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Cluster Palaeontology in Abell 3266: Fossils, Relics, and Remnants revealed by EMU and the ATCA

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Clusters of galaxies provide ideal physical laboratories for studying a wide range of physical processes associated with hot gas (thermal components) and magnetic fields (non-thermal components). However, studying cluster magnetic fields in detail is difficult, due to the wide variety of physical processes undergone by clusters during their lifetime. Diffuse radio sources (such as the canonical relics and haloes) and tailed radio galaxies (which are frequently found in clusters) can provide key signposts to these physical processes, and thus help us understand the magnetic field topography. Abell 3266 is a rich, Southern cluster undergoing a particularly complex merger event, and as such provides a golden opportunity to study the thermal and non-thermal properties of the intracluster medium (ICM) on a broad variety of scales. In this talk, I will present the results of new, deep radio observations performed with the Australia Telescope Compact Array (ATCA) and Australian Square Kilometre Array Pathfinder (ASKAP). These observations reveal a plethora of previously-unseen diffuse, steep-spectrum radio sources associated with the ICM; additionally, we detect a multitude of active and remnant radio galaxies that are now resolved in unprecedented detail. Using our exquisite new radio data in conjunction with X-ray observations from XMM-Newton and eROSITA, I will discuss the properties of these newly-discovered sources, and what we can learn from them – both about their nature and the dynamical history of Abell 3266 – as well as what this means for upcoming cluster surveys with ASKAP.

Research area

Extragalactic Continuum (galaxies/AGN, galaxy clusters)

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