NEAR INFRARED IMAGING OF THE MERGER CANDIDATE NGC 1052

DUNCAN A. FORBES
Institute of Astronomy
Madingley Road
Cambridge CB3 0HA, U.K.

NGC 1052 is a flat-spectrum radio elliptical exhibiting a characteristic low excitation LINER spectrum. Independent evidence, such as extensive and infalling HI gas, and misalignment of the stellar and ionized gas components, suggest a merger has occurred. Optical CCD imaging reveals the presence of dust and a spiral morphology for the H_α emission (see Forbes, Sparks and Macchetto 1990). The X-ray luminosity is consistent with a hot gaseous halo in which a cooling flow is claimed to be operating (Thomas *et al.* 1986).

Broad-band near infrared images at 0.3"/pixel were obtained using the SBRC 62 × 58 infrared array on the 4.0m telescope at CTIO in September 1989. Data reduction used standard procedures. Systematic errors dominate and are given by the rms deviation of the standard star measurements ($\sim$ 0.03 mag for J, H, K and 0.15 at L).

Near infrared emission is primarily dominated by cool late-type stars, although hot dust may contribute close to an active nucleus. The J, H and K images reveal a extended smooth distribution of old stars, with some evidence of reddening in a J-K map. The $r^{1/4}$ profile seen (Fig. 1) is similar to that of most ellipticals, and is consistent with violent relaxation of these stars since the merger ($\sim 10^9$ years ago). The L image is slightly extended beyond the seeing profile. Two colour diagrams reveal that NGC 1052 is slightly redder, especially in K–L, than normal galaxies (Willner *et al.* 1985). It is difficult to deconvolve the effects of various mechanisms in the two colour diagram, however the reddening seen in K–L, as we go to smaller apertures, appears to be due largely to the presence of hot dust (heated by a central source).

A variety of independent evidence strongly suggest that NGC 1052 has undergone a merger, near infrared imaging is consistent with this idea. The origin of the emission-line gas is therefore from a merger and not thermal instabilities from a cooling flow. The possibility that cool infalling gas from a merger can significantly modify the energy budget of the X-ray halo is being investigated by Sparks *et al.* (1990).

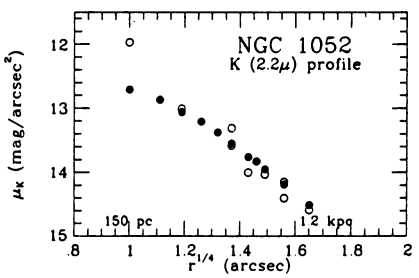

Figure 1. Multiaperture photometry at K (filled circles) reveals that these stars follow an $r^{1/4}$ profile at least out to 8" (1.1 kpc at a distance of 29.3 Mpc). Aperture photometry from the literature is shown for comparison (open circles).

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