

Title

**Driving Rapid Galaxy Evolution Via Mergers: The Dramatic Luminous Blue Compact Galaxy ESO 400-43**

Abstract

Galaxy mergers drive rapid evolution, impacting properties like star formation, gaseous and stellar distributions, and material cycling between galaxies and the IGM. Studying these processes in  $z \sim 0$  galaxies is crucial for understanding the high-redshift universe, where detection relies on the Lyman-alpha emission line. HI kinematics significantly influence the escape of Lyman-alpha and Lyman continuum photons, making Lyman-alpha-emitting galaxies in local mergers critical observational targets. We propose HI imaging of the luminous blue compact galaxy ESO400-43, which is interacting with a star-forming companion. MUSE IFU observations, HST UV-NIR images, and shallow VLA HI maps reveal remarkable physical properties. The optical body shows a cometary morphology with complex ionized gas kinematics and a loop of low-surface brightness ionized gas extending toward the companion. Hundreds of star clusters and widespread Wolf-Rayet features indicate violent star formation within the past  $\sim 100$  Myr. A bridge of low surface brightness stellar emission connects the merging galaxies. MeerKAT observations will provide an unprecedented view of HI in this merging system. The primary science goal is to constrain which of two mechanisms plays a dominant role in shifting the HI out of resonance with Lyman-alpha : i) mechanical feedback from massive star winds and SNe or ii) bulk motion resulting from interactions and mergers. We will accomplish this by undertaking a detailed study of the HI kinematics, particularly along the sightline of the measured Lyman-alpha profile. Secondary goals include mapping low column density HI and a comparative study of HI with the ionized gas and stellar components.