

A comparative FIR study of radio loud and radio quiet AGN

Supervisor: José Afonso (jafonso@oal.ul.pt)

Abstract: One of the most important phases in the evolution of a galaxy is that when the galaxy hosts an Active Galaxy Nuclei. The infall of matter to a supermassive black hole in the center of a galaxy, often accompanied by intense starformation which is expected to be terminated by the AGN action itself at some point, is a complex phenomena still poorly understood. In particular, there appears to be an observational split between the so-called “Radio-Loud AGN”, where the ratio of radio to optical light is considerable, and the “Radio-Quiet AGN”, where the radio emission is small or even undetected. These AGN are arguably distinguished by different accretion modes, but the observational data hasn’t been able to provide a definite answer. Understanding the Radio-Loud vs. Radio-Quiet AGN problem is of fundamental importance to (a) understand the AGN phenomena itself; (b) predict what will be the outcome of the next generation of radio surveys currently being planned and (c) understand how to look for the highest redshift radio galaxies, the first AGN in the Universe that should already be detected by current deep radio surveys.

In this thesis, the student will look into the Far-Infrared properties of a large sample of Radio-Loud and Radio-Quiet AGN, using the deepest observations from the Herschel Space Observatory to characterise these sources. Their dust (mass, temperature, distribution) and star formation content, as well as the quantification of both the FIR and the radio emission from SF and AGN activity will be obtained. The results will then be used to predict the observability of very high redshift AGN in current and future deep radio surveys such as the EMU and WODAN.