Gas dynamics in Seyfert galaxies: Probing Supermassive Black Holes Feeding and Feedback

Estelle Salibur (*estelle.salibur@orange.fr*)

Intern at *Laboratoire d'étude de l'Univers et des phénomènes eXtrêmes, Observatoire de Paris*

Active Galactic Nuclei (AGNs) are compact, luminous regions at the centers of galaxies, powered by the accretion of matter onto supermassive black holes (SMBHs), and characterized by non-thermal emission across the electromagnetic spectrum. Understanding how gas loses angular momentum to feed the SMBH and how AGN-driven feedback regulates host galaxy evolution is crucial for constraining galaxy evolution models. Kinematic analyses offer a way to probe these processes, yet projection effects, particularly in barred galaxies, complicate the interpretation of radial motions, making it difficult to distinguish between inflows and outflows. In this work, I study the circumnuclear gas dynamics in Seyfert galaxies using high-resolution ALMA observations of cold molecular gas, combined with JWST infrared data tracing dust emission. After assessing the limitations of kinematic modeling tools such as 3D-Barolo, especially their sensitivity to projection effects, I adopt a multi-wavelength approach to cross-validate radial motions with independent observational tracers. This strategy allows for a more reliable identification of gas inflow and outflow, and a better understanding of the SMBH-host galaxy co-evolution.