

# Distinguishing Between AGN and Star-Forming Galaxies in ATLAS

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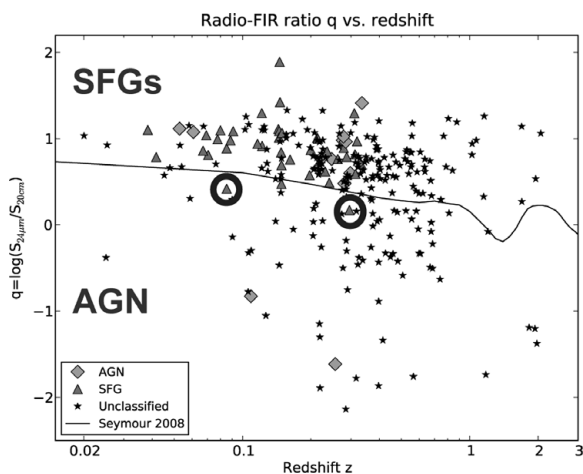
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The Australia Telescope Large Area Survey (ATLAS; Norris *et al.* 2006) is the widest deep radio survey to date, covering approximately 7 square degrees over two fields, with extensive complementary data. We are investigating all possible discriminants between active galactic nuclei (AGN) and star-forming galaxies (SFG) in ATLAS, to determine a robust formula for distinguishing the two.

To distinguish between AGN and SFGs, we plan to use all known indicators such as optical/infrared spectral energy distributions (SEDs), spectroscopic line ratios and widths, radio spectral indices, morphology and polarization, the radio-FIR correlation, variability and VLBI. We first classified sources as AGN or SFG by their location on a BPT diagram (Baldwin *et al.* 1981), before investigating source positions on the radio-FIR correlation and then the logarithmic FIR-radio flux ratio  $q$  (Figure 1) for all sources. Two sources optically classified as SFGs appear as AGN with this diagnostic, and similarly their radio spectral indices are indicative of AGN. We conclude that optical diagnostics, in combination with radio indicators and IR data, give us a powerful way to distinguish between an AGN, SFG or a composite source.



**Figure 1.** Radio to FIR flux ratio  $q$  vs. redshift for sources classified as SFGs on the BPT diagram, with spectral templates and AGN/SFG dividing line from Seymour *et al.* (2008). The circled sources are misclassified optically as SFGs.

## References

- Baldwin, J. A., *et al.*, 1981, *PASP*, 93, 5  
Norris, R. N., *et al.* 2006, *AJ*, 132, 2409  
Seymour, N., *et al.* 2008, *MNRAS*, 386, 1695