PUBLICATIONS OF
THE DAVID DUNLAP OBSERVATORY
UNIVERSITY OF TORONTO

VOLUME 3 NUMBER 6

A THIRD CATALOGUE OF VARIABLE STARS IN GLOBULAR CLUSTERS COMPRISING 2119 ENTRIES

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HELEN SAWYER HOGG

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INTRODUCTION

This is the third in the series of catalogues of variable stars in globular clusters published by the David Dunlap Observatory. The first appeared in 1939 (David Dunlap Publications, vol. 1, no. 4) and the second in 1955 (vol. 2, no. 2). In addition, a catalogue of variables in globular clusters south of -29° declination was published in 1966 at Cordoba by C. R. Fourcade and J. R. Laborde, along with a splendid atlas of photographic prints of clusters prepared by J. Albarracin.

A preliminary edition of this Third Catalogue, in manuscript form, comprising 2057 entries, was circulated at the IAU Colloquium no. 21, "Variable Stars in Globular Clusters and in Related Systems," in August 1972. Investigators were invited to send corrections and additions to the author of the manuscript by October 2, 1972. The cut-off date for material included in this publication is November 1, 1972. Considerable new material was received, much of it from the Colloquium itself. This led to extensive revisions in the manuscript and some delay in its publication. Some of the conclusions drawn from the material of the Third Catalogue are in press in the Colloquium volume edited by J. D. Fernie.

SUMMARY OF DATA ON VARIABLES IN GLOBULAR CLUSTERS

At present a recorded search for variables in 108 of the approximately 130 globular clusters belonging to our galaxy has been made. This search has yielded 2119 variables. Certainly variables do not abound in most globular clusters. Of the 108 clusters that have been examined, only 10 contain more than 50 variables each, and 81 contain fewer than 20 variables each. At the time of compilation of the Second Catalogue, from the distribution it appeared that the most frequent number of variables found in a globular cluster was one. Now, from the data in the Third Catalogue, the most frequent number is zero. There are effectively 13 clusters with no variables, if one includes NGC 6397, whose three variables are considered field stars. One variable alone is found in each of 10 clusters.

Figure 1 shows the frequency distribution of the number of variables per cluster. More than 60 per cent of the clusters examined, 65 in all, have 10 variables or fewer; exactly 25 per cent, 26 clusters, have more than 20 variables; and 5 clusters have approximately 100 or more. The richest cluster still remains NGC 5272, Messier 3, with 212 variables. The second richest is Omega Centauri, NGC 5139, with 179. Next in order of richness is IC 4499, a newcomer in this catalogue, less than 10° from the southern celestial pole, with 129 discovered by Fourcade and Laborde, and 41 suspected. Messier 15, NGC 7078, with 111 and Messier 5, NGC 5904, with 97 complete this list of exceptionally rich clusters.

One of the problems faced in compiling this catalogue was to decide whether to include or exclude field variables. In general my policy has been to number those variables which lie within the obvious confines of a cluster, even though some of them are manifestly field stars. To omit them would ultimately lead to confusion. On the other hand, work of recent years in the surroundings of globular clusters has shown that

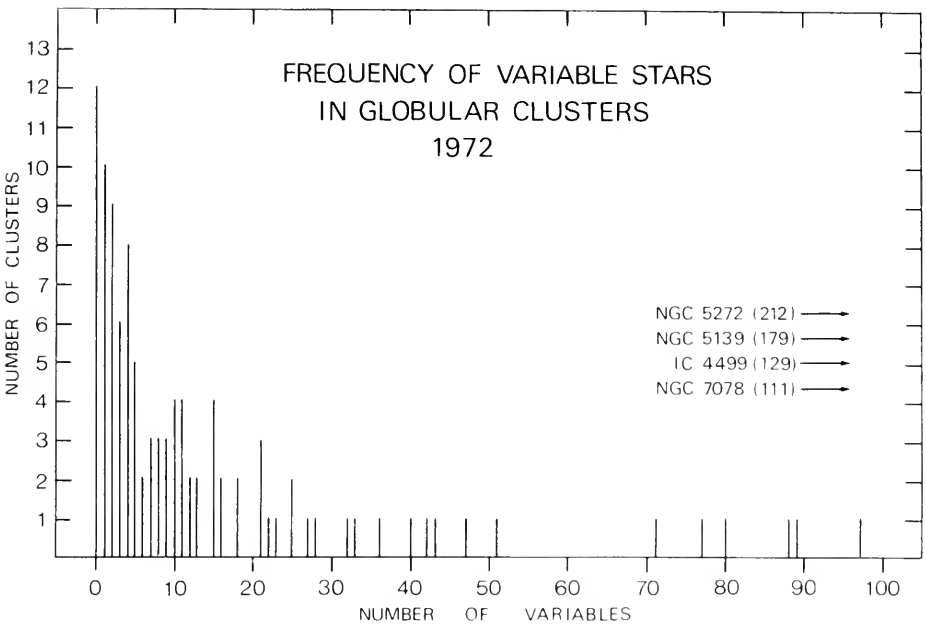

Figure 1 Distribution of the known, published variables per cluster.

some of the RR Lyrae stars well beyond their confines are likely members, or were so in the past. These stars are not included among the numbered variables of a cluster, except in a few cases.

NUMBERS OF TYPES OF VARIABLES AND KNOWN PERIODS

Of the known variables, periods have now been determined for 1313 in 55 clusters, compared with 843 in 38 clusters in 1955. In many clusters some periods have been revised or redetermined. In some cases there are only minor changes in the fifth or higher decimal places, but in others the change is major, even in the first decimal, giving an alternate period. In addition, many determinations of period changes have now been made. An effective summary of such changes in a concise catalogue is not possible, and the reader is referred to the original papers for pertinent data.

