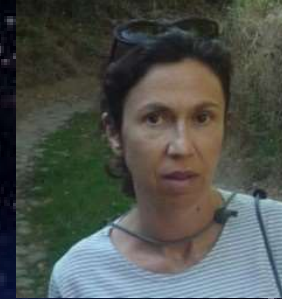
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Environmental effects on cluster galaxies

- Gravitational effects affect stars and gas
- Hydrodynamical effects affect only gas: ram pressure stripping where the hot intracluster gas interacts with the gas of infalling galaxies:
 - compression along the leading edge of the disk
 - boost in star formation during the peak stripping phase
 - then quenching of star formation
 - formation of tails of gas in the wake of the galaxy
 - condensation of star forming knots in the tails
 - asymmetric morphologies

Jellyfish galaxies

- First named by Bekki (2009) based on hydrodynamical simulations
- See series of GASP (Gas Stripping Phenomena in galaxies) papers by Poggianti et al. (VLT/MUSE data)
- Extended tails seen in ionized gas, but young stars can also be detected in broad band filters

Norma



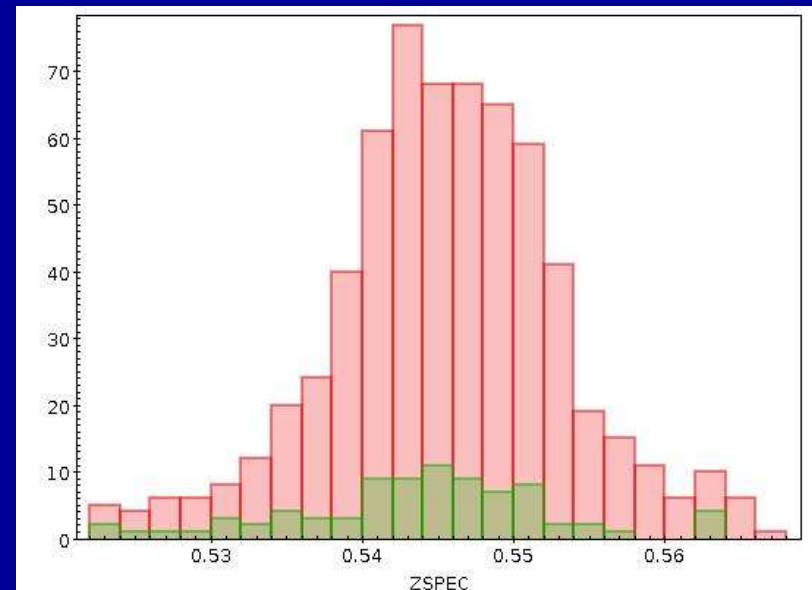
Abell 3627



Sample

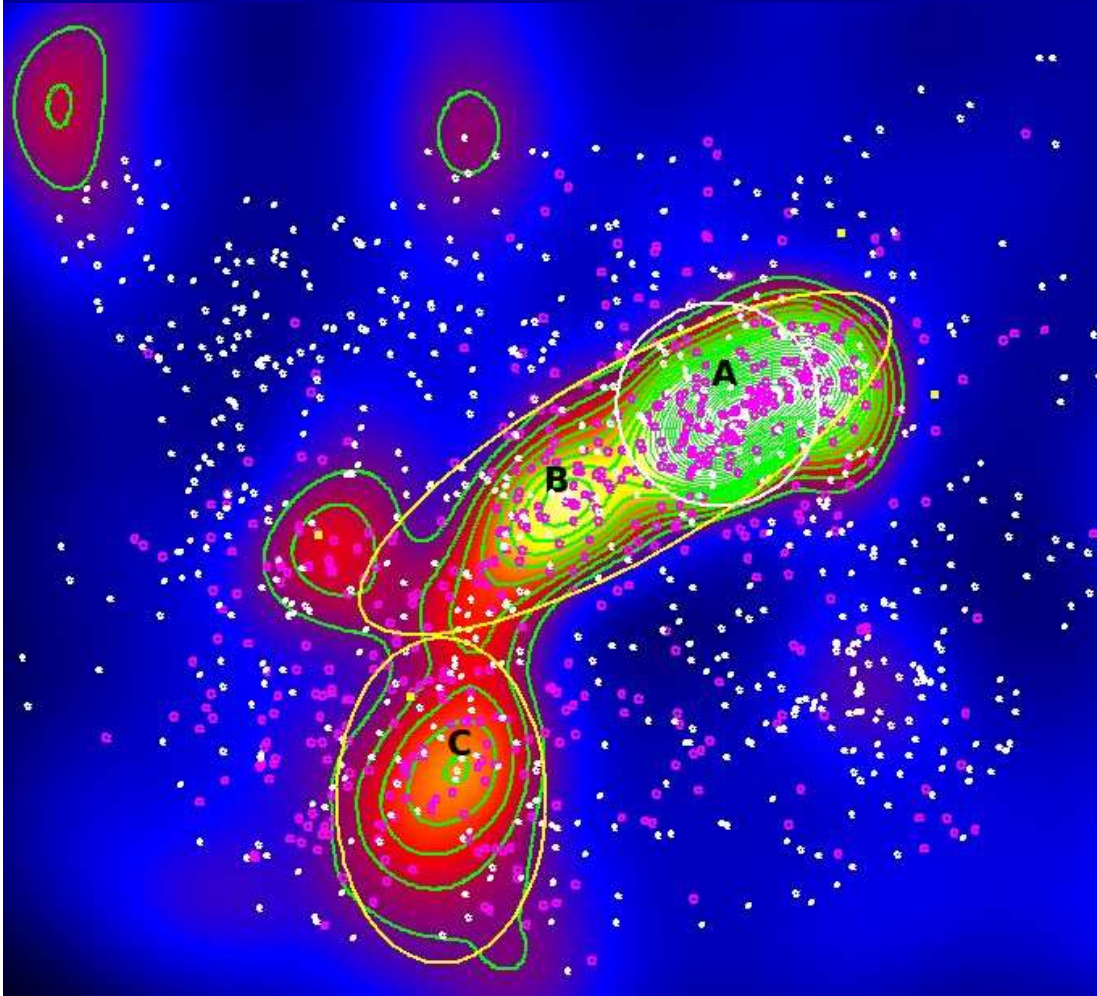
- Data: 40 clusters with HST data and galaxy spectroscopic redshifts from DAFT/FADA and CLASH surveys
- MACS J0717.6+3745: large HST mosaic
over 600 redshifts
8 magnitude optical
and IR catalogue

Red: all
Green: jellyfish



MACS J0717.6+3745 ($z=0.5458$)

