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NSV 16, THE ENIGMATIC VARIABLE IN CASSIOPEIA

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Name of the object:
NSV 16 = S 10134

Equatorial coordinates:	Equinox:
R.A. = 00 ^h 05 ^m 05 ^s .41 DEC. = +59°39'01".3	2000

Observatory and telescope:
Crimean Laboratory of Sternberg Astronomical Institute, 40-cm astrograph

Detector:	Photoplate
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Filter(s):	None
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Comparison star(s):	α (J2000)	δ (J2000)	B_{pg}
	00 ^h 05 ^m 05 ^s .5	+59°36'00"	14 ^m 16
	00 ^h 05 ^m 04 ^s .5	+59°36'46"	15 ^m 12
	00 ^h 04 ^m 51 ^s .7	+59°36'49"	15 ^m 37
	00 ^h 04 ^m 48 ^s .4	+59°40'54"	15 ^m 48
	00 ^h 05 ^m 01 ^s .6	+59°41'32"	15 ^m 86
	00 ^h 05 ^m 11 ^s .8	+59°37'50"	16 ^m 12
	00 ^h 05 ^m 00 ^s .3	+59°38'31"	16 ^m 59
	00 ^h 04 ^m 50 ^s .5	+59°38'18"	16 ^m 93
	00 ^h 04 ^m 58 ^s .1	+59°38'09"	17 ^m 00
	00 ^h 04 ^m 52 ^s .1	+59°38'53"	17 ^m 03
	00 ^h 04 ^m 48 ^s .0	+59°39'24"	17 ^m 17

Transformed to a standard system:	B_{pg}
Standard stars (field) used:	Calibrated using the photoelectric standard sequence in NGC 225 (Hoag <i>et al.</i> , 1961)

Date(s) of the observation(s):	
JD 2438587–2449274	
Availability of the data:	
Upon request	
Type of variability:	Unknown
Remarks:	
<p>The variable star NSV 16 (S 10134) was discovered by Hoffmeister (1967). He found variations between the photographic magnitudes $15^m.5$ and 17^m, suspected intermediate-period variability, but could not determine the variability type. The star was faint on most of Sonneberg plates.</p> <p>We studied the star on 411 plates of the Moscow collection and found a very complex pattern of variations between $14^m.2$ and fainter than $17^m.2$. Figure 1 displays examples of seasonal light curves of different years, with apparently quite different behavior. The first two sections (two consecutive moonless intervals when photographs were acquired) from the upper panel of Fig. 1 are shown in more detail in Fig. 2; whereas the first of them is characterized by almost constant (high) brightness, the star was fainter during the next month and seemed to vary quasi-cyclically. Finally, Fig. 3 shows short term variability on JD 2443079.</p> <p>The star is faint in the major all-sky surveys ($17.64B$ and $16.08R$ in GSC2.2; 18.10 and $17.66B$, 15.94 and $16.49R$; $15.39I$ in USNO B1.0). Its USNO A2.0 magnitudes, based on plates taken on the same night in 1954, confirm the star's yellow or slightly reddish color ($17.4B$, $15.7R$).</p> <p>It is difficult to attribute NSV 16 to any of the traditional variability types. At the galactic latitude $b \approx 3^\circ$, it is probably a Population I object. The density of stars around the object is normal, without obvious nebulae. The object definitely deserves a CCD-photometric and spectroscopic study.</p>	
Acknowledgements:	
<p>The work of the GCVS team is supported, in part, by grants from the Russian Foundation for Basic Research (grant 02-02-16069), The Federal Scientific and Technological Program "Astronomy", the program of support for leading scientific schools of Russia (00-15-96627), and the program "Unstable Processes in Astronomy" of the Presidium of Russian Academy of Sciences.</p>	

References:

- Hoag, A. A., Johnson, H. L., Iriarte, B., Mitchell, R. I., Hallam, K. L., Sharpless, S., 1961, *Publ. of the US Naval Obs.*, **XVII**, part VII, Washington
- Hoffmeister, C., 1967, *Astron. Nachr.*, **290**, 43

