

Title

Investigating the Scarcity of X-shaped Radio Galaxies: Distinct Origin or Detection Constraints?

Abstract

The expected straight-line trajectory of extragalactic jets can bend from their predetermined path, generating X-shaped radio galaxies (XRGs) when the two jets bend in opposite directions, forming inversion symmetric jets. Despite the discovery of such sources in wide surveys, the fraction of these sources among radio-loud AGNs remains low. To understand their scarcity, recent studies using modern radio telescopes with improved sensitivity and resolution have revealed that candidate XRGs, which previously showed hints of off-axis emission, likely possessing prominent extended wings. This suggests that we may have been overlooking the right candidates. However, the discovery of such cases remains only a handful, as it requires dedicated source studies with contemporary radio telescopes, rather than relying on shallow surveys. This proposal focuses on carefully selected southern-hemisphere candidate XRGs to be observed with MeerKAT telescopes. A total of five sources are proposed for observation, requiring 13.09 hours of telescope time in UHF band in full-polarisation mode. This novel study aims to determine whether XRGs are more common than previously thought or if they are formed through unique processes, making them distinct probes.