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ACCURATE ASTROMETRIC POSITION FOR M31-RV

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A mysterious event took place in the Andromeda galaxy in the summer of 1988, when a star of the inner bulge region erupted, peaking at $M_V = -10.0$. The event was different from other novae discovered in M31 (e.g. Rosino, 1973; Ciardullo et al., 1990): at peak brightness it displayed an M supergiant spectrum, as revealed by observations with the Palomar 5m telescope by Rich et al. (1989). The short duration of the event, the faint apparent magnitude and the delay of the announcement until the outburst was already over are responsible for limited observations on this very interesting and highly unusual event, for which theorists have not yet agreed on a shared interpretation.

The recent colorful happenings of V838 Mon, where a star erupted and became - within an expanding huge light echo - a supergiant with first K, than M and later a spectrum dominated by such cool features as have been observed only in brown dwarfs (Munari et al., 2002a; Geballe et al., 2002; Bond et al., 2003), have revitalized the interest in the similar red variable of M31, cited in literature as M31-RV or M31-RedVar.

The discovery that V838 Mon is a binary system where the companion to the exploded star is a massive B3V star (Munari et al., 2002b) and that it has developed a bright, huge and long lasting light-echo (Henden et al., 2002) is a stimulus to a detailed investigation, in particular on HST archive images, trying to locate the remnant - if any - of the M31-RV event. The understandably very crowded HST images of the bulge of the Andromeda galaxy would greatly benefit from the most precise astrometric position possible for M31-RV. The same coordinates and a good finding chart would also support the search in plate archives around the world for further photometry of the 1988 event. The original frame grabbed from the TV screen of the telescope guider and presented by Rich et al. (1989) as an identification of the field is hardly suited for the task. Furthermore, good coordinates and a finding chart could also stimulate screening of plate archives around the world looking for a confirmation or dismissal of a second, weaker outburst of M31-RV in 1967 allegedly reported by Sharov (1990) which, if real, could dramatically affect the interpretation of the event.

The position of M31-RV has been reported as $214''$ E and $196''$ S ($\pm 2''$) of M31 nucleus by Rich et al. (1989), as $214''$ E and $198''$ S by Sharov (1990) citing Rich et al., and as $3'$ from the nucleus by Mould et al. (1990). More precise positions of M31-RV (referred to J2000 equinox) have been reported by Ciardullo et al. (1990, their nova N.36) as

$$\alpha = 00^{\rm h}43^{\rm m}02\overset{\rm s}{.}1 \qquad \delta = +41^\circ 12' 55''$$

by Bryan and Royer (1992) as

$$\alpha = 00^{\rm h}43^{\rm m}01\overset{\rm s}{.}7 \quad \delta = +41^\circ 12' 59''$$

and by Tomaney and Shafter (1992) as

$$\alpha = 00^{\rm h}43^{\rm m}02\overset{\rm s}{.}4 \quad \delta = +41^\circ 12' 56''$$

The scatter among these measures (4.6 arcsec) is large and unsuited to support identification of the remnant on HST images.

Table 1: Asiago archive plates imaging the 1988 outburst of M31-RV.

plate N.	date	UT	emul.	filter	exp. (sec)
14197	13 Aug 1988	00:03	103a-E	RG-1	1800
14222	8 Sep 1988	01:27	103a-E	RG-1	1800

We have located in the plate archive of the Asiago 67/92 cm Schmidt telescope (205 cm focal length) two plates secured during the outburst of M31-RV in 1988. Details of the plates are given in Table 1. The USNO-B catalog uses plate material that is saturated near the nucleus of M31. To properly measure the position of M31-RV on the Asiago plates, a deep image of M31 was taken with the USNO Flagstaff Station 1.0m telescope. USNO-B stars further from the nucleus were used to place all stars visible on the Asiago plates on the same astrometric system. Measurement of M31-RV was then possible with respect to these secondary astrometric standards, resulting in:

$$\text{plate14197} \qquad \alpha = 00^{\rm h}43^{\rm m}02\overset{\rm s}{.}42 \quad \delta = +41^\circ 12' 56\overset{''}{.}7 \tag{1}$$

$$\text{plate14222} \qquad \alpha = 00^{\rm h}43^{\rm m}02\overset{\rm s}{.}41 \quad \delta = +41^\circ 12' 57\overset{''}{.}1 \tag{2}$$

The position on the two plates agrees within 0.2 arcsec, representing more than an order of magnitude gain in accuracy compared to what available so far in the literature, and making the search for the remnant on HST images now more feasible. A finding chart from plate 14197 is presented in Figure 1.

