Exploring the AGN-ram pressure stripping connection

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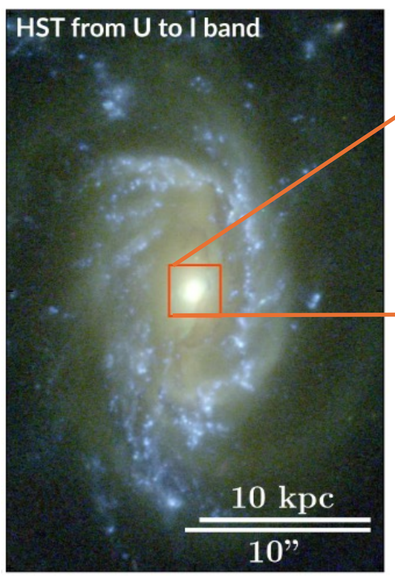
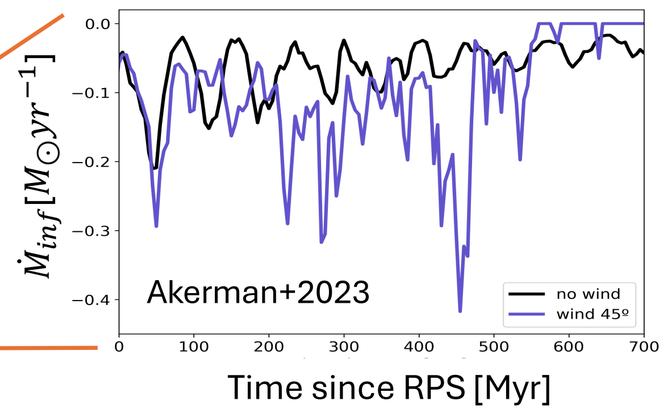
INTRODUCTION

Hydrodynamical simulations predict that the **ram-pressure stripping (RPS) phenomenon is able to push gas inflows towards galaxy's centers**.

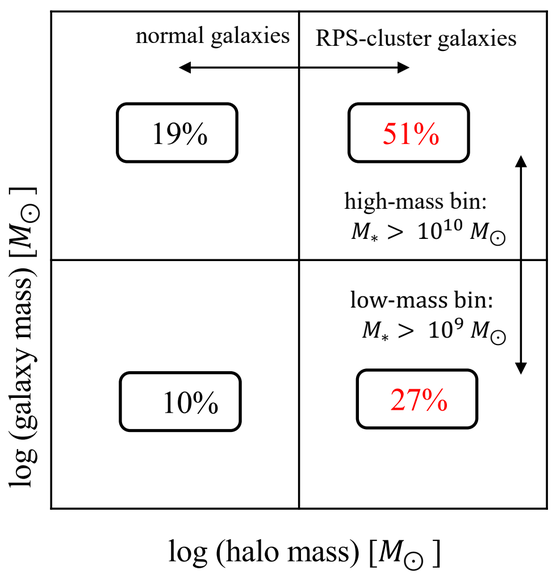




The purple line shows the predicted mass inflow rate (M_{inf}) as a function of time in the inner 3 kpc x 3kpc of JO201, in which the intra-cluster medium's wind is hitting the galaxy disk at an angle of 45˚. The excess with respect to the case with no wind is clear.

Open question: does RPS trigger Active Galactic Nuclei (AGN) activity?

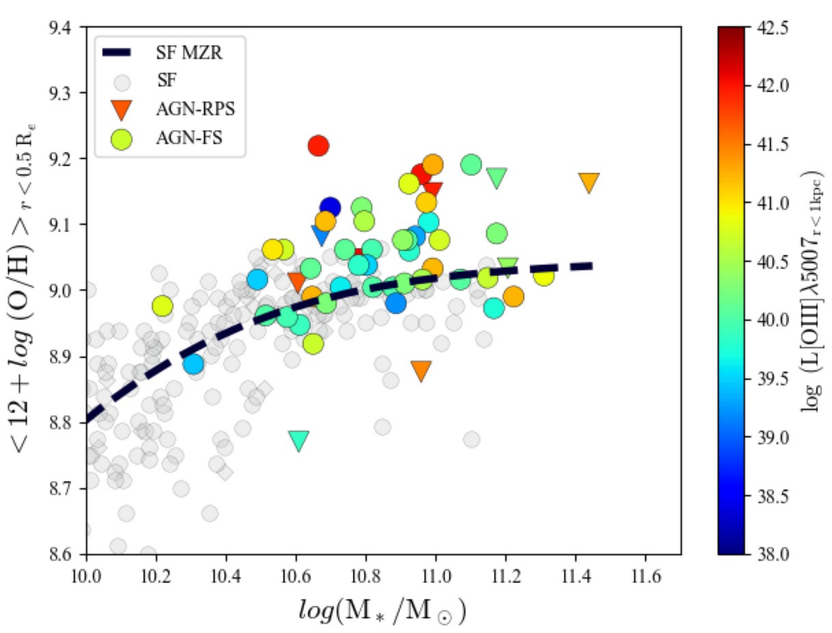
AGN fraction computed in the mass-matched samples