large filaments



**Galaxy density map
(Subaru/SuprimeCam)**

Green contours start at 3σ

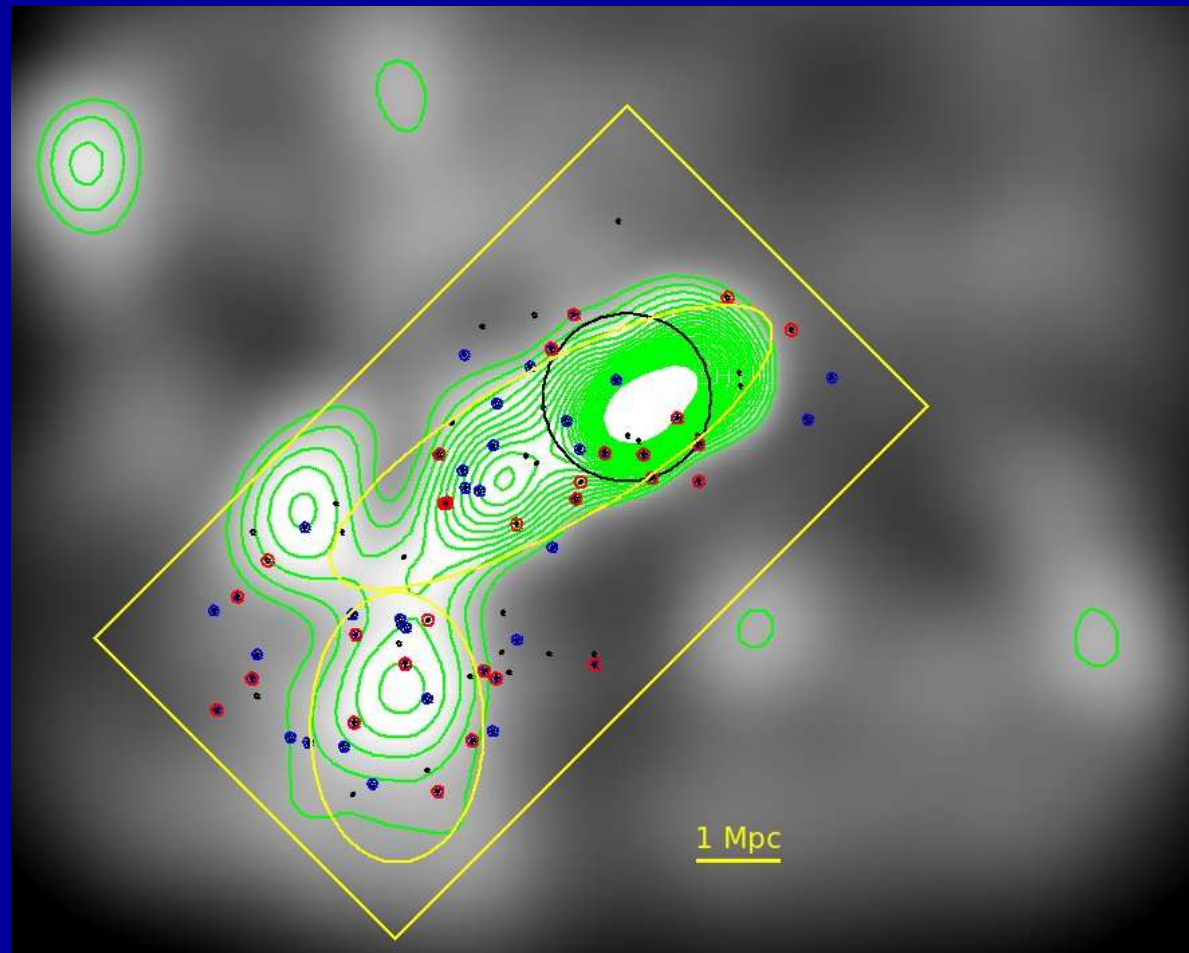
Circle = 1 Mpc radius

**Yellow ellipses=elongations:
6.0x1.8 and 3.2x2.1 Mpc**

**Pink points: galaxies at cluster
redshift**

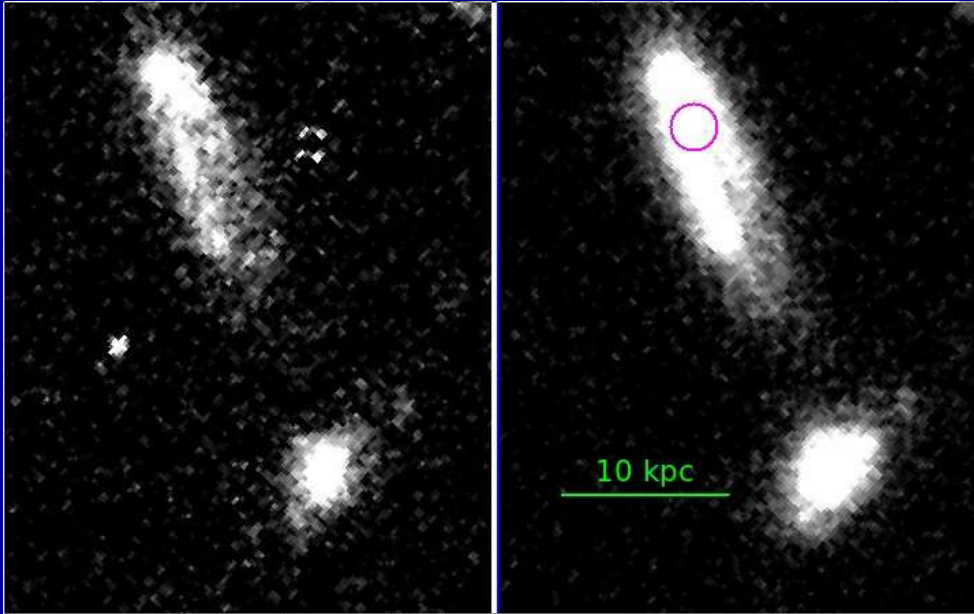
**White points: other galaxies with
measured redshifts**

