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THE IDENTITY OF XY Psc

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XY Psc is a variable star discovered by Rosino and Pigatto (1972a, RP72a) with the 40/50 cm Asiago Schmidt telescope during the course of the Asiago Supernova Survey. It was initially thought to be a supernova in the faint galaxy UGC 729. XY Psc was observable on films taken on October 5, 1972 (estimated at $m_{pg} = 13.0$) and October 17, 1972 (at $m_{pg} = 15.0$), but not on films taken before or after (with m_{pg} limiting magnitudes around 18.5). Deming et al. (1972) failed to find the object on plates taken at Prairie Observatory on October 27, 1972 (limiting magnitude $B = 17$). It was also not found on POSS-I prints, yielding a deeper quiescent magnitude of about $B = 20$. Based on this rapid rise and decline and the large amplitude, Rosino and Pigatto (1972b, RP72b) suggested that the object was a U Gem cataclysmic variable of large amplitude and long period.

Downes and Shara (1993, DS93) give a finding chart with a faint star marked. Downes, Webbink and Shara (1997, DWS97) give essentially the same position, with a note that the star is at or below the plate limit and the coordinates are approximate. Visual observation of this field began in 1980 with the issue of a finding chart by Bateson et al. (1980). No outbursts have been detected since that date by VSNET, AAVSO or VSS RASNZ observers.

A deep image with the USNO Flagstaff Station (USNOFS) 1.0-m telescope (limiting magnitude around $V = 24$), shown in Figure 1, shows a faint blue object near the RP72a coordinates. To further confirm the identity, we used the USNOFS PMM to scan four film pairs from the Asiago Schmidt. Each pair consists of a 5-minute 103aO film exposure along with a 15-minute TriX Pan film exposure. These correspond roughly to B and V filtration. One film pair was taken on August 12 (before the outburst), one pair was taken on October 30 (after the outburst), and the other two film pairs are the ones reported in RP72a and RP72b. After scanning, accurate coordinates and instrumental magnitudes were extracted for all objects including XY Psc. The four outburst scans were added to create the finding chart shown in Figure 2 (identifying circular marks were left on the films and show faintly in this figure; limiting magnitude is about $V = 18$). Table 1 lists