Table I gives a summary of the numbers and types of variables and numbers of periods known in the 108 globular clusters for which there is a record of search. For further particulars about these stars, such as cluster membership, the reader is referred to the catalogue itself.

The first column of the table gives the customary designation of the cluster, usually the NGC number. The second gives the total number of variables, and the third the total number of known periods. Periods for RR Lyrae stars are counted as known even when the published value is questionable or there is an alternate period, providing at least two decimals are given; and for semiregular variables if a numerical value of the cycle has been published. The fourth column gives the number of RR Lyrae periods

TABLE I

Summary of Variable Stars in Globular Clusters

NGC	Total variables	Total periods	RR Lyr periods	1-30 days	31-99 days	100-220 days	>220 days	Irr SR	Others
104	28	10	2		3	5		4	
288	1	1				1			
362	15	10	7	2	1				
1261	15	0							
Pal 1	0								
Pal 2	0								
1851	10	0							
1904	7	3	3					1	
2298	2	0							
2419	36	0						5	
2808	9	0							
Pal 3	1	0							
3201	88	84	83						EA, mem?
Pal 4	2	2				2			
4147	16	15	15						
4372	2	0							
4590	42	38	37				1 F		
4833	16	9	6		1		2 F	1	
5024	47	36	33	1	1	1			
5053	11	10	10						
5139	179	159	142	7	5	2	1 F	3	3 E, 1 RRs
5272	212	186	182	1	2	1			1 EW
5286	8	0							
5466	23	21	21						
5634	7	1	1						
5694	0								
14499	129	0							
5824	27	9	9				1		
Pal 5	5	5	5						
5897	7	7	6		1				
5904	97	92	90	2				1	1 UG
5927	11	1					1		
5946	3	0							
5986	5	0							
6093	8	3		1		1 F	1 F		1 N
6101	0								
6121	43	42	40		2				
6139	0								
6144	1	0							
6171	25	23	22				1 F		
6205	11	7	3	3 M	1 M			2 M	1 F
6218	1	1		1					
6229	22	15	14	1					
6235	2	0							

Table 1 (continued)

NGC	Total variables	Total periods	RR Lyr periods	1-30 days	31-99 days	100-220 days	>220 days	Irr SR	Others
6254	4	2		2				1	
Pal 15	0								
6266	89	74	74						
6273	4	0							
6284	6	0							
6287	3	0							
6293	5	0							
6304	21	0							
6333	13	11	11						
6341	15	13	12						1 EW F
6352	4	0							
6356	10	1				1			
6362	33	15	15						
6366	2	0							
HP 1	15	0							
6380	1	0							
6388	9								
Ton 2	2	0							
6397	3	3	1 F		1 F		1 F		
6401	3	0							
6402	77	40	34	5			1 F		1 N
Pal 6	0								
6426	13	11	11						
6441	10	0							
6453	0								
6496	0								
6522	10	9	8	1 F				1 F	
6528	0								
6535	1	0							
6539	1u	0							
6541	1	0							Slow, prob. mem
6553	18	4	3				1		2 slow, 1 N
6558	9	0							
11276	5	1	1					4?	
6569	5	0							
6584	1	0							
6624	4	0							
6626	18	10	7	2	1				
6637	8	2				2 M			1 RR F, 2 red giant
6638	3	0							
6642	2	0							
6652	0								
6656	32	27	18	1 M	2	2 F?	4 F?	1 M	
6681	2	0							
6712	21	16	10			6			1 UG, 2 E F?
6715	80	37	34	1	1	1			2 E, 2 SR, 3 F

NGC	Total variables	Total periods	RR Lyr periods	1-30 days	31-99 days	100-220 days	>220 days	Irr SR	Others
Table I (continued)									
6723	25	19	19						
6752	2	0							
6760	4	0							
6779	12	4	1 F	1	1			6	1 RRs F?
Pal 10	1	0							
6809	6	5	5						
Pal 11	0								
6838	4	2				1		1	1 EA, mem
6864	11	0							
6934	51	30	30						1 slow
6981	40	28	28						
7006	71	58	57		1				
7078	111	68	65	3					
7089	21	21	17	3	1				
7099	12	4	3						1 UG
Pal 12	3	0							
Pal 13	4	4	4						
7492	4	4	3	1					

determined. The next three columns cover the period interval between the RR Lyrae and the Mira stars with periods greater than 220 days. The totals in this period interval are broken down arbitrarily into three groups. The shorter group is made up mainly of W Vir stars, and the longer of short-period Mira stars, with semiregular or RV Tauri types in between. Only those variables technically in the pulsating variable group are included in the above-mentioned columns. Others, mainly eclipsing, are noted in the last column of the table. Mira stars with periods over 220 days are in the eighth column. These are mainly field stars. The ninth column contains those variables with no period given, mainly red ones, with irregular or semiregular fluctuations.

About 8 per cent of the stars in the catalogue, 169 in all, are definitely designated as other than RR Lyrae. There are 39 in the 1-30 day group, 26 in the 31-99, 26 in the 100-219, and 15 with a period of over 220 days. A conspicuous difference between the Third and Second Catalogues is the increase in the number of red irregular variables, many with small ranges.