84 jellyfish candidates



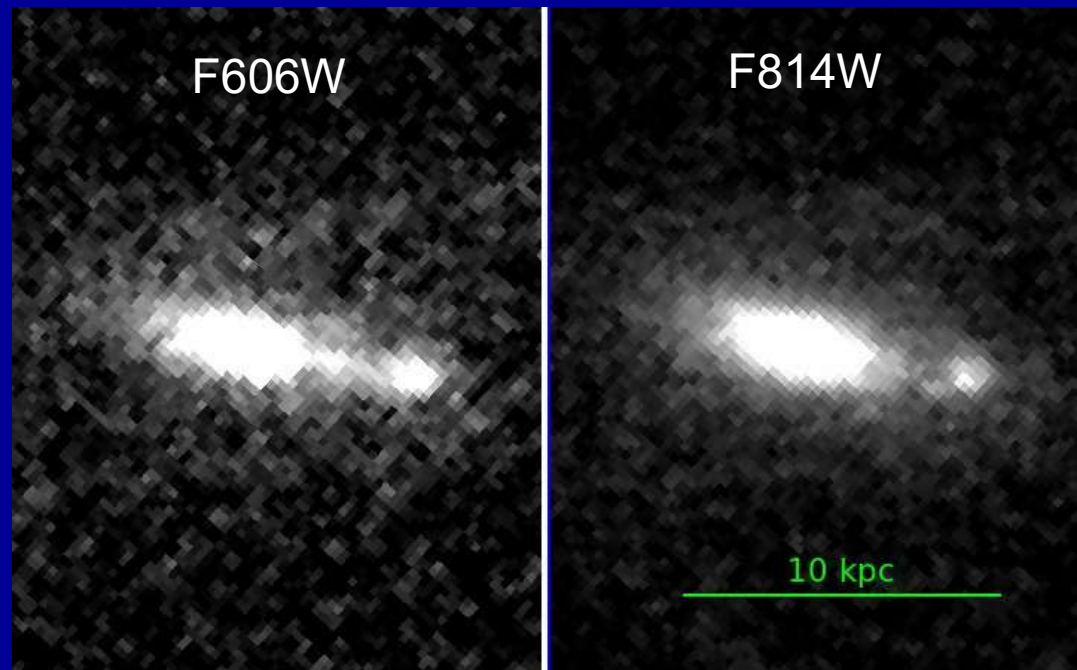
Durret, Chiche, Lobo & Jauzac 2020, A&A in revision

