

Feeding the giant: detecting the source of the inflow into the Giant Radio Galaxy ESO 422–G028

Abstract

Giant Radio Galaxies (GRGs) are radio galaxies with exceptionally large sizes, giving important clues as to the life cycles and triggering mechanisms of active galactic nuclei. In particular, the long lifetimes implied by their large sizes raise questions as to the processes by which they are fuelled. With jets nearly 1.6 Mpc in extent, ESO 422–G028 is a nearby GRG in which an inflow of neutral gas has been detected via the optical Na D absorption line. The inflow appears to have triggered star formation in the elliptical host galaxy, and may be responsible for the newly reborn pc-scale jets emerging from the nucleus. We propose to observe ESO 422–G028 with MeerKAT in order to determine the source of the inflow. With its excellent sensitivity and large field-of-view encompassing the entire radio source, MeerKAT observations of H I in both emission and absorption will reveal the gaseous environment of this GRG, and enable us to determine whether the inflow originated in a low-metallicity, pristine stream of cold gas from the intragroup medium, or a gas-rich merger.