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MARE: MAvis for RElics

Relic galaxies, i.e., massive (> 5 * 10^10 solar masses), compact (sizes < 2 kpc) and old galaxies which have formed most of their stars in a short time are the remnants of high-z red nuggets. Most of the high-z galaxies are supposed to merge with smaller companions and systematically increase their size becoming the big monsters in the local Universe. But, due to the stochastic nature of galaxy mergers, few of them should survive untouched for their entire live, these are the relics. The time is finally come: although extremely rare, it is now possible to find them and study their properties in very details. They will provide a unique look at the high-z red nuggets, the stellar populations in the cores of the largest local galaxies and the role of mergers and environment on the evolution of the most massive and passive galaxies.

Thanks to a multi-facility program relying on wide-field photometric data from KiDS+VIKING, low-reolution spectroscopy obtained with different telescopes, and finally the high-resolution XShooter@VLT spectra within the INSPIRE project, we are now increasing the number of known relic galaxies. In particular, the INSPIRE DR1 catalogue consists of 10 relics, which augment by a factor of 3.3 the total number of confirmed relics (only 3 in the local Universe), also enlarging the redshift window up to z = 0.4. However, the spatial resolution of XShooter and similar facilities is not sufficient to resolve ultra compact objects such as the ones we have targeted.

The situation will become still more complicated in the future, when these samples of relic galaxies will be enlarged thanks to the upcoming optical and near-infrared wide-field sky surveys exploited by ground-based facilities (Rubin) and from space (Euclid). With the project **MAvis for RElics (MARE)** we aim at observing relic galaxies with MAVIS. Therefore, MAVIS will represent a unique instrument to obtain high-spatial resolution imaging and spectra, resolving such ultra-compact relic galaxies and constraining their stellar populations in terms of the galactocentric radius, providing a firm constraint on the physical processes driving the evolution of the most massive galaxies in the Universe.

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