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Untangling the Magnetic Field of the Giant Radio Galaxy ESO422-G028 with Australian SKA Precursors

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The role played by magnetic fields is one of the key pieces of the puzzle to completing our understanding of the evolutionary picture of radio galaxies. These sources play a crucial role in driving the evolution and chemical enrichment of the Universe, through feedback processes. The largest radio galaxies - known as giant radio galaxies - typically reside in poor groups or clusters, thought to trace the warm-hot intergalactic medium (WHIM), where a significant portion of the missing baryon fraction of the Universe is thought to reside. Thus, by studying the magnetic field structure of these giants, we can probe the magnetic field in the large-scale structure of the Universe.

In this talk, I will present the results of a multi-wavelength campaign to understand the evolutionary picture of one such giant, ESO422-G028. We possess a spectacular radio dataset from a suite of cutting edge radio telescopes spanning the frequency range 88 MHz to 50 GHz. I will discuss what these data tell us about the large-scale magnetic field structure of ESO422, interactions with its surrounding environment, and how the small-scale structure of the radio core relates to the large-scale diffuse radio emission from the lobes.

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