DISTRIBUTIONS OF RR LYRAE PERIODS

There are 1202 definite RR Lyrae periods known in 46 clusters. The importance of the difference in most frequent length of period in individual clusters has been widely discussed since Oosterhoff first called attention to it. Figure 2 shows the distribution of all RR Lyrae periods in globular clusters for period intervals of 0.01 day. The double maximum of this distribution, conspicuous in the Second Catalogue, is further en-

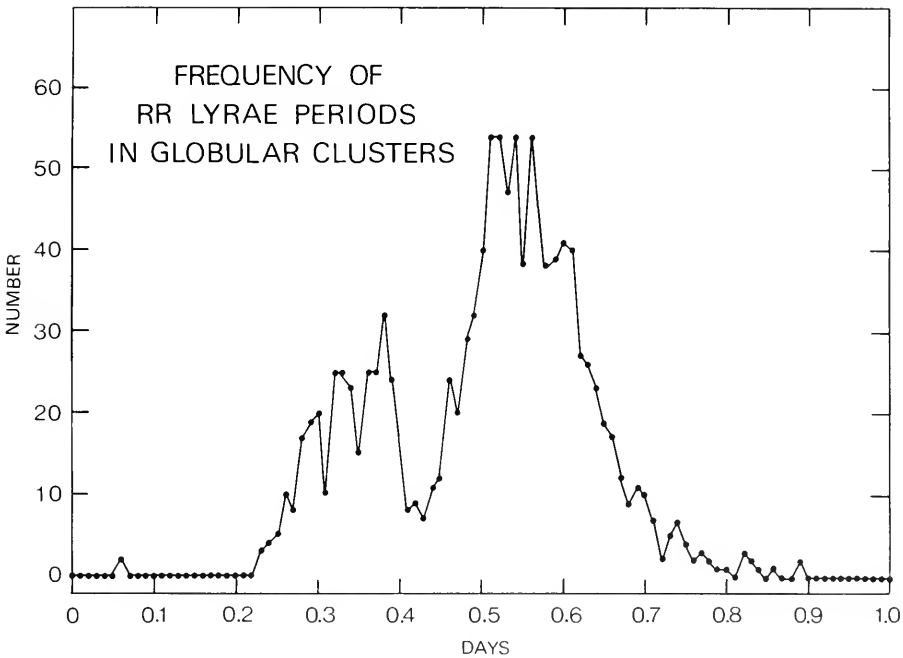

Figure 2 Numbers of RR Lyrae periods at intervals of 0.01 days.

hanced by the new material. Certainly in globular clusters variables of the RR*ab* type have a strong preference for periods around 0.55 day, and of the RR*c* type, around 0.35 day.

DESCRIPTION OF THE CATALOGUE

The catalogue contains every globular cluster considered as belonging to our galaxy for which there is now a published record of search for variables. These clusters number 108, and 11 others are mentioned in brief references.

For the material of the catalogue an attempt has been made to select the most recent or the best determined data. This means that in some clusters for even a single variable the data in different columns may be drawn from different sources. When the Second Catalogue was prepared in 1955, every effort was made to obtain from the authors, or their respective institutions, information sufficient to identify variables listed many years earlier as unpublished. Despite this attempt, much of the unpublished material had to be left in relatively useless form. Now, 17 years later, it seems unlikely that any more of this material can ever be salvaged, and in most cases it is not mentioned in the Third Catalogue.

The system of references has been put on a different basis from that used in the First and Second Catalogues. As the literature proliferates with the years, it becomes no longer feasible to reprint all the references for a cluster in each catalogue. Accordingly

only references since the publication of the Second Catalogue are included for the most part, along with a few overlooked earlier. However, for some clusters on which there has been no key work since then, an occasional early reference has been repeated to aid the reader.

The format of the reference system has also been altered from that used in the earlier catalogues. References are now printed under each cluster. The abbreviations of publications have been chosen to conform to the system of H. Schneller in *Geschichte und Literatur des Lichtwechsels der Veränderlichen Sterne* (Berlin), which seems to convey the necessary information in as concise a manner as possible. An index of the abbreviations used is given at the end of the catalogue. Photo or chart is shown by (p) or (c).

The principal papers on variables in any cluster are listed by author and abbreviated reference. However, there are some papers (23 in all) with remarks about many clusters. These more frequently mentioned papers are abbreviated to initials and the year of publication in this century, the key to these abbreviations being also given at the end, with the title of the paper. For clusters for which the Atlas and Catalogue of Fourcade, Laborde, and Albarracin contains new material, this reference is listed with the main references; otherwise it appears among the highly abbreviated ones.

Anyone actually investigating a cluster is strongly urged to consult the full list of references given in the Second Catalogue.

The clusters are listed in order of NGC number, which does not always correspond to the order in right ascension. Those lacking an NGC number are placed in order of right ascension, which, along with declination, is given for the equinox of 1950. If the cluster has a Messier number, that is given.

The variables are numbered according to the previous catalogues, and new numbers are usually assigned in order of discovery. The policy is to try to restrict the new numbers to those variables within the apparent physical area of the cluster, but it is not feasible to follow this rule rigidly.

The x and y coordinates are given in seconds of arc and correspond in direction to right ascension and declination. For a given cluster, they are usually those published by the first investigator, or reduced to his selected centre. In some cases, these coordinates unfortunately are not yet available.

The magnitudes are usually the latest that have been obtained, which are hopefully the best determined for maximum and minimum. Most of the magnitudes are photographic, but there is a gradual shift to the use of B magnitudes.

The epoch of maximum is usually, but not always, chosen as the one accompanying the period selected. Individual papers should be consulted to determine whether the time is heliocentric or geocentric.

The period is generally that most recently published. Stars with periods less than a day are assumed to be of RR Lyrae type unless otherwise indicated in the remarks. For stars with periods between one and thirty days the type is assumed to be Cepheid.

The "remarks" column contains a miscellany of information. An increase or decrease in period is indicated by + or − respectively, a constant period by "cst" or 0. "Alt" means an alternate period has been published, "var" signifies a variable period, and "BC"

the Blashko effect. An available spectral type is indicated by "Sp" sometimes followed by the type without subdivision, and an available radial velocity by "V." Stars which have been shown to be definitely or very probably field stars are indicated by "f" and proven cluster stars by "mem." The abbreviation used for the type of variable is that in the Third Edition of the *General Catalogue of Variable Stars* by B. V. Kukarkin *et al.* (1969). For variables found since publication of the Second Catalogue, the discoverer is usually indicated.

