A screenshot of a computer

Description automatically generated with low confidence

Link: <https://arxiv.org/pdf/2011.04677.pdf>

Radio-loud galaxies with AGN-powered jets have the potential to affect their host galaxy’s environment by generating powerful outflows of high-velocity gas. These outflows can significantly disrupt the ISM on scales comparable to the galaxy’s halo and may therefore represent a critical period in galaxy evolution in which an AGN in a radio phase can drive significant evolutionary change by affecting the gaseous content of the galaxy. However, observations of radio galaxies often focus on probing the cold, molecular gas that traces star formation and ignore the warm, shock-ionized gas that form AGN ionization cones which can offer a more direct view into the extreme morphological and kinematic impact of the jet on the galaxy’s ISM. We propose to conduct MUSE observations of the optically-emitting warm, ionized gas in four identified radio galaxies observed to have small-scale radio jets (IC 5063, NGC 5643, NGC 1068, and NGC 1386). The integral field spectroscopy enabled by MUSE will allow us to investigate the morphology and kinematically map the ionized gas to see whether AGN cones are present. By comparing their alignment and orientation to the radio jet, we will be able to directly probe for jet-induced feedback. Our project will also shed light on the cosmological simulations that show that radio jets do indeed provide a dominant source of feedback on sub-kiloparsec scales, but that have yet to provide answers as to the potential impact that AGN-induced jets may have on the galaxy’s large-scale gaseous environment, subsequently driving the evolution of galaxies.