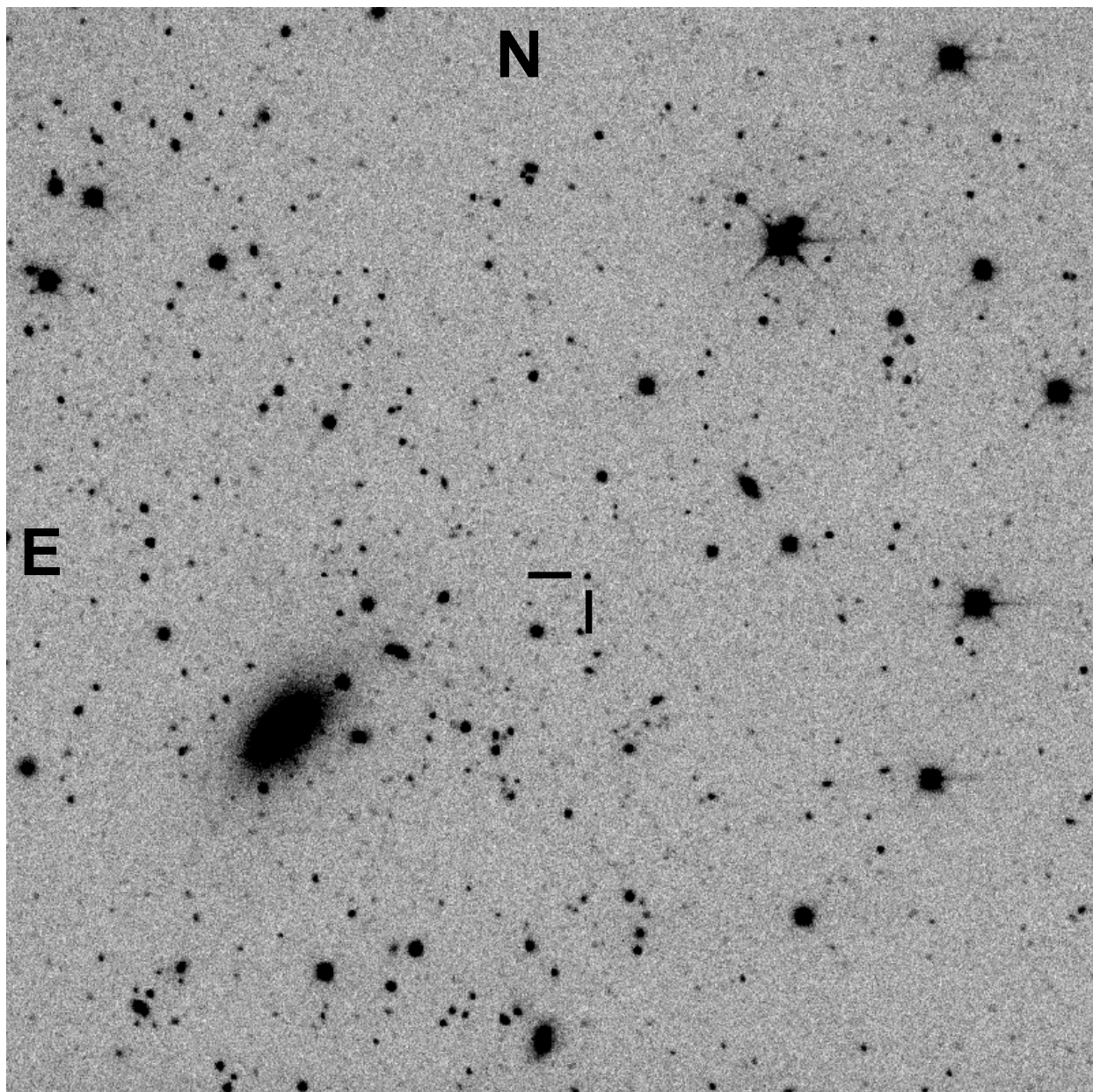


Figure 1. Combined quiescent NOFS CCD image of field. The field of view is $10' \times 10'$