Examples



F606W

F814W



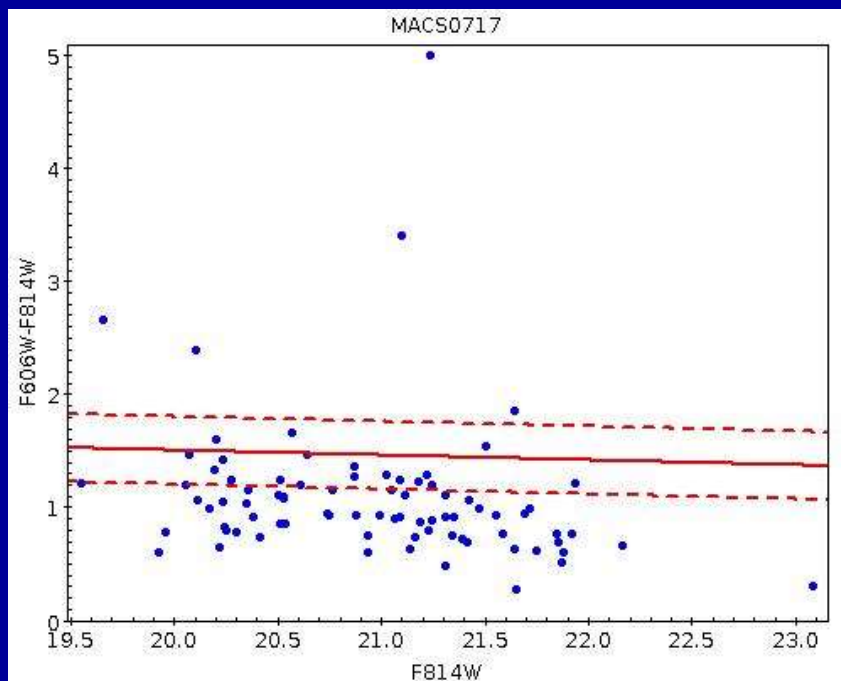
F606W

F814W

10 kpc

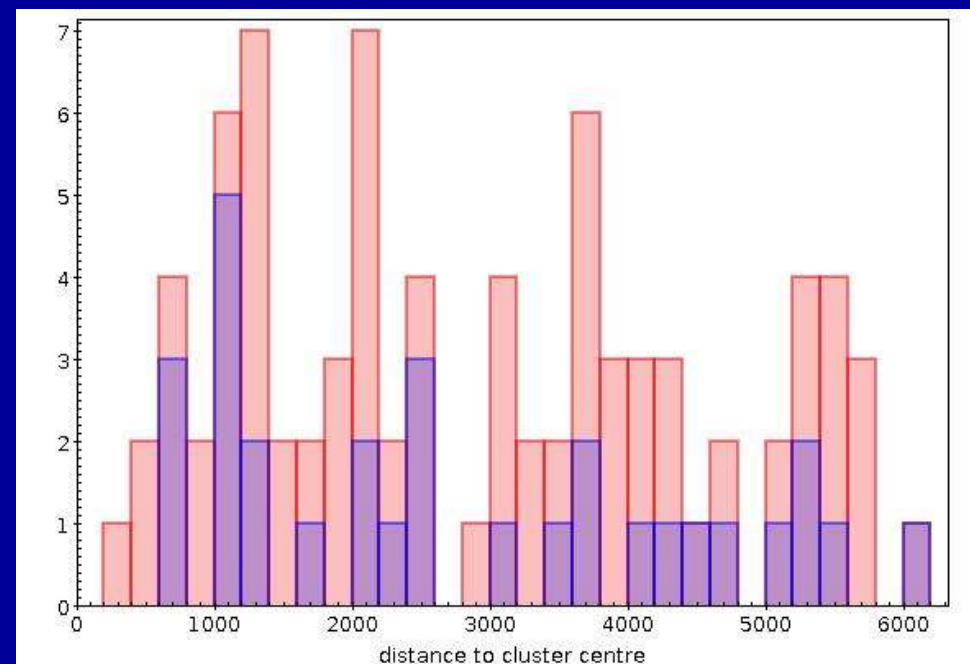
Properties of the 84 jellyfish candidates

