

A NEW RING GALAXY IN PISCES

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NGC 414 is found to be a binary elliptical galaxy in which the northern component is surrounded by a ring of diameter $8.9 h^{-1}$ kpc.

Key words: ring galaxies

A limiting IIIa-J + GG 385 plate taken in $\sim 3''$ seeing at the prime-focus of the Mayall 4-m telescope shows that NGC 414 = UGC 744 = IV Zw39 is a binary ring galaxy (see Fig. 1) which is not listed in previous catalogs of such objects (Ghigo 1980; Thompson 1977). The binary nature of this object was first noted by Zwicky (1971) and by Karachentsev (1972).

Zwicky describes the system as a "pair of neutral compacts in contact, blue plumes". Presumably Zwicky's "plumes" are part of the ring structure visible in Figure 1. The present monochromatic observations can neither confirm nor deny Zwicky's claim that the ring is blue.

Although no radial velocity is available for either of the components of NGC 414 itself (Rood 1980) it is almost certainly a member of a compact group of galaxies centered on NGC 410. For the latter object the redshift (corrected for solar motion) is 5445 km s^{-1} so that the distance to the group is $\sim 54 h^{-1}$ Mpc. With this distance the $34''$ diameter ring surrounding the northern component of NGC 414 has a linear diameter of ~ 8.9

h^{-1} kpc. The separation between the nuclei of the northern and the southern component of NGC 414 is $\sim 6''$ corresponding to $\sim 1.6 h^{-1}$ kpc.

Inspection of the figure shows that the morphology of the NGC 414 system is entirely consistent with a model (Lynds and Toomre 1976; Theys and Spiegel 1977) in which an intruding galaxy produces a ring-like density wave that develops as the target galaxy rebounds from the short-lived extra pull exerted during a central collision.

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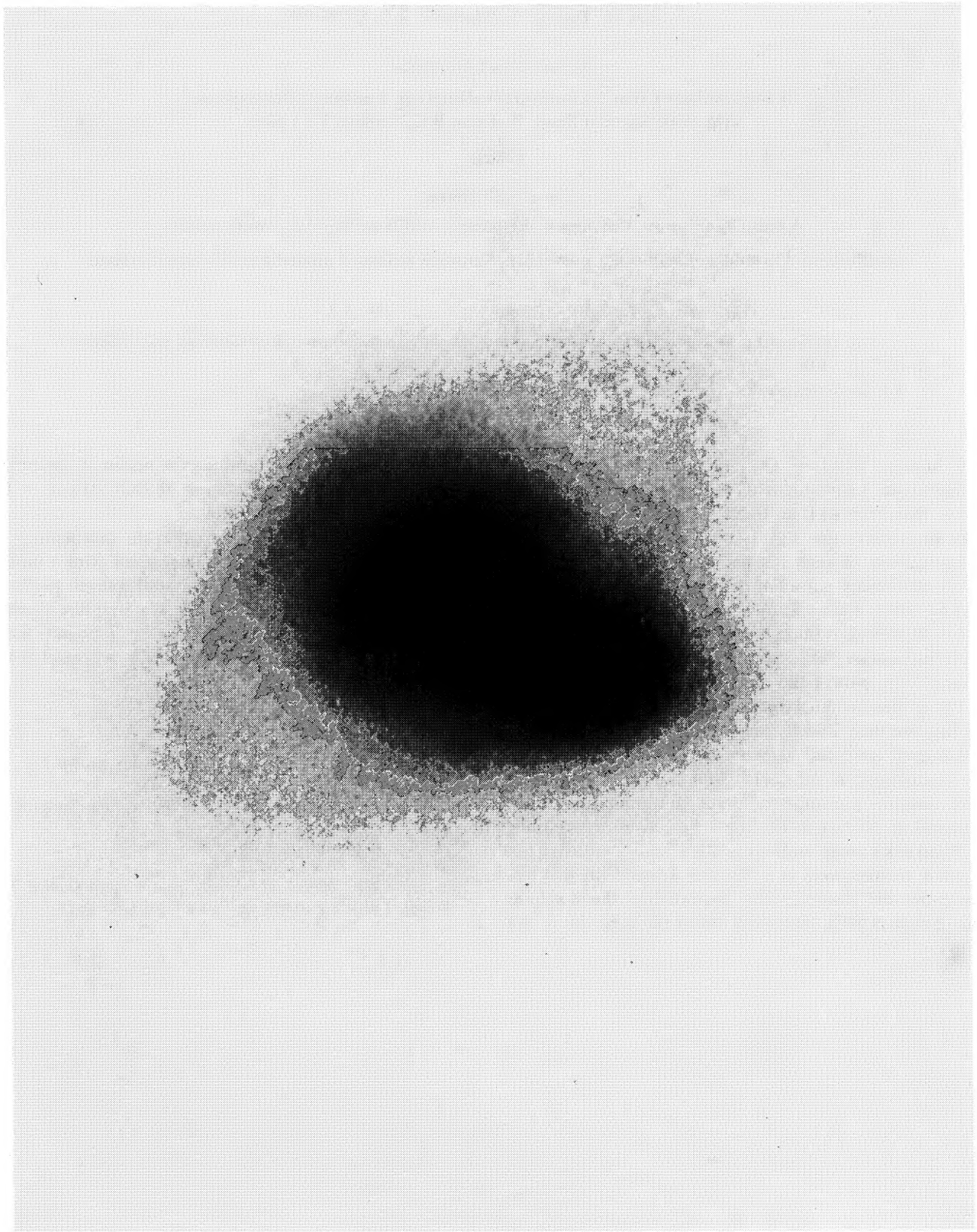


FIG. 1—III a-j plate of NGC 414 obtained with the KPNO 4-m telescope.