ACKNOWLEDGMENTS

It is a pleasure to acknowledge the help I have received in the construction of this catalogue. This has come from many astronomers who have sent unpublished or explanatory data, as indicated in the references under individual clusters. I am particularly grateful to Professor Dr. B. V. Kukarkin of Moscow University, who, in the midst of his great task of recording all galactic system variables, has taken time to keep me briefed on Soviet work in globular clusters and to send me corrections to some of my previous papers. Also Dr. H. Wilkens of Argentina has been a constructive reader of my past works, and Dr. Steven van Agt of Nijmegen has straightened out the material on NGC 6362.

My thanks go also to the two directors of this observatory under which the Third Catalogue has been compiled, Dr. John F. Heard and Dr. Donald A. MacRae; to the National Research Council of Canada for their generous support of my cluster program; to my colleagues Dr. Amelia Wehlau of the University of Western Ontario and Dr. Christine Coutts; to the two librarians who assiduously tracked down elusive references, Mrs. Jean Lehmann and Mrs. Sheila Smolkin; to Mrs. Jennie Fabian, who prepared the preliminary version for distribution at IAU Colloquium no. 21 in August 1972; and last but not least to my daughter, Mrs. Sally MacDonald, who searched references and tabulated data.

June 30, 1973
Richmond Hill, Ontario

THIRD CATALOGUE OF VARIABLE STARS IN GLOBULAR CLUSTERS

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 104 (47 Tucanae) α $00^h21^m.9$, δ $-72°21'$							
1	+ 36.8	−112.6	11.60	15.63	35487	212	Sp M, V
2	+ 64.7	−193.9	11.70	14.48	35645	203	Sp M, V
3	+ 328.4	+ 52.8	11.70	15.85	35468	192	Sp M, V
4	− 18.8	−160.4	12.50	14.0	35490	165	
5	+ 271.9	−284.6	13.0	13.7	36158	45	Sp M, V
6	+ 97.3	−103.8	13.0	13.6	36159	47	
7	+ 349.2	−113.0	13.0	13.7	36162	58	Sp M, V
8	+ 16.0	+ 57.0	12.4	14.0	35524	155	Sp M, V
9	− 108	− 78	13.6	14.7	36163.240	0.73652	mem, Sp, V
10	+ 72	+702	13.1	13.6		irr	
11	+ 306	+138	13.2	14.0		irr	
12	+1254	−348	13.89	14.45	36046.614	0.37143	f, Sp, V
13	− 301.95	−139.92					Wilkens
14	+ 8.25	+ 66.83					F&L
15						irr	W300
16							R18
17							W81
18			12.0	12.3			L168
19			11.0	11.6			R10
20			11.7	12.5			A1
21			12.0	13.0			A2
22			11.7	12.2			A4
23			11.7	12.2			A6
24			11.6	11.9			A8
25			11.6	11.9			A9
26			11.8:	12.1:			A13
27			11.9	12.2			A18
28			11.8	12.2			LR5

V15 found by Eggen, 1961; V17 Eggen, 1972; V16 Brooke, 1969. Unpublished V magnitudes given for vars. 18-28, discovered by Lloyd Evans and Menzies, marked on print (1973); their identifying numbers are given in the remarks column. W = Wildey (1961), R = Feast and Thackeray (1960). A field variable, HV 809, is shown by Jones (1973) to be a non-member.

Feast, Thackeray and Wesselink, MN 120.64 (1960); Feast and Thackeray, MN 120.463 (1960); Eggen, Royal Obs Bull 29.E86 (1961); Kurochkin, VS 13.248 (1961); Wildey, ApJ 133.430 (p) (1961); Rosino and Sawyer Hogg, IAU Trans 11B.301 (1962); Arp, Brueckel and Lourens, ApJ 137.228 (1963); Feast, ApJ 137.342 (1963); Tifft, MN 126.210 (1963); Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966); Brooke, Doctoral Thesis, Australian Nat'l Univ (1969); Eggen, ApJ 172.639 (1972); Lloyd Evans, Letter (1972); Jones, IAU Coll 21 (1973); Lloyd Evans and Menzies, IAU Coll 21 (p) (1973)

S55a, S57, S59, S61, A62, R62a, S62, P64, S64, R65, S69, F72

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 288 α $00^h50^m.2$, δ $-26°52'$							
1	−55	+79	13.5	14.1	25576	103	

Shapley, Star Clusters, p. 45 (1930); Oosterhoff, BAN **9**.397 (1943)
S55a, S59, R62c, S62, S69

NGC 362 α $01^h01^m.6$, δ $-71°07'$							
1	−246.2	− 67.6	14.9	16.1	23751.558	0.5850512	
2	+ 41.4	−204.4	13.0	14.5	24391.8	90 var	
3	+ 93.6	−143.2	14.6	16.1	23604.806	0.4744151	
4	− 50.2	− 27.3	14.0	15.8			
5	− 79.2	− 31.9	15.1	16.4	24025.729	0.4900846	
6	+ 82.4	+ 15.5	14.9	16.3	24461.642	0.5146080	
7	+131.1	− 21.2	14.8	16.0	24468.687	0.5285492	
8	+ 33.4	−308.5	15.0	16.5	24433.677	3.901447	
9	−400.4	+224.4	14.7	16.0	24404.670	0.5476126	
10	+282.8	−381.8	14.9	16.4	23315.643	4.20519	
11	−136.1	− 26.0	15.1	16.0			
12	− 30.4	−115.4	15.2	16.1	24391.839	0.65254518	
13	+ 14.5	+ 38.8	14.6	16.3			
14	− 23.8	− 66.8	14.8	16.2			
15	+151.3	−210.7					F&L