They are mainly
blue galaxies



colour-magnitude diagram

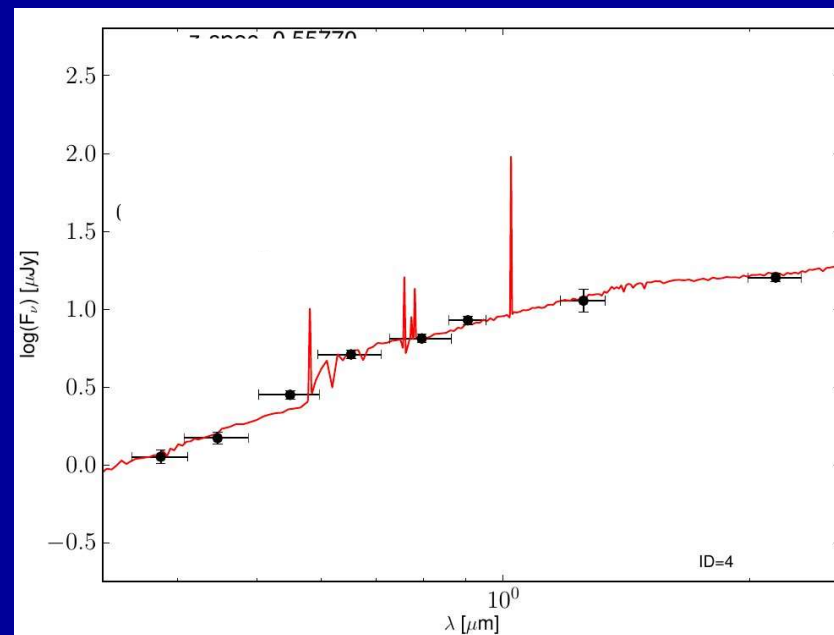
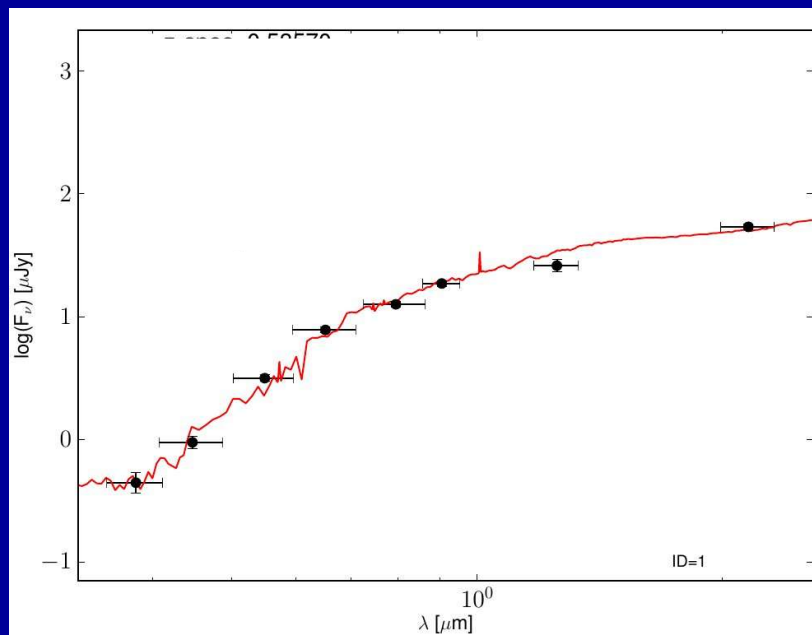
They are spread over
the entire region



