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**DISCOVERY OF SOUTHERN VARIABLES .**

For several years Paul J. Canilleri (PC) of Cobram, Victoria, Australia, has conducted a regular photographic patrol of the Southern Milky Way for novae. His equipment consists of an 85mm lens and T-Max 400 film. His search technique consists of laying two negatives (one new & one old) of selected areas of the Southern Milky Way on a light table. He searches each pair of negatives by stereo fusing them with a pair of 8x eye loupes, and any small difference will show itself very easily.

Nine novae have been discovered to date, using this technique (see Table 2). The other author of this paper (MM) collaborates with PC by searching published catalogues and datasets for supportive data e.g. photoelectric magnitude sequences, for each discovery, as well as preparing accurate finder charts. A useful byproduct of the nova patrol has been the discovery of variable stars of other types. This paper reports the discovery of ten such variables.

Table 1 lists the variables discovered. The first data field (column 1) gives the provisional designation. The second field gives the observed magnitude range. The third data field gives the Right Ascension and Declination (J2000), usually taken from the Guide Star Catalogue (GSC), or estimated relative to nearby GSC stars. The fourth data field gives the GSC number, if existing. The fifth data field gives names found in other catalogues, followed by spectral types in brackets. Notes at the bottom of the table are indicated by numbers in square brackets. The normal limiting magnitude of the nova patrol films is 12-13pv. A few stars have been observed down to fainter limits by R. McNaught at Siding Spring Observatory (1990), and the range given in Table 1 reflects this better coverage.

An extensive log of observations exists, which is available upon request from the senior author. The discovery films are of small scale and many of the observations are of limited accuracy. It is beyond the scope of this Bulletin to publish the dataset. On the original films the variations are quite distinct. The reality of these discoveries is attested to by the number of recoveries - stars previously suspected of variability. Three stars, PC4, PC5 and PC7 are in the NSV Catalogue (1982). PC3, PC7 and PC10 were also recorded as variable by McNaught (1990) in a photographic patrol in 1986/87. The variability of PC4 was also discovered independently by Wakuda (Japan). Most of the stars are red, with S type indicated for PC5 in the General Catalogue of S Stars (Stephenson, 1984); and carbon star types given for PC8 and PC9 in the Catalog of Cool Carbon Stars (Stephenson, 1973). The variations appear to be slow, of long period, but the lack of complete light curves makes classification difficult.

Fig. 1 provides finder charts for all of these variables, plotted from the GSC.

TABLE 1: POSITIONS AND IDENTIFICATIONS FOR PC VARIABLES.

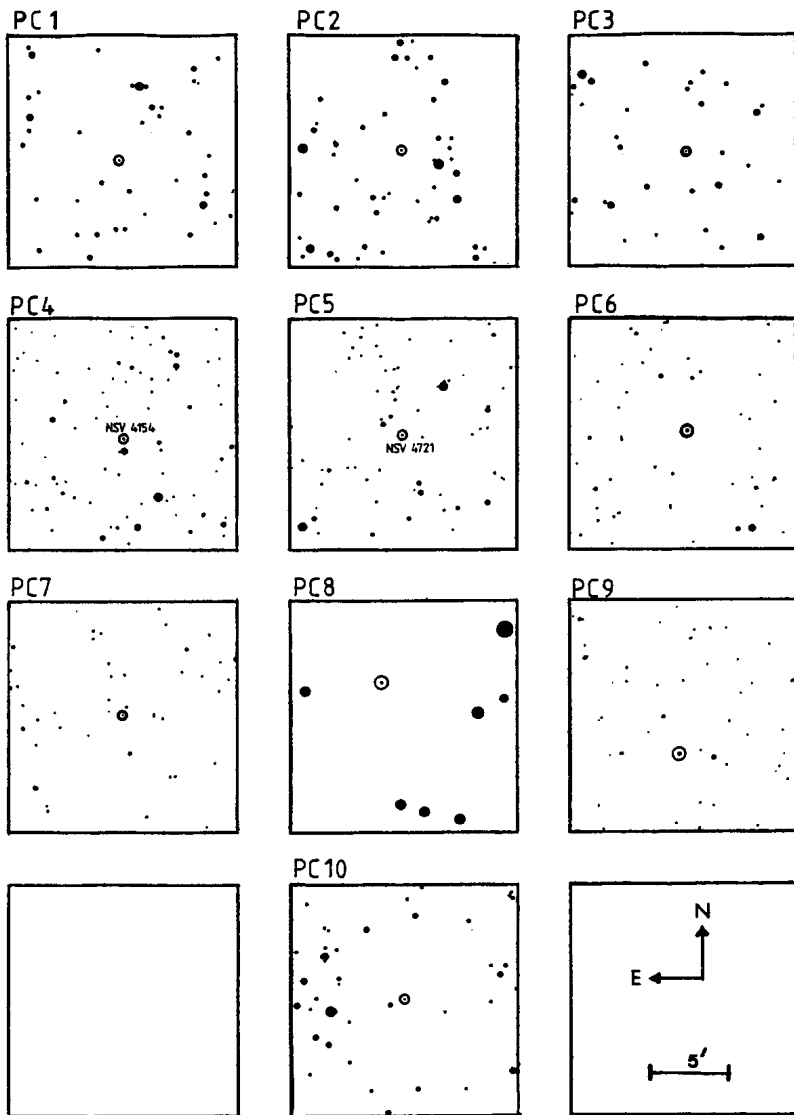
PC #	Range	R.A. (J2000)	DEC.	GSC Ident.	Name; Sp.; Notes
	m (pv)	h m s	° ' "		
PC1	11-<13	17 21 56.2	-51 25 26	8353-00973	
PC2	10-13	16 35 38.7	-52 14 15	8337-01640	
PC3	11-17	16 39 18	-54 04.6	.....	[1][2][4]
PC4	9.0-<12	08 36 48.9	-36 27 38	7148-03970	NSV 4154 [2]
PC5	9.5-12	10 03 29.9	-46 49 15	8182-00076 =8182-02311	GCSS 652 (S5,8e) NSV 4721 [2]
PC6	10-<12	10 00 48.8	-47 08 06	8186-00731	
PC7	11-15.2	14 51 06.5	-54 46 19	.....	NSV 6825 [1][3]
PC8	10-12	12 40 15.2	-57 22 46	8655-03805	CCCS 2023 (C)
PC9	10.5-<12	11 33 58.0	-73 13 18	9233-02206	CCCS 1882 (C)
PC10	11-<15	07 58 25.9	-40 19 50	7650-01772	[1][2]