Bailey, HA 38.237 (p) (1902); Sawyer, HC 366 (1931), HC 374 (p) (1932); Kurochkin, VS 13.248 (1961); Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966); Eggen, ApJ **172**.639 (1972)
S55a, S59, S62, S64, L65, R65, S69

NGC 1261 α $13^h10^m.9$, δ $-55°25'$							
1	− 29.8	− 28.4					L&F
2	− 39.8	+ 34.9	16.05	17.25			L&F
3	+ 49.6	− 54.6	15.88	16.67			L&F
4	+ 31.8	− 36.1					L&F
5	− 34.5	− 5.0	16.1	17.0			L&F
6	+ 78.1	− 12.3	16.32	17.32			L&F
7	−149.3	+140.2	16.85	17.3			L&F
8	−133.7	−139.0	16.13	17.48			L&F
9	+ 37.9	− 38.8	16.85	17.15			L&F
10	+ 52.3	+ 70.6	16.17	17.43			L&F
11	− 89.0	+ 89.5	16.85	17.29			L&F
12	+ 87.1	− 10.5	16.35	17.42			Bartolini
13	− 77.1	− 96.0	16.79	17.35			Bartolini
14	− 53.5	− 70.7	16.22	17.23			Bartolini
15	−114.5	+129.1	15.21	15.86			Bartolini

Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966); Laborde and Fourcade, Cordoba Repr 127 (1966); Bartolini, Grilli and Robertson, IBVS 594 (1971); Bartolini, Grilli and Morisi, IBVS 649 (1972); Bartolini, Letter (1972)
S55b, R62b, S67, S69

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks

Palomar 1 α 03^{h}25^m.7, δ +79° 28′

No variables found.
Kinman and Rosino, ASP 74.499 (1962)
R61, S61

Palomar 2 α 04^{h}43^m.1, δ +31° 23′

No variables found.
Rosino and Pinto, IAU Coll 21 (1973)
R61

NGC 1851 α 05^{h}12^m.4, δ −40° 05′

1	+258.50	− 12.38	14.0	15.5			
2	− 41.25	+ 30.25	14.0	15.5			
3	− 38.50	+ 92.13					
4	+ 24.75	+ 35.75					
5	+ 41.25	+ 41.25					
6	− 74.25	− 8.25					
7	+ 4.13	− 8.35					
8	+ 28.88	+ 24.75	var?				
9	− 57.75	+ 49.50					
10	+ 46.75	−196.63					

Small change in coordinates of vars. 1 and 2 discovered by Bailey. Variable formerly noted as unpublished is considered to be included in above list of new vars. 3-10 discovered by Laborde and Fourcade.

Bailey, HB 802 (1924); Shapley, Star Clusters, p. 45 (1930); Laborde and Fourcade, Cordoba Repr 138 (p) (1966)

S55a, S59, R62c, S62, F&L63, FLA66, S69

NGC 1904 (Messier 79) α 05^{h}22^m.2, δ −24° 34′

1	+29.6	−199.6	var?				med 16.0
2	+78.3	− 68.3	14.2	14.80		SR	
3	+34.8	− 64.4	15.9	16.7	34032.40	0.73602	
4	+93.4	− 50.1	15.6	16.7	32877.50	0.63492	
5	−11.6	+ 20.2					
6	−70.8	+115.6	16.0	16.6	32940.25	0.33522	
7	+22.5	− 15.2					Tsoo Yu-hua
8	+ 7.1	− 11.7					Tsoo Yu-hua

Pickering, HC 18 (1897); Bailey, HA 38.238 (p) (1902); Rosino, Bologna Pubbl 5, 20 (p) (1952); Tsoo Yu-hua, Letter (p) (1965)

S55a, S59, S62, L65, R65, S67, S69

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 2298 α 06^{h}47^m.2, δ −35°57′							
1	+119.35	−37.40					F&L
2	− 30.53	−22.28					F&L
Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966) S55a, S59, R62c, S62, F&L63, S69							
NGC 2419 α 07^{h}34^m.8, δ +39° 00′							
1	+ 40	− 52	17.59	18.32		irr	
2	− 4	− 19					
3	+ 52	− 24	18.66	19.96			
4	+ 80	− 15	18.84	19.65			
5	+ 33	+ 47	18.75	19.72			
6	+ 56	−127	18.86	19.64			
7	+ 91	+ 87	18.69	19.77			
8	− 17	+ 41	17.50	18.10		irr	
9	− 32	+ 88	18.59	19.76			
10	+ 20	− 51	17.31	17.93		irr	
11	+ 95	− 8	18.55	19.81			
12	+133	+111	18.69	19.71			
13	+101	− 10	18.55	19.75			
14	−115	− 13	18.81	19.62			
15	+ 62	+ 40	18.62	19.76			
16	+ 47	+ 72	18.77	19.85			
17	+109	+111	18.65	19.75			
18	− 15	+114	17.84	18.53		irr	
19	−107	− 40	18.77	19.86			
20	− 28	+ 45	17.65	18.16		irr	
21	− 55	+ 30	18.76	19.74			
22	+109	− 5	18.60	19.84			
23	+ 27	+ 79					
24	−147	− 10	18.94	19.58			
25	− 59	+ 38	18.78	19.70			
26	− 70	− 50					
27	+ 19	−103	19.10	19.55			
28	−192	+ 59	18.72	19.78			
29	− 58	− 7	19.01	19.92			
30	− 26	+ 23					
31	+154	−146	19.08	19.53			
32	− 19	+ 48	18.60	19.71			
33	+ 47	− 17	19.11	20.13			
34	+ 21	+157	19.00	19.66			
35	+ 43	+ 8	18.88	20.00			
36	+ 23	+ 44	19.10	19.83			
Kinman has two RR Lyrae periods, 0.37 and 0.63 days. Baade, ApJ 82.396 (p) (1935); Rosino and Sawyer Hogg, IAU Trans 11B.301 (1962) S55a, S59, S62, R65, S69							