distance to cluster centre

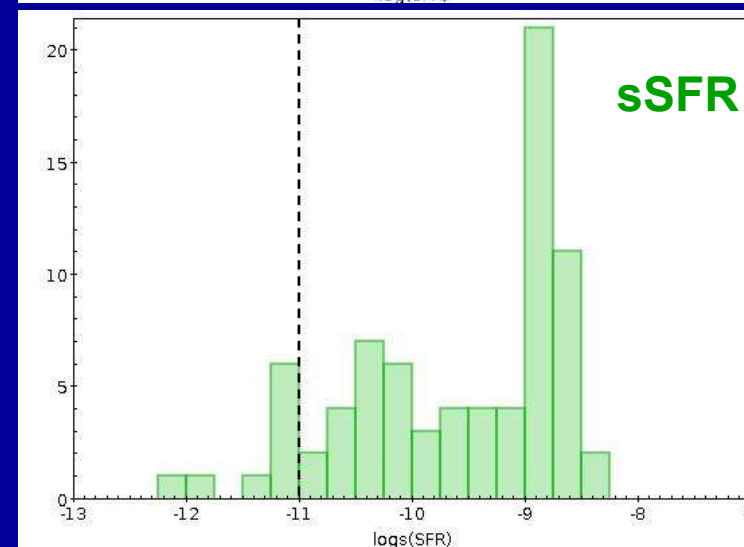
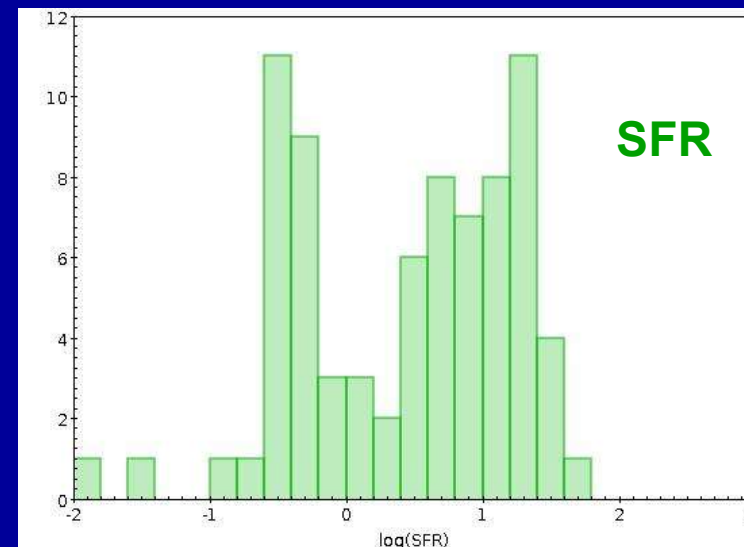
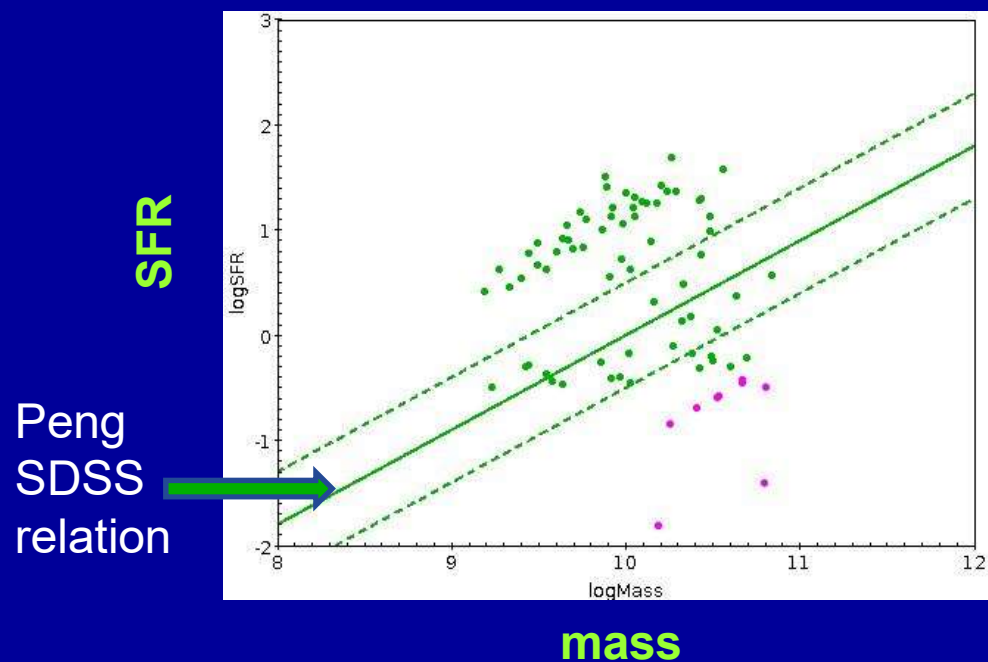
Stellar populations of the 84 jellyfish candidates

Fit of stellar population with LePhare (GAZPAR)

