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AGN feedback in groups

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Our understanding of how active galactic nucleus feedback operates in galaxy clusters has improved in recent years owing to large efforts in multiwavelength observations and hydrodynamical simulations. However, it is much less clear how feedback operates in galaxy groups, which have shallower gravitational potentials. We present recent observational work using a combination of eROSITA and MeerKAT (+ other radio) observations to study feedback processes in groups.

Among other things, we find that (i) galaxy groups are more likely than clusters to host large radio galaxies and (ii) that clusters and groups follow the same correlation between X-ray and radio emission.

In one particularly interesting case, we image the evolution of multiple generations of cosmic-ray active-galactic-nuclei bubbles in a galaxy group with LOFAR observations below 200 MHz. After hundreds of million years, the bubbles still have not fully mixed with the thermal gas, probably under the action of magnetic fields. This has implications for simulations of AGN feedback and we present new MHD simulations that attempt to reproduce our observations.

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