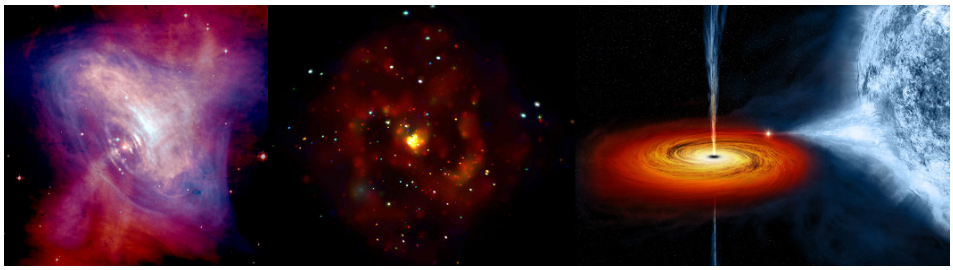

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Study of Hybrid Morphology Radio galaxies identified from VLA FIRST survey at 1400 MHz

Wednesday, April 5, 2023 2:40 PM (10 minutes)

Hybrid Morphology Radio Galaxies (HyMoRS) are found to be very rare subclass of radio galaxies. HyMoRS exhibits differing Fanaroff & Riley morphologies (FR I/II) in each of the two lobes. FR-I jets are generally shorter, have a high proportion of entrainment of thermal plasma close to the core region of the galaxy. On the other hand, FR-II radio galaxies are much extended (in the order of Mpc), luminous and have compact hotspots at the exterior edge of the structure. We identified 33 HyMoRS, the biggest sample found to date, with the help of the VLA FIRST survey at 1400 MHz. The majority of HyMoRS in our published article have steep radio spectral indices, as expected for typical lobe-dominated radio galaxies. The typical spectral index of normal radio galaxies is 0.70, which is the same as the average spectral index of our identified 33 HyMoRS. This suggests that, statistically, there is no difference in comparison to normal radio galaxies with HyMoRS. The average log L for reported sources is 25.30, which is near the borderline luminosity of FR-I and FR-II sources as expected due to the mixed morphology (FR-I and FR-II) of HyMoRS. The reasons for the unique nature of HyMoRS are still not known. It is believed that the asymmetric environment close to the host galaxy (difference in the nature of the central engine and/or the composition of the jets) and orientation are the main causes of this morphology of radio galaxies. Multi-wavelength follow-up observations are encouraged to comprehend the detailed nature of HyMoRS.

Presentation Type

Oral

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