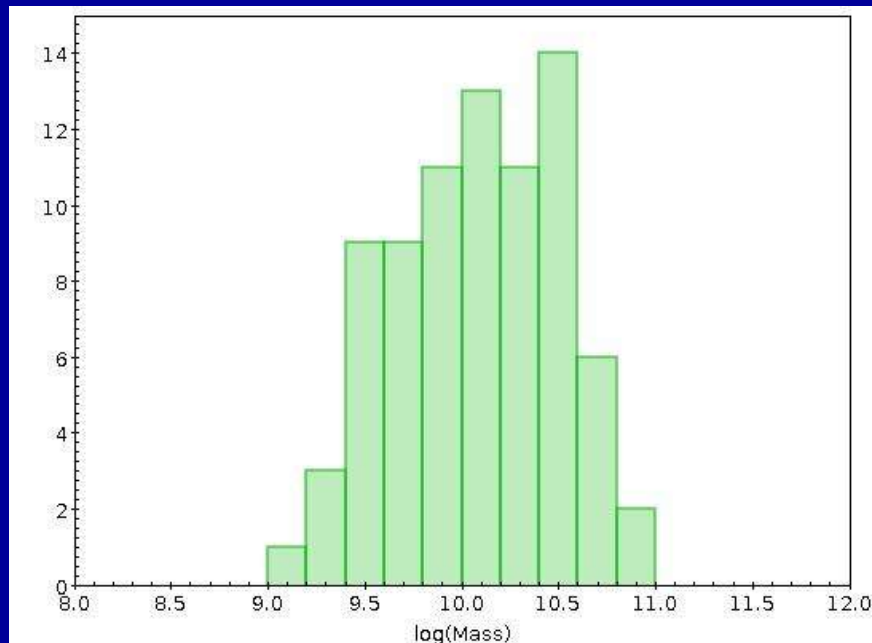


Stellar populations of the 84 jellyfish candidates

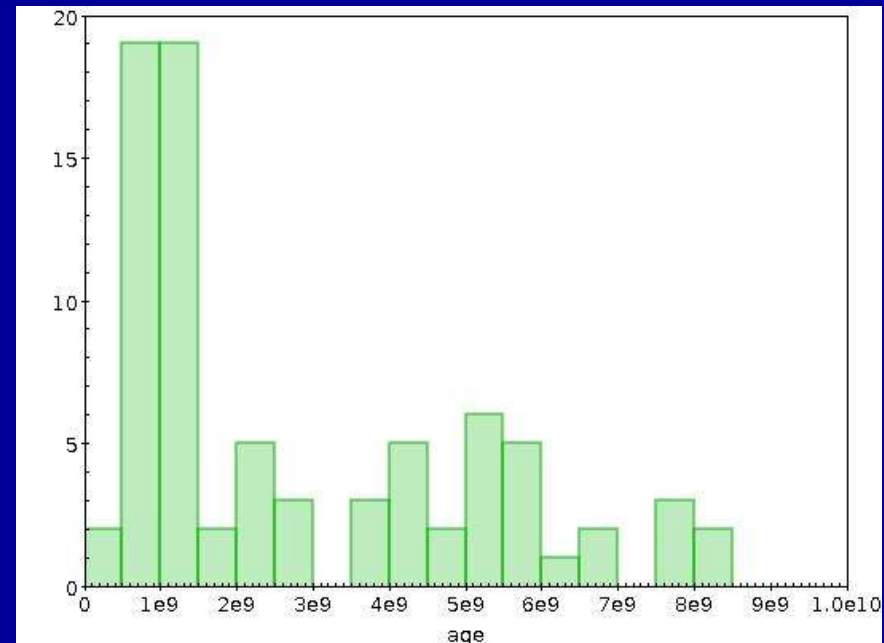
A large fraction has high SFR and sSFR



The jellyfish candidates have masses between 10^9 and $10^{11} M_{\text{solar}}$ and ages mainly $< 1.5 \times 10^9$ yrs



mass



age

Conclusions

- Difficult to identify jellyfish galaxies
- 103 jellyfish candidates also detected in 23 clusters ($0.2 < z < 0.9$)
- Jellyfish galaxies give informations on the cluster dynamics
- Study of another cluster is beginning