

Jellyfish galaxies and AGNs with HSC, DESI and PFS

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Jellyfish galaxies are the most extreme cases of galaxies undergoing ram pressure stripping, and a possible link between them and AGN triggering has been suggested in the literature. We use HSC images and DESI spectra to search for jellyfish candidates and AGN hosts.

Galaxies residing in dense environments like clusters, groups, and filaments may undergo ram pressure stripping (RPS), losing gas from their disks (Gunn & Gott, 1972). In extreme cases, this results in asymmetric structures, resembling tentacles, known as "jellyfish galaxies" (Poggianti et al., 2017). RPS significantly influences galaxy evolution by potentially stripping most of a galaxy's gas, quenching its activity (Larson et al., 1980), yet it can also intensify star formation rates (SFR) during the process (Vulcani et al., 2020). Some studies suggest that stripping might trigger AGN activity, although it is still in debate (Peluso et al., 2023; Roman-Oliveira et al., 2019).

The distinct jellyfish morphology is primarily evident through the H α emission. Our initial search targeted objects identified as probable H α -emitters within the HSC-SSP data release 2. Specifically, we narrowed our selection to galaxies falling within the redshift range of $0.23 < z < 0.26$. This range ensures that the H α and [N II] lines align within the NB816 narrow band. To improve accuracy, given the uncertainty of photometric redshifts, we exclusively considered galaxies with spectral observations in DESI. Our resulting sample comprises over 200 H α -emitters, and our ongoing efforts are concentrated on pinpointing jellyfish galaxies and identifying AGN hosts among them. For that we are using the zooniverse for image classification, as well as BPT diagrams (Baldwin et al., 1981) and WHAN diagrams (Cid Fernandes et al., 2011).

References

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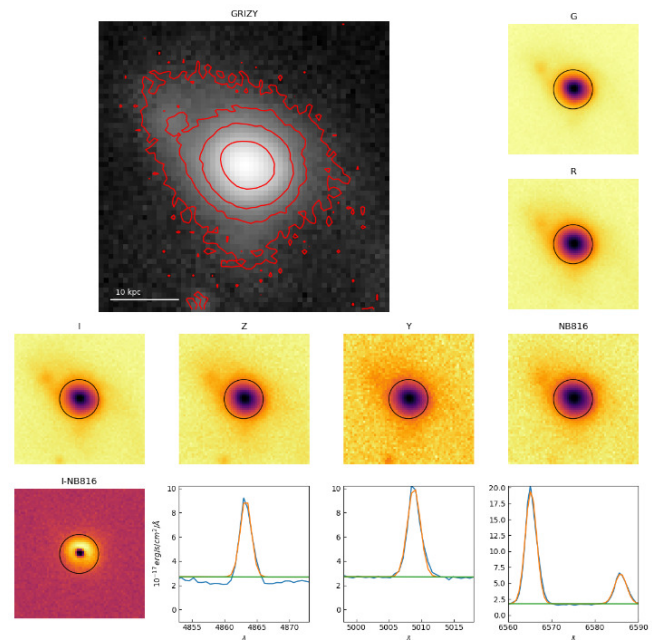


Figure 1. A stripping candidate in the ELAIS-N1. The multiple smaller figures show the fluxes in different HSC filters. The black circle in those stamps indicates the DESI's fiber aperture. The 3 graphs in the lower right show zoomed regions of the DESI spectrum of the emission lines H β , [O III] λ 5007, H α and [N II] λ 6583, respectively.

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