

THE STARBURST - AGN CONNECTION: A CRITICAL REVIEW

P. Rafanelli, G. La Mura, D. Bindoni, S. Ciroi, V. Cracco

*Department of Astronomy, University of Padua, Vicolo dell'Osservatorio 3,
35122 Padua, Italy*

*E-mail: piero.rafanelli@unipd.it, daniele.bindoni@unipd.it, stefano.ciroi@unipd.it,
valentina.cracco@unipd.it, giovanni.lamura@unipd.it*

Nuclear activity and star formation processes represent two key elements in the evolution of galaxies across the cosmic ages. In spite of the very different physical backgrounds, several arguments suggest that they should be closely connected. On the basis of simple theoretical considerations, indeed, the transport of appreciable amounts of fuel to the AGN scale is very likely to trigger star formation in the gas. Young stellar populations, in their turn, are expected to affect the properties of the inter-stellar medium, leading to a complex balance of interactions among nuclear activity and star formation. This scenario is also supported by the observation of Super Massive Black Holes and host galaxy properties, which strongly suggest a common evolutionary track. However, despite several years of extensive investigation, the relationship among the two processes still has to be properly explained. Here we provide a careful review of some of the most important observations, which are relevant to the issue of the connection among AGN and starburst events. Based on a wide sample of observations, we present a careful analysis of the spectral signatures connected with AGN and star formation activity. Expanding the concept of the distinction among star forming galaxies and true active nuclei, we provide systematic evidence for a role of recent starburst events in the circum-nuclear regions of active galaxies and we discuss the possibility of its influence onto the AGN environment. We further analyze the age, mass, and metallicity properties of star forming and active galaxies, illustrating that they are arranged in a sequence that is consistent with the identified relation.