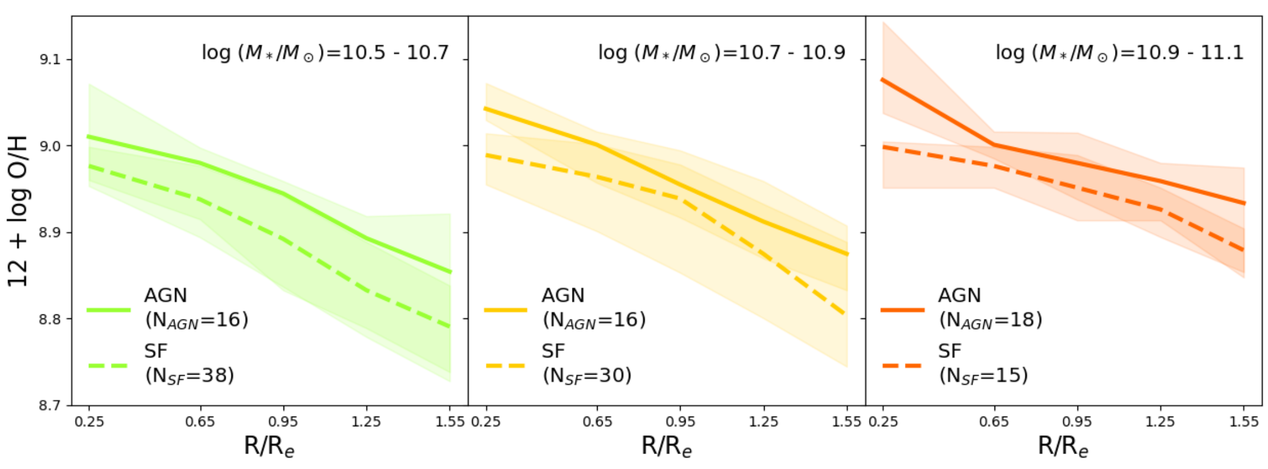
Peluso+2022 found an **enhanced AGN fraction (at z < 0.1) in 115 RPS galaxies**, with respect to the AGN fraction in a mass-matched control sample of 782 galaxies, in field and not affected by RPS.

Scan here for the article!

Scan here to see Peluso+2023!



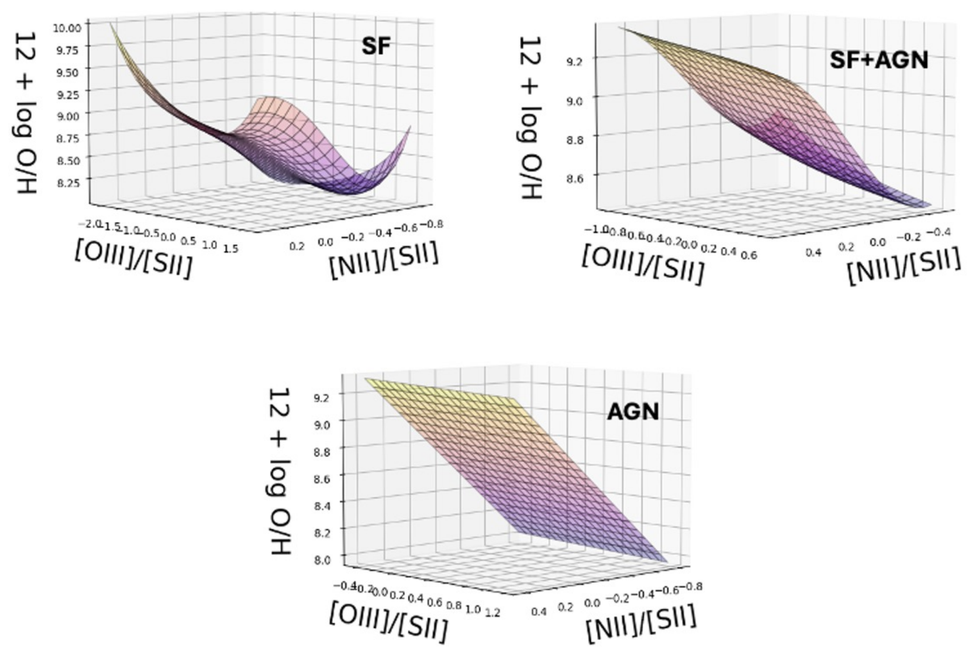
In **Peluso+2023**, we did not observe effects induced by the RPS on the gas oxygen abundances (12 + log O/H) of AGN hosts. Particularly, we estimate the gas-phase metallicity of the nuclear regions and the mass-metallicity relation of galaxies at z ≤ 0.07 and with stellar masses log M∗/M⊙ ≥ 9.0, either experiencing RPS or not. We find that **AGN hosts in clusters (AGN-CS) and in field (AGN-FS) lie on average above the star-forming mass-metallicity relation (SF-MZR), regardless from the galaxy's environment**. Thanks to a new spatially resolved study (Peluso+in prep.), we also show that the metal enhancement in AGN hosts, with respect to SF galaxies, is limited to the very inner regions (e.g. $r < 0.3\ R_e$, where R_e is the galaxy's effective radius), thus is actually tracing the effect of the AGN activity on the surrounding gas.



A new question arises: does the interplay between RPS and AGN activity affect the metal content in galaxies?

No!

What's next?



We will release **a new tool kit of calibrators** (which are equations describing the surfaces above) to measure the gas-phase metallicity, in an easy and computationally cheap way, in regions ionized by AGN, SF and a mixing of both (AGN+SF). These calibrators will allow to **extend the metallicity analysis on larger galaxy samples.**

Bibliography : Akerman+2023, ApJ, 948, 18; Peluso+2022, ApJ, 927 130P; Peluso+2023, ApJ, 958, 147P