The results are given of spectroscopic observations of the galaxy III Zw 0834 + 51, which is situated to the north of Markaryan 94. It has the same red shift as Markaryan 94. A prime-focus photograph taken with the 200-inch Hale telescope shows that Markaryan 94 is located in an area of disordered spiral structure on the edge of the galaxy. It is concluded that Markaryan 94 is a superassociation belonging to III Zw 0834 + 51. Between the central region of the latter and Markaryan 94 a further compact formation is observed; it too is a superassociation or a very bright stellar association. The radial velocities of this compact object and the central region of the galaxy differ by more than 200 km/sec.

1. Introduction

In the second list of galaxies with ultraviolet excess, Markaryan [1] included object No. 94, which he classified as die. According to [1], the spectrum of this very compact object contains the strong emission lines Hβ, N1, N2, Hα, and A 3727 [OIII]. According to the observations of Sargent [2] and Arakelyan et al. [3] the red shift of Markaryan 94 is z = 0.0025, and the absolute brightness is of order $M_{pg} = -13.5$. This object is on the "periphery of a disordered spiral" [1], included in Zwicky's catalog [4]. In what follows we shall denote it by III Zw 0834 + 51.

It would be interesting to establish whether Markaryan 94 is connected physically to this galaxy. In [2] it was suggested that Markaryan 94 could be a giant H II region next to this galaxy.

In the present note, on the basis of spectroscopic observations, we present data indicating a physical connection between these two objects.

2. Observational Material and Results of Its Evaluation

The spectrum of III Zw 0834 + 51 was obtained on April 4-5, 1973 (plate No. Q 4099) by one of the authors (G.A.) using a Cassegrain spectrograph of the 200" Palomar telescope in conjunction with an image tube. The photograph was obtained on film of the type IIa-D with an exposure of 60 min and a dispersion of about 240 Å/mm. The spectrograph slit had the position angle 155° and was directed along the extension of the galaxy, which appears to be due to the presence of a relatively bright bar. A photograph of the spectrum is shown in Fig. 1.

As can be seen from Fig. 1, the spectrum has a very interesting form: on the background of the continuous spectrum, which is brighter at shorter wavelengths, one observes a very narrow and very faint Hα emission line. At a distance of approximately 15" from the continuous spectrum it becomes appreciably brighter, although it remains narrow, its width not exceeding the width of the night-sky lines. Outside the continuous spectrum one can also clearly see the lines N1, N2, and Hβ, which are situated at the same distance from the continuous spectrum as Hα. They are at the edge of the spectrum and are therefore slightly out of focus.
Fig. 1. Spectrum of III Zw 0824 + 51 and the compact condensation. The continuous part is the spectrum of the galaxy; the emission part is the compact condensations.

Fig. 2. Photographs of III Zw 0834 + 51, Markaryan 94, and the compact condensation between them (indicated by the arrow): a) 200" telescope, 103a–J, exposure 15 min; b) 40" Schmidt telescope of the Byurakan Observatory, 103a–O, exposure 15 min.

A superficial inspection of the photograph gives one the impression that on it there are two individual spectra: a continuous spectrum without bright lines and, outside it, a bright emission spectrum with the lines Hα, N1, N2, Hβ. The intensity of N1 is not less than that of Hα.

However, a careful examination shows that the bright part of Hα, which becomes rapidly fainter, reaches the continuous spectrum and actually continues to its other side.

It is interesting that on the direct photograph of this region obtained at the prime focus of the 200" telescope on April 3–4, 1973 (on Kodak 103a–J plates with 15-min exposure) one observes a fairly bright condensation, with a slightly extended form, at the position from which, according to the measurements, the bright emission part of the spectrum originates. It can be clearly distinguished on the background of the galaxy and has a length of order 4–5" (Fig. 2a). In the figure this condensation is indicated by the arrow. In the same figure we have indicated the position of Markaryan 94. To confirm that the condensa-