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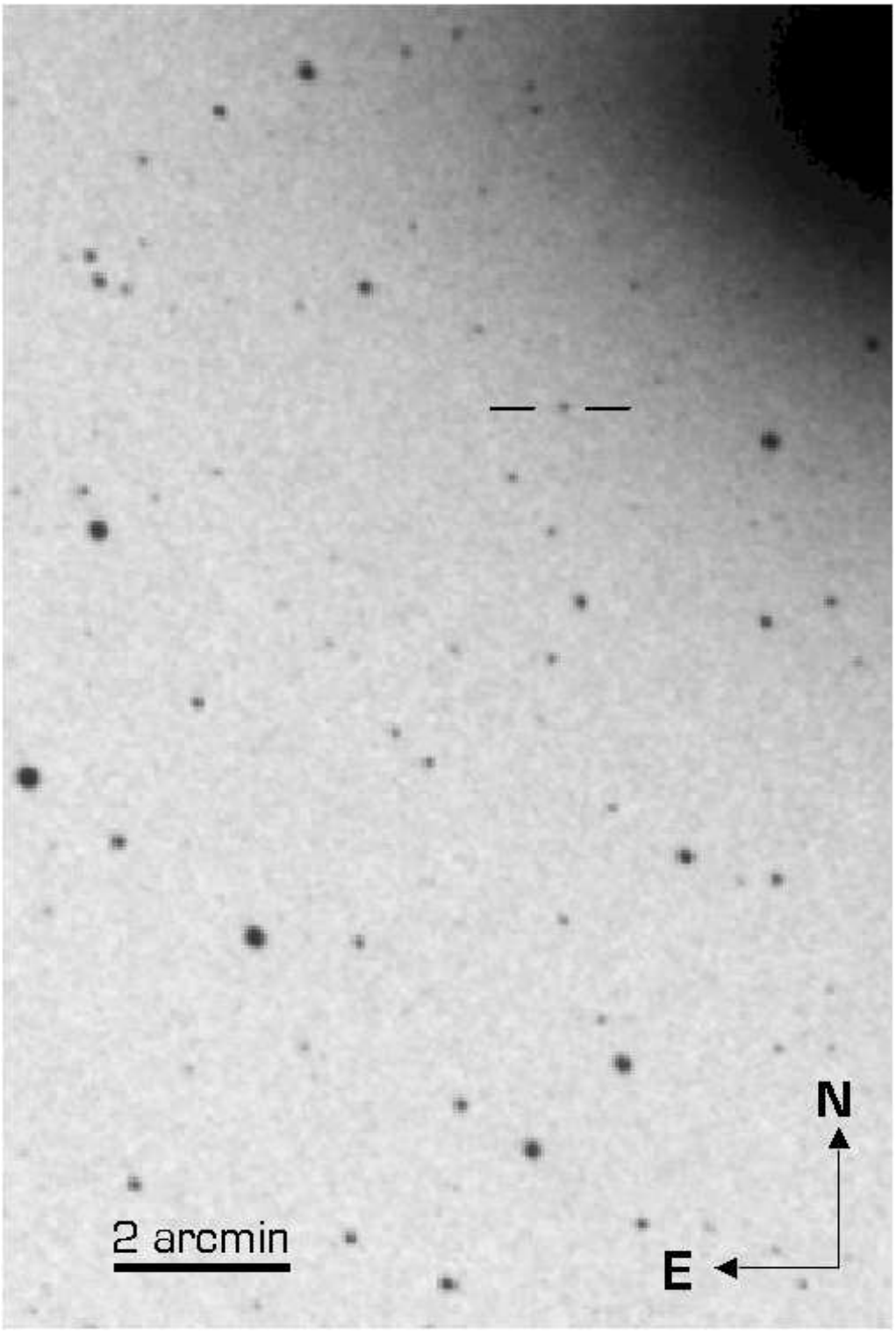

Figure 1. Finding chart for M31-RV from Asiago archive plate 14197 (cf. Table 1).

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ERRATUM FOR IBVS 4807

The original title of IBVS 4807 contained an error:

"Two New Eclipsing Binary Systems in Cepheus: the W UMa NSV 14312 and the Eccentric EA GSC 3992_30847"

The correct GSC number is, as used in the body of the paper: 3992_0847 .

The Editors