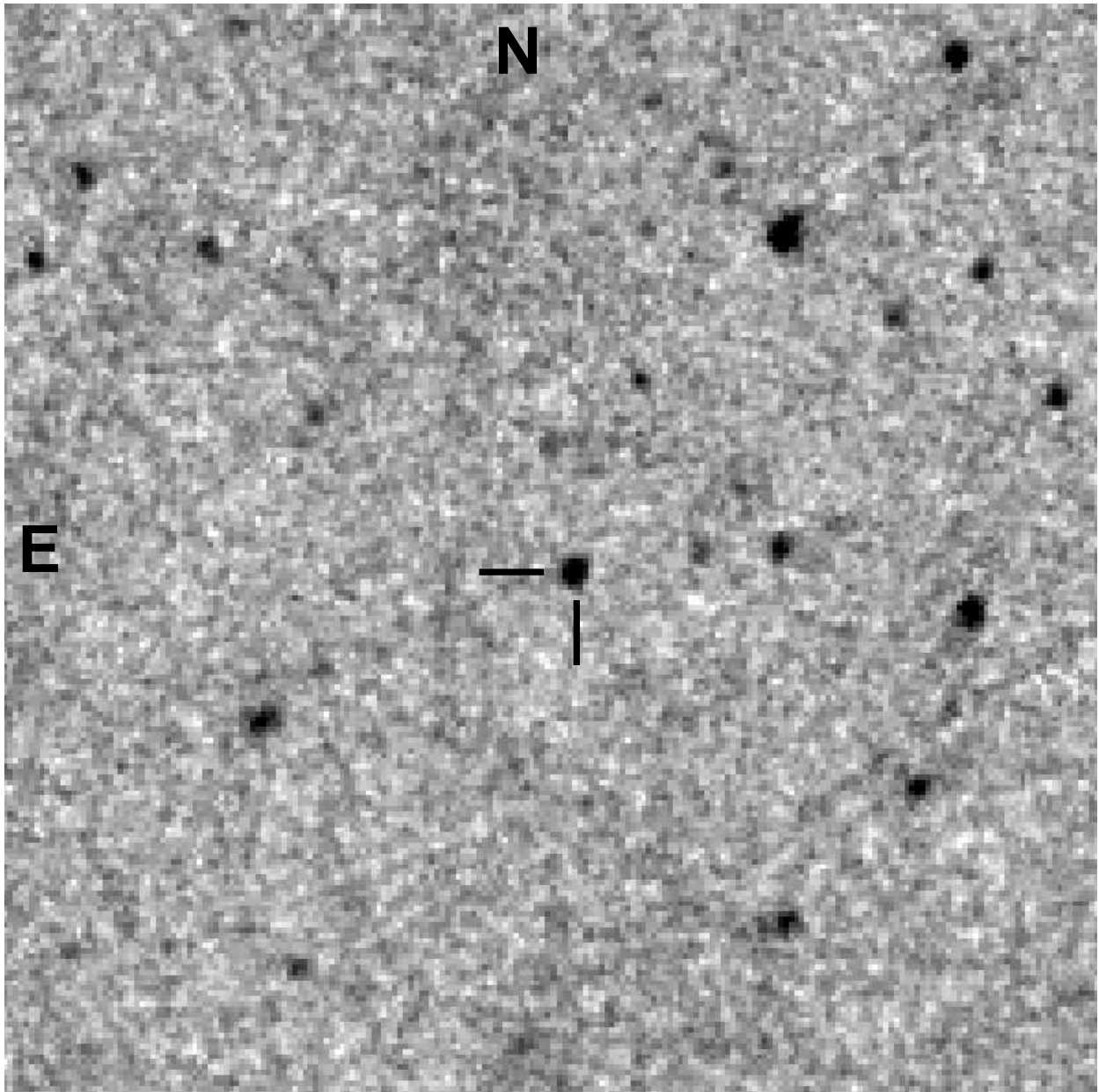


Figure 2. Combined outburst image of field from Asiago films. The field of view is $10' \times 10'$

Table 1: Coordinates for XY Psc

Source	RA(J2000)	Dec(J2000)
RP72a	01 ^h 10 ^m 12 ^s	+03°32'37"
DS93	01 ^h 10 ^m 11 ^s	+03°32'37"
DWS97	01 ^h 10 ^m 11 ^s	+03°32'36"
Outburst/PMM	01 ^h 10 ^m 11 ^s .28	+03°32'35".3
Quiescent	01 ^h 10 ^m 11 ^s .23	+03°32'35".1

Table 2: Photometry of XY Psc

Date (UT)	<i>V</i>	<i>B</i> − <i>V</i>
720813.0122	< 17.0	—
721005.8958	13.7 ± 0.1	+0.5 ± 0.1
721017.0221	15.2 ± 0.1	+0.7 ± 0.1
721030.8667	< 17.0	—
990813.4681	21.10 ± 0.07	+0.18 ± 0.07
990918.4008	21.10 ± 0.08	−0.02 ± 0.08

the coordinates obtained from the scans, along with the earlier reported locations (RS72a has been precessed) and the CCD deep image position. The film scan position has errors of about one arcsec; the CCD position has 0".2 internal errors. Both measured positions are relative to USNO-A2.0.

The instrumental magnitudes were transformed onto the standard Johnson system using the secondary standards given in Henden (2001). The results are given in Table 2, along with the quiescent CCD photometry.

We restrain here from speculations about the nature of this puzzling object (somewhat too large an outburst for a CV, too faint a maximum for a nova, missing a parent galaxy and too fast for a supernova), which will be discussed elsewhere together with new spectroscopic and photometric observational material.

We gratefully acknowledge the assistance of Dave Monet and Steve Levine in using the PMM plate scanner for measuring the original Asiago films, and D. Moro for locating the films in the Asiago archive.

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