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FAINT LIGHT IN CLUSTERS OF GALAXIES

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We are investigating the nature of the structures of low surface brightness (LSB) around and in the neighbourhood of galaxies, including extended haloes; filaments, tails and bridges of interacting galaxies; and diffuse light between galaxies in a cluster. We intend to combine long-exposure, high S/N observations of these galaxies and zones with sophisticated codes of stellar population synthesis.

The advent of fast scanning microdensitometers in the 70s and 80s facilitated the digitalisation, calibration and co-addition of wide-field photographic data from telescopes such as the UK Schmidt 1.2-m. Kemp & Meaburn (1991a) co-added digitally a 4×4 deg^2 region from 8 IIIaJ plates centred on the IC 4296 group of galaxies, with the aim of producing high contrast deep images of galaxies in the group and to study the intracluster medium. Results concerning all types of galaxies and intra-cluster medium may be found in Kemp & Meaburn (1991b, 1993, 1994) and Kemp (1994). Later, Katsiyannis et al. (1998, 2001) followed up this initial project by combining ~ 31 deg^2 from 13 Kodak Tech-Pan films of the Virgo cluster and discovered many new filaments, tails and bridges in the vicinity of interacting galaxies, in the cluster and in the background.

Now we are carrying out a follow-up project to attempt to quantify the nature and mass of the faint material detected and to investigate its contribution to the total baryonic mass of the universe. To this end we are obtaining CCD multicolour photometry, infra-red photometry, and optical spectroscopy of a large sample of interesting fields within the Schmidt data arrays referred to above, and of a large sample of cD galaxies (which we consider to be a good "laboratory" for the studies of LSB material); and input this data into the stellar population synthesis codes of M. Chávez and his collaborators to investigate the nature and mass of this faint material.

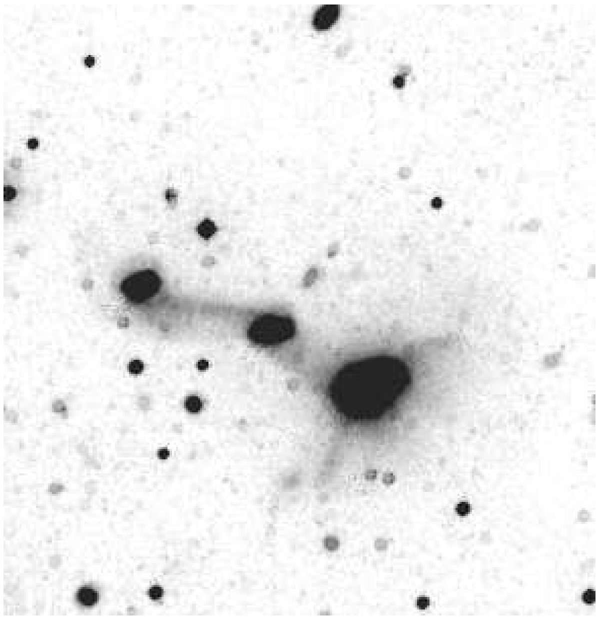

Fig. 1. Medium contrast image from the co-added Virgo data (Katsiyannis et al. 1998, 2001), showing NGC 4410A/B (two galaxies with common halo right centre of field) and their connections with two other galaxies

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