Starburst or Seyfert? Adding a radio and far-infrared perspective to the investigation of activity in composite galaxies

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This paper is dedicated to the memory of Charlene Heisler (deceased, 28 October 1999).

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abstract

It was once common to regard Seyfert and starburst galaxies as completely different types of object, but there is growing recognition that these classifications refer to the extremes of a continuous spectrum of galaxy types. In a previous study we investigated a sample of galaxies with ambiguous optical emission-line ratios and concluded from near-infrared spectroscopic observations that the sample consisted of composite galaxies, containing both a starburst and an active galactic nucleus (AGN). We now extend our study using radio synthesis and long-baseline interferometer observations made with the Australia Telescope, together with far-infrared IRAS observations, to discuss the relative contribution of starburst and AGN components to the overall luminosity of the composite galaxies. We find that only a small fraction of the radio emission (<10%) can be attributed to an AGN, and that the majority of the far-infrared emission (>90%) is probably due to the starburst component. We also show that an AGN contribution to the optical emission of as little as 10% is sufficient to account for the ambiguous line-ratio diagnostics.