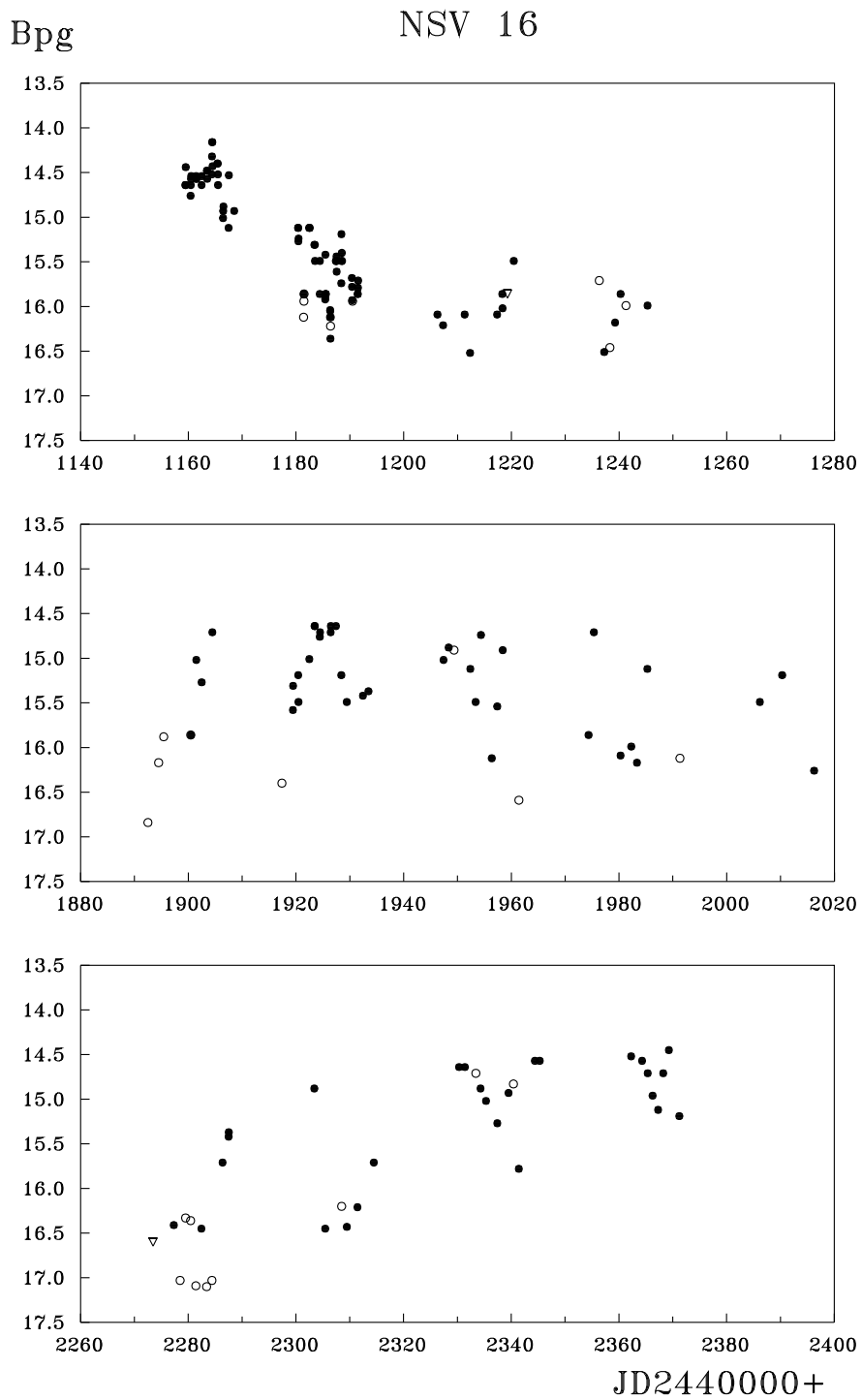


Figure 1. The sample light curves of NSV 16 for three yearly seasons of observations. Open circles: uncertain estimates; open triangles: brighter limits.