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 2808 $\alpha\ 09^h10^m.9$, δ -64° 39′							
1	+107.25	− 35.20					F&L
2	− 48.13	+ 34.10					F&L
3	+ 31.63	− 61.33					F&L
4	−191.13	+ 60.50					F&L
5	+ 39.05	− 66.00					F&L
6	+168.58	−291.50					F&L
7	+ 63.25	+ 60.50					F&L
8			14.87	15.92			Alcaino 27
9			15.68	16.96			Alcaino 35

Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966); Alcaino, Astr and Ap 15.360 (p) (1971)
S55a, S59, R62c, S62, S69

Palomar 3 $\alpha\ 10^h03^m.0$, δ +00° 18′

V1 on print — prob RR — B&S

Burbidge and Sandage, ApJ 127.527 (p) (1958)
S61, S62, S69

NGC 3201 $\alpha\ 10^h15^m.5$, δ −46° 09′

1	+ 59	− 118	14.56	15.66	39505.858	0.6048761	+
2	+ 29	− 117	14.61	15.60	28272.352	0.5326722	
3	+ 182	− 43	14.84	15.52	39504.76:	0.5994093	−
4	+ 155	+ 3	14.76	15.60	23198.539	0.6300006	
5	+ 42	− 24	14.40	15.54	39504.853	0.5015359	+
6	− 116	− 143	14.42	15.42	39506.796	0.5256131	−
7	− 91	− 189	14.88	15.40	39505.823	0.6303322	+
8	− 69	− 99	15.06	15.40	39504.816	0.6286280	+
9	− 51	− 91	14.86	15.57	23506.605	0.5266970	
10	− 181	+ 235	14.66	15.59	22429.597	0.5351571	
11	− 104	+ 112	14.82	15.36	39506.804	0.2990471	+
12	− 86	+ 108	14.50	15.53	23547.577	0.4955583	
13	− 160	+ 92	14.66	15.56	39506.720	0.5752145	+
14	− 156	+ 133	14.61	15.67	23961.495	0.5092897	
15	− 279	− 173	14.34	15.43	23164.572	0.5346644	
16	− 197	− 238	14.83	15.21	39504.819	0.365	
17	+ 11	− 25	14.80	15.52	39506.874	0.5655773	−
18	+ 23	− 24	14.73	15.54	39504.872	0.53	
19	+ 23	+ 317	14.40	15.50	39506.821	0.5250201	−
20	+ 39	+ 284	14.40	15.52	39505.816	0.5291064	+
21	+ 94	+ 135	14.74	15.62	39506.763	0.5666509	+
22	− 100	− 56	14.66	15.57	39506.825	0.6059842	+
23	− 49	− 50	14.75:	15.12:	39504.81	0.61	Companion
24	− 339	+ 17	14.40	15.52	39505.869	0.5889798	−
25	+ 93	+ 173	14.43	15.47	39505.818	0.5147963	+

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 3201 (continued)							
26	+ 219	− 140	14.87	15.70	39505.878	0.5689949	−
27	+ 58	− 323	14.08	15.32	39505.790	0.4842943	+
28	+ 66	− 48	14.70	15.60	39505.760	0.5786766	−
29	− 256	+ 113	15.12	15.48	39506.74:	0.343	
30	− 289	+ 272	14.29	15.49	39504.814	0.5158559	+
31	+ 182	+ 131	14.65	15.51	23505.620	0.5194894	
32	+ 195	+ 199	14.30	15.54	39504.900	0.5611656	+
33	+ 48	− 40	not var				
34	+ 296	+ 285	14.37	15.62	23547.577	0.4678883	
35	− 11	+ 121	14.90	15.45	22484.504	0.6155244	
36	− 108	− 11	14.68	15.2:	39505.794	0.242	Alt 0.323
37	− 68	− 74	15.04	15.40	39504.77	0.273	Alt 0.382
38	− 61	− 60	14.70	15.60	23877.612	0.5091616	
39	+ 41	+ 54	14.83	15.80	23181.537	0.4832092	
40	− 96	+ 68	15.10	15.56:	39504.90	0.642	Alt 0.385
41	+ 291	+ 28		15.55		0.66	
42	− 301	+ 197	14.26	15.40	39504.840	0.5382490	+
43	− 377	+ 15	14.80	15.39	23166.665	0.6761289	
44	+ 31	+ 67	15.01	15.66	23190.635	0.6107344	
45	+ 127	− 32	14.56	15.60	39505.859	0.5374165	+
46	− 396	− 510	14.56	15.35	23167.570	0.5431990	
47	+ 108	+ 245	14.78	15.42	39504.903	0.342:	Bℓ, Alt 0.51
48	− 252	+ 12	14.96:	15.36	39506.67:	0.336	Alt 0.252
49	− 38	+ 151	14.72:	15.46	39504.76:	0.5814870	+
50	− 13	+ 27	14.80	15.72	39506.88	0.565	
51	− 205	− 26	14.50	15.30	39506.813	0.5205454	+
52	+ 14	− 812	14.90	15.30	39505.78:	0.38:	
53	− 873	− 758	14.57	15.38	23191.540	0.5334705	
54	+ 671	− 804	14.71	15.8:	39506.776	0.5558721	+
55	− 338	+ 767	14.47	15.43	39504.915	0.607	
56	+ 246	+ 94	14.95	15.62	23164.591	0.5903376	
57	+ 288	− 72	14.74	15.58	39506.762	0.5934373	+
58	+ 346	− 80	14.94	15.45	23164.538	0.6220418	
59	− 490	− 70	14.28	15.28	39506.813	0.5177106	+
60	− 850	+ 95	14.08	15.38	39505.798	0.5035723	−
61	−1125	+ 175	14.12	15.59	39504.91	0.54	
62	−1060	− 186	14.29	15.49	39505.798	0.5697558	−
63	−1000	+ 59	14.36	15.39	23914.582	0.5680998	
64	− 646	+ 863	14.32	15.54	39504.815	0.5224218	+
65	− 544	+ 797	14.01	15.03	39506.71	1.660024	EA, Min, mem?
66	− 398	+ 289	14.90	15.27	39506.78	0.284	
67	− 374	− 120	14.75:	15.31	39506.70:	0.329	Alt 0.494
68	− 283	+ 846				long	
69	− 221	+ 995	14.34	15.50	23914.575	0.5122704	
70	− 221	− 13	not var				
71	− 182	− 117	14.35	15.39	39506.765	0.6011859	+
72	− 161	+ 596	15.00	15.24		0.36?	

