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ВЫПУСК I

OBSERVATIONS OF THE SUPERNOVA 1959 b IN NGC 4921

ROBERTO BARBON

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Photovisual and photographic observations of the supernova 1959 b in NGC 4921 are reported. The comparison with previous observations made in Byurakan seems in fair agreement with the existence of a flat maximum as shown by type III and IV supernovae.

The supernova, shown in Fig. 1, was found by M. Humason [1] on May 4, 1959 at $16''$ East and $48''$ South of the nucleus of the galaxy NGC 4921, a member of the Coma Cluster, at the position: R.A. = $12^{\text{h}} 59^{\text{m}}2$, Decl. = $+28^{\circ}7'$ (1950). The magnitude reported by Humason was

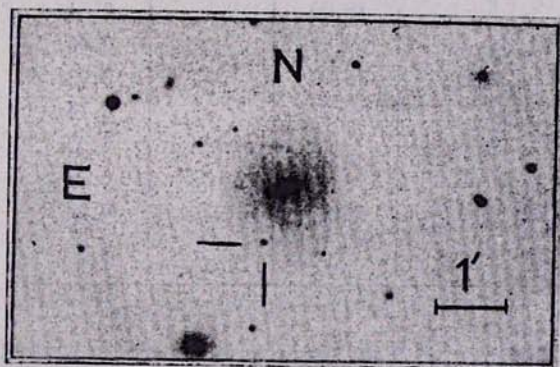


Fig. 1. The supernova in NGC 4921. Scale as indicated.

18.5 mag. Later on, Shakhbazian [2] announced that the supernova was visible in four plates taken at Byurakan with the $21''$ Schmidt telescope, in the prediscovery period between April 11 and May 3, 1959. Moreover

another plate, dating February 8 of the same year, showed the supernova at the apparent brightness of 18.5 mag. Shakhbazian suggested two hypotheses: a) the supernova was, on February 8, in the increase of its brightness, later exceeding the observed magnitude of 18.5. b) the supernova had a flat maximum lasting 2 or 3 months. The possibility of a bright maximum before February 8 and that all the observations refer to the fading period, was also presented.

In view of the above, the reduction of all the material still available appears worthwhile.

The supernova is visible in 13 plates taken with the 48" Schmidt telescope on Palomar Mountain during the two months following the discovery. All of the plates are Kodak 103a-D plus an amber filter, except two which are blue-sensitive 103a-O. S. A. 57, in which photoelectric magnitudes by Baum are available, is visible in the field of every plate; so it was easy to derive the magnitude of the supernova without

Table 1

Date	m_p	m_{pg}	M. E.
May 4, 1959	18.24		0.03
June 3, "	18.04		0.04
" 4, "	17.86		0.04
" 7, "	17.80		0.05
" 8, "	18.12		0.05
" 9, "	18.00		0.04
" 10, "	17.87		0.06
" 11, "	18.02		0.03
" 26, "	18.21		0.14
" 28, "		18.90	0.03
" 30, "		18.92	0.08
July 1, "	18.50		0.03
" 2, "	18.57		0.03

establishing secondary standard sequences. In every plate the brightness of the supernova was estimated four times by visual comparison with the standard stars, because the background light of the galaxy prevented the use of the photometer. The mean errors are shown in the last column of the following table in which the visual and the photographic magnitudes are reported. The reason for such a low error is easily understood by the fact we have the object and a well established stan-

standard sequence on the same plate. The plate of June 26 is rather poor so the derived magnitude must be considered fairly uncertain.

In Fig. 2, we plotted our magnitudes together with the Byurakan observations. Two of these latter ones, namely on April 11 and 12, are on Kodak OaE plates behind an orange filter and may be compared fairly well with our yellow magnitudes. According to Fig. 2, the resulting light curve is rather strange. The photovisual observations seem to be in fair agreement with the possibility of a flat maximum (as shown in supernovae of type III and IV, Zwicky [3],) lasting at least two months. Unfortunately no plate is available in the period February-April 1959, but if a bright maximum had occurred in February or earlier, the supernova would have shown a different behaviour in brightness during the following months. With regard to the blue magnitudes, the difference of 0.6 mag. between the last Byurakan observation and the

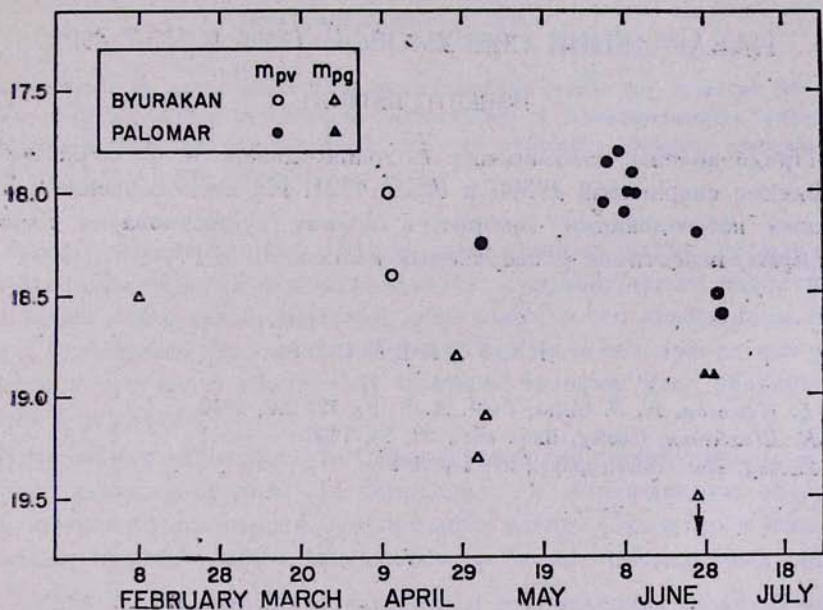


Fig. 2. Photovisual m_v and photographic m_{pg} observations of the supernova 1959b in NGC 4921.

two Palomar plates taken in the same period may be explained by the existence of a slight shift in the comparison scale and by the difficulty of the eye-estimation of images near to the plate limit. A further increase in brightness of the supernova is quite improbable because there is no trace of it in the photovisual curve.

Finally, we have not even ruled out the possibility of an interpretation in terms of a galactic variable. Therefore we looked at the same field from 1949 through 1966 inspecting almost 160 plates, but no trace of the star was found except during the 1959 outburst.

Because we have no observation between August 1958 and May 1959, except for a few 18" Schmidt films taken on November 1958 and January 1959, in which the star is not visible, any other data referring to the prediscovery period would be very interesting.

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California Institute of Technology
and
Asiago Astrophysical Observatory

НАБЛЮДЕНИЯ СВЕРХНОВОЙ 1959Ь В NGC 4921

РОБЕРТО БАРБОИ

Представлены паломарские фотовизуальные и фотографические наблюдения сверхновой 1959Ь в NGC 4921. Их сопоставление с Бюраканскими наблюдениями говорит в пользу существования плоского максимума, известного у сверхновых классов III и IV.

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