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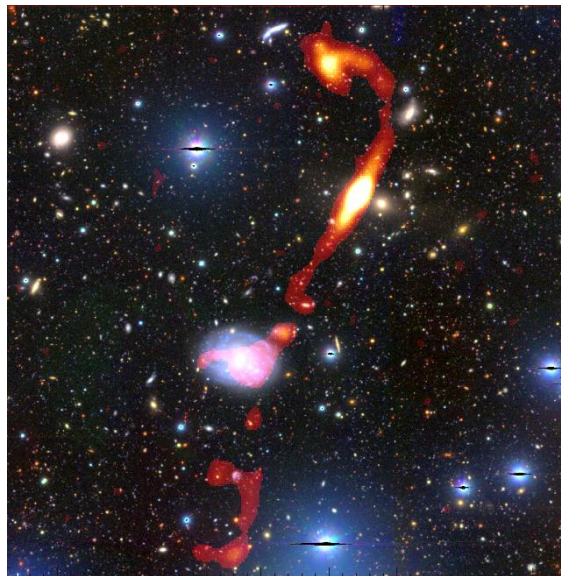
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UCT contributes to groundbreaking discovery of cosmic beast by MeerKAT telescope

UCT researchers help Unveil the giant radio galaxy 'Inkathazo,' offering new insights into the evolution of the universe



The newly discovered giant radio galaxy 'Inkathazo'. The glowing plasma jets, as seen by the MeerKAT telescope, are shown in red and yellow. The starlight from other surrounding galaxies can be seen in the background. Photo: K.K.L Charlton (UCT), MeerKAT, HSC, CARTA, IDIA.

The University of Cape Town (UCT) researchers and South Africa's MeerKAT radio telescope have made a monumental discovery of a rare giant radio galaxy, "Inkathazo," helping astronomers further understand the largest structures in the universe. This groundbreaking [study](#), published on Monday, 20 January 2025 in the *Monthly Notices of the Royal Astronomical Society*, features contributions from researchers and scientists worldwide.

Giant radio galaxies (GRGs) are extraordinary cosmic phenomena—massive galaxies emitting plasma jets millions of light-years across intergalactic space, powered by supermassive black holes at their centres. While previously considered rare, a surge of GRG discoveries has

been made possible by cutting-edge telescopes like MeerKAT, transforming the understanding of these cosmic behemoths.

“The number of GRG discoveries has absolutely exploded in the past five years thanks to powerful new telescopes like MeerKAT,” said Kathleen Charlton, a Master’s student at UCT and the first author of the study. “Research into GRGs is developing so rapidly that it’s becoming hard to keep up. It’s incredibly exciting!”

The discovery of *Inkathazo* is particularly significant as it has revealed an unusual giant radio galaxy with plasma jets extending 3.3 million light-years, more than 32 times the size of the Milky Way. The name *Inkathazo* means “trouble” in isiZulu and isiXhosa, and Charlton said it was chosen because the galaxy’s features have posed challenges for researchers attempting to understand its peculiar physics.

“It doesn’t have the same characteristics as many other giant radio galaxies,” said Charlton. “For example, the plasma jets have an unusual shape. Rather than extending straight across from end-to-end, one of the jets is bent.”

The researchers used MeerKAT’s advanced capabilities to create high-resolution spectral age maps of *Inkathazo*, which track the age of the plasma jets across different regions. These maps revealed unexpected energy boosts in the electrons within the jets, likely caused by collisions with hot gas between galaxies in the cluster. This discovery challenges existing plasma physics models and highlights the complexities of these extreme cosmic objects.

Dr Jacinta Delhaize, a researcher at UCT and part of the team who led the 2021 publication, emphasised the importance of MeerKAT in these discoveries. “The fact that we unveiled three GRGs by pointing MeerKAT at a single patch of sky goes to show that there is likely a huge treasure trove of undiscovered GRGs in the southern sky,” she said.

MeerKAT, operated by the South African Radio Astronomy Observatory (SARAO), has proven to be a revolutionary tool for exploring the southern sky. As a precursor to the Square Kilometre Array (SKA), it offers unmatched sensitivity and resolution, making it a key player in uncovering cosmic mysteries like *Inkathazo*.

“We’re entering an exciting era of radio astronomy,” said Dr Delhaize. “While MeerKAT has taken us further than ever before, the SKA will allow us to push these boundaries even further and hopefully solve some of the mysteries surrounding enigmatic objects like giant radio galaxies.”

This discovery underscores the critical role of South Africa and the University of Cape Town in advancing our understanding of the Universe and reinforces the importance of cutting-edge research and collaboration in unravelling the mysteries of the cosmos.

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