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 3201 (continued)							
73	− 128	+ 86	14.40	15.60	39504.860	0.5199500	+
74	− 94	+ 36	not var				
75	− 81	+ 147	not var				
76	− 62	− 42	15.16	15.72	39506.74	0.343	Alt 0.52
77	− 10	− 52	14.64	15.50	22429.592	0.5676648	−
78	− 8	− 143	14.48	15.48	39504.83	0.514	
79	+ 10	− 101	not var				
80	+ 60	+ 23	14.82	15.60	39505.79	0.58	
81	+ 96	− 153					
82	+ 161	− 166	not var				
83	+ 177	+ 172	14.44	15.62	23190.624	0.5451918	−
84	+ 358	+ 703	14.65	15.43	22077.566	0.5136787	
85	+ 569	− 403	not var				
86	+ 611	− 315	not var				
87	+1013	− 460	14.65	15.30	23164.633	0.6038866	
88	+ 234	+1086	14.48	15.61	39504.86	0.57	Wilkens 1
89	+1404	− 180	14.90	15.38	39505.83	0.369	Wilkens 2
90	− 24	+ 06	14.8:	15.65	39504.73:	0.61	Wilkens 3
91	−1524	+1170	14.64	15.10	39504.98	0.345	Wilkens 4
92	− 150	− 30	14.48	15.50	39506.80	0.523	Wilkens 5
93	+1986	− 192				0.48?	Wilkens 6
94	−2862	+1824				RR	Wilkens 7
95	+1860	+2580				RR	Wilkens 8
96	−2790	− 468	14.50	15.50	39506.86	0.59	Wilkens 9

Wilkens no. 10 = V39. Kukarkin considers Wilkens' new variables are cluster members, forming a large corona, and says identifications of vars. 6, 11, 45, 52, 57, 68 and 81 are erroneous in FLA66.

Wilkens, MVS 3.75 (1965); Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966); Kukarkin, AC 426.4 (1967), AC 428.1 (1967), AC 637.4 (1971), VS 17.610 (1971), Letter (1971)

S55a, S57, S59, S61, R62a, S62, S64, L65, R65, St66, S67, S69, S70

Palomar 4 $\alpha\ 11^{h}26^{m}.6$, $\delta\ +29°15'$

1	−12	−4	17.7	20	35922	130.50	Rosino
2	−43	−3	17.6	19.3	35938	109.30	Rosino

Rosino, Asiago Contr 85 (1957); Burbidge and Sandage, ApJ 127.527 (1958); Rosino and Pinto, IAU Coll 21 (1973)

R57, S59, R61, S61, S62, S69

NGC 4147 $\alpha\ 12^{h}07^{m}.6$, $\delta\ +18°49'$

1	−100.1	− 45.7	16.36	17.76	35546.544	0.5003860	
2	− 20.2	− 28.8	16.46	17.64	35538.485	0.49306	
3	− 28.5	− 35.3	16.68	17.24	35538.591	0.280542	
4	+ 1	+ 18	16.27	17.29	34805.859	0.30097	
5	+ 14.9	+ 2.7	17.0	17.4		0.34125:	Newburn
6	+ 31.2	+ 28.4	16.29	17.67	34805.675	0.61860	S&W

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 4147 (continued)							
7	+ 4.6	+ 7.4	16.4	17.6	34805.924	0.51294	S&W
8	+ 8.6	+ 2.3	16.9	17.5		0.3897:	S&W
9			prob not var				S&W print
10	− 47.8	− 45.6	16.96	17.54	35538.528	0.352314	S&W
11	− 12.2	− 41.9	16.72	17.30	35538.670	0.38739	S&W
12	+ 5.1	− 4.2	16.6	17.6		0.5:	S&W
13	+ 0.1	− 19.0	16.8	17.3		0.3759:	S&W
14	+ 8.4	− 0.2	16.9	17.5		0.5255:	Newburn
15	+ 9.2	− 7.8	16.8	17.3		0.3354:	Newburn
16	+ 14.5	+ 7.7	16.8	17.1		0.2775:	Newburn
17	+ 63.7	+143.3	16.72	17.34	35538.430	0.37473	Newburn

Five field variables, Baade.