## NOTES:

- [1] Previously found by R. H. McNaught (1987).  
 [2] Mira type?  
 [3] Infra red excess.  
 [4] Very red (SR/I comparison).

TABLE 2: BASIC DATA FOR NOVAE DISCOVERED BY P.CAMILLERI.

#	Name; Const.; Year	R.A. (B1950)	DEC.	Range (V)	Disc. Date
		h m s	° ' "		
1.	V2264 Oph; 1991 #1	17 17 14.02	-26 43 27.1	9.8 - <21	11/4/91
2.	V4160 Sgr; 1991	18 10 58.12	-32 13 23.6	7.0 - <21	29/7/91
3.	V444 Sct; 1991	18 44 26.58	-08 24 12.0	10.5 - 20	30/8/91
4.	V2290 Oph; 1991 #2	17 40 07.44	-20 05 35.0	9.3 - <21	28/10/91
5.	V351 Pup; 1991	08 09 44.11	-34 58 29.2	6.5 - 20	27/12/91
6.	V4157 Sgr; 1992 #1	18 06 28.68	-25 52 32.1	7.0 - 18	13/2/92
7.	V992 Sco; 1992	17 03 42.69	-43 11 26.5	7.2 - 18	22/5/92
8.	V4171 Sgr; 1992 #3	18 20 39.40	-23 01 05.2	7.5 - 20	13/10/92
9.	.... Oph; 1993	17 22 04.41	-23 08 32.2	9.0 - <21	14/4/93



**Fig. 1.**  
Finder charts for PC variables 1 to 10.  
North is up, East at left. All charts are at the  
same scale as given by the scale bar.

Notes on Particular Stars. Many of the PC variables coincide with IRAS-PSC objects. These are :

PC1.	IRAS 17179-5122, (1950)	17h17m59.4s	-51°22'33"
PC2.	IRAS 16317-5208, ( " )	16 31 43.7	-52 08 08 .
PC3.	IRAS 16353-5358, ( " )	16 35 21.9	-53 58 45 .
PC4.	IRAS 08348-3617, ( " )	08 34 53.7	-36 17 07 .
PC5.	IRAS 10015-4634, ( " )	10 01 31.4	-46 34 42 .
PC6.	IRAS 09590-4656, ( " )	09 59 04.2	-46 56 02 .
PC7.	IRAS 14474-5433, ( " )	14 47 29.9	-54 33 58 .
PC8.	IRAS 12374-5706, ( " )	12 37 24.3	-57 06 19 .

PC4 = NSV 4154. This star has been placed on the visual observing list of the Variable Star Section, Royal Astronomical Society of New Zealand. Charts have been published (Bateson and Morel, 1992).

We wish to acknowledge the previous work done in studying some of these variables by Robert H. McNaught, Siding Spring Observatory. We thank Minoru Wakuda for his observations of PC4 = NSV 4154. We also acknowledge the NASA-NSSDC Astronomical Data Center, for providing datasets (114 selected astronomical catalogues on CD-ROM) which have been very useful.

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