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research highlights

GALAXY MERGERS

No link to active galaxies?

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Galaxy interactions are often attributed an important role in the growth of galaxies, under the paradigm of a hierarchically evolving Universe. Carolin Villforth and collaborators investigated whether galactic mergers are indeed important for triggering efficient accretion onto supermassive black holes, manifested in active galaxies.

The team used data from the Hubble Space Telescope to examine the morphologies of twenty X-ray emitting active galaxies with high bolometric luminosity ($>10^{45}$ erg s^{-1}), along with a control sample of non-active galaxies of similar stellar mass and redshift. Through visual inspection and quantitative analysis of their morphologies, the authors compared the fraction of sources with signs of past, ongoing and future mergers in these two samples. They found no significant differences between active and non-active galaxies for any of the considered categories of merger evidence.

This result poses an interesting conundrum, as the highest luminosity active galaxies have long been considered to be products of violent mergers that supply the copious amounts of gas needed to feed them. A substantial time delay between a merger event and the triggering of nuclear activity would explain these results but this hypothesis in turn leads to a different set of problems. More likely, however, is that active galaxies are triggered by a combination of minor mergers, which do not leave strong morphological imprints, and secular processes, such as gas accretion from their environments.

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