Baade, AN 244.153 (1931); Sandage and Walker, AJ 60.230 (p) (1955); Newburn, AJ 62.197 (1957); Mannino, Asiago Contr 87 (1958)

S55a, S57, S59, S61, R62a, S62, L65, R65, S69

NGC 4372 $\alpha\ 12^h23^m.0$, $\delta -72°24'$

1	−739.75	− 42.08	F&L
2	+612.15	−382.25	F&L

Wilkens, Letter (1961); Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966)

S55a, S57, S59, S61, R62c, S62, F&L63, S69

NGC 4590 (Messier 68) $\alpha\ 12^h36^m.8$, $\delta -26°29'$

1	−283	+109	15.55	16.11	33421.357	0.349604
2	−168	− 44	15.05	16.29	33661.66	0.578169
3	−140	+ 91	15.40	16.15	33661.66	0.4158
4	−118	−132	15.65	16.20	33423.273	0.396367
5	− 53	+169	15.47	16.11	33423.297	0.282116
6	− 54	+ 17	15.75	16.07	33422.413	0.368523
7	− 51	− 78	15.71	16.07	33423.478	0.387945
8	− 35	−134	15.74	16.13	33422.359	0.390402
9	− 30	+ 40	15.43	16.28	33422.257	0.57900
10	− 24	− 14	15.28	16.62	33423.224	0.55112
11	− 17	−113	15.65	16.16	33423.295	0.36489
12	− 12	00	15.07	16.23	33423.333	0.6162
13	− 4	− 57	15.72	16.11	33423.385	0.361740
14	− 2	+218	15.02	16.25	33421.437	0.55679
15	+ 10	+ 59	15.65	16.36	33423.360	0.37220
16	+ 10	+ 78	15.65	16.22	33423.289	0.381967
17	+ 17	− 74	15.65	16.60	33418.293	0.66693
18	+ 18	− 96	15.69	16.19	33423.327	0.367346
19	+ 32	+ 70	15.65	16.20	33421.404	0.39206
20	+ 33	−114	15.69	16.14	33421.293	0.385764
21	+ 46	+ 8	15.82	16.60	33423.358	0.37241
22	+ 61	− 22	15.30	16.52	33421.424	0.563469
23	+ 65	+380	14.85	16.13	33423.198	0.6588799

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 4590 (continued)							
24	+ 72	− 8	15.64	16.13	33422.268	0.376500	
25	+140	+123	15.00	16.15	33423.328	0.641556	
26	+157	− 45	15.63	16.11	33799.370	0.413217	
27	+381	+263	10.2	17.4	33661.	320	FI Hya, f
28	+439	+159	14.81	16.18	33423.292	0.6067750	
29	+283	−153	15.65	16.15	33419.416	0.395253	
30	+112	− 77	15.60	16.20	33422.442	0.73362	
31	−109	+ 96	15.49	16.10	33423.310	0.399658	
32	−330	−639			33422.362	0.58692	van Agt
33	+ 89	+ 59			33422.317	0.38523	van Agt
34	+268	+216			33422.314	0.39696	van Agt
35	− 35	− 52			33421.340	0.71608	van Agt
36	− 38	− 52			33422.374	0.6998	van Agt
37	− 21	+ 20			33423.317	0.38553	van Agt
38	− 22	− 29			33423.251	0.3826	van Agt
39	− 50	− 8					T,R&O
40	− 1	− 52					T,R&O
41	+ 4	+ 80					T,R&O
42	− 3	+ 37					T,R&O

Five new field variables, Terzan et al. (1973)

Rosino and Pietra, Bologna Pubbl **6**, 5 (1954); van Agt and Oosterhoff, Leiden Ann 21.253 (p) (1959); Terzan, Rutily and Ounnas, IAU Coll 21 (p) (1973)

S55a, S57, S59, S61, R62a, L65, R65, S69

NGC 4833 $\alpha\ 12^h56^m.0, \delta\ -70°36'$

1	−264	+468	15.32	15.86	29375.251	0.750101	RY Mus
2	+378	−354	13.0	16.2:	26166	333.7	RZ Mus, V, f
3	0	+ 6	15.46	15.9	29363.248	0.744526	
4	0	+ 24	15.24	15.88	29381.249	0.655536	
5	+132	− 66	15.4	16.0	29381.240	0.629414	
6	+120	+120	15.3	15.9	29381.297	0.653967	
7	+ 72	− 6	15.49	16.05:	29374.256	0.668422	
8	−168	+498	15.59	15.79			
9	− 42	− 6	14.5	15.16	28035	87.7:	
10	+ 72	+414	15.14	15.9			
11	−336	−828	14.5	16.0:	24320	303.8	
12	+ 19.2	+ 13.7					F&L, RR?
13	+272.2	− 30.2					F&L, RR?
14	− 13.7	− 38.5					F&L, RR?
15	− 15.1	− 57.7					F&L, RR?
16	− 76.5	+151.2				irr	F&L, red

Menzies confirms variability of all these stars, with small variation for V16. He lists eight new suspected variables, Menzies B57, B84, B105, B121, B193, C80, C308 (all appear to be RR Lyr), and D199 (perhaps Pop II Cepheid), identified on print.

Feast, Obs **86**.120 (1966); Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966); Menzies, MN 156.207 (p) (1972)

S55a, S59, R62a, S62, L65, R65, S67, S69

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 5024 (Messier 53) $\alpha 13^h10^m.5$, $\delta +18°26'$							
1	+ 9.6	−171.0	15.75	17.20	23083.408	0.6098240	+
2	− 78.0	−183.6	16.30	16.90	22787.498	0.3861005	
3	− 60.6	−138.0	16.10	17.10	23113.388	0.6306134	0
4	−169.5	−156.6	16.41	16.84	23113.482	0.3851900	+
5	−237.0	−258.0	15.75	17.10	23143.336	0.6394247	−
6	+123.6	+ 13.5	16.00	17.20	23083.457	0.66401573	−
7	+ 79.5	+ 83.5	15.85	17.