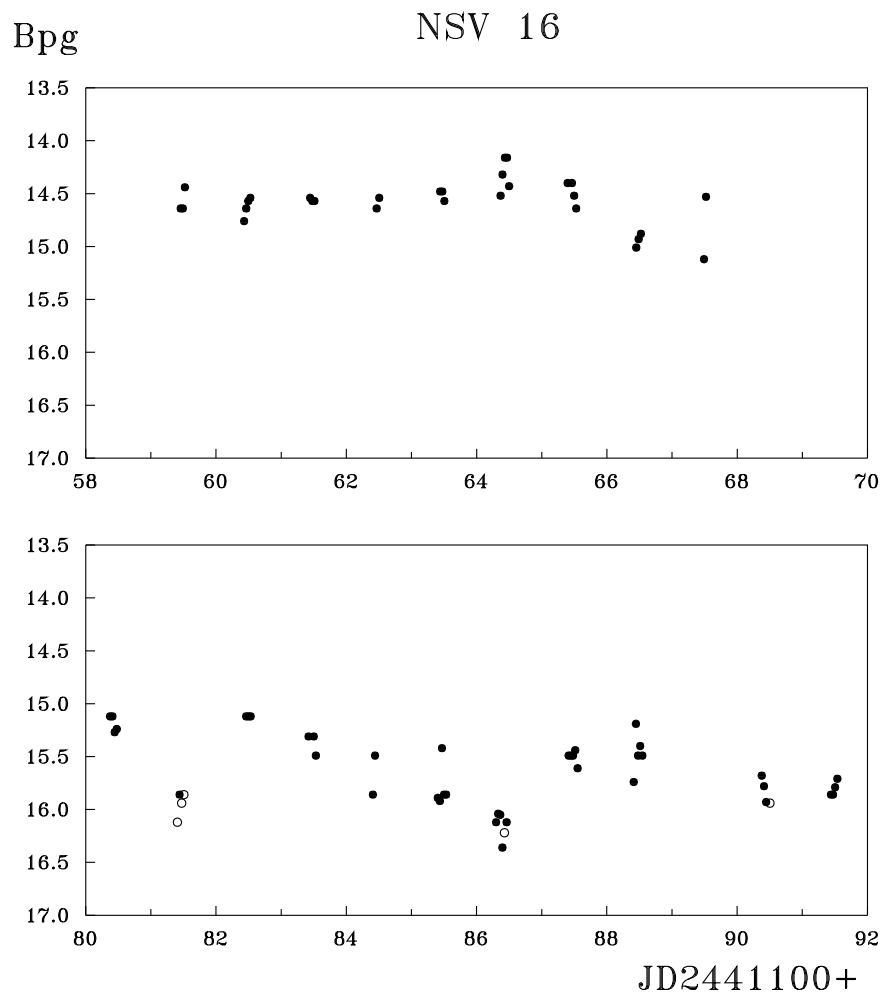


Figure 2. The first two monthly seasons from the upper panel of Fig. 1.

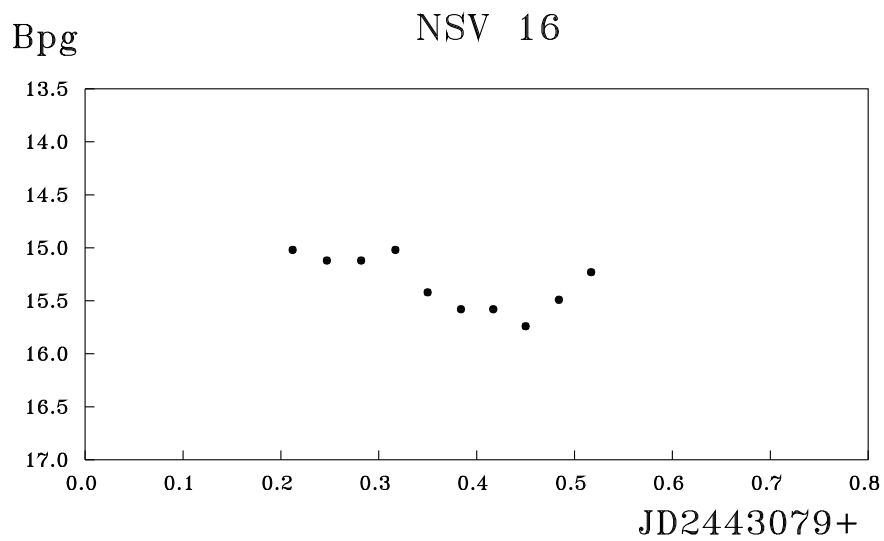


Figure 3. The light curve of the Algol-like minimum of NSV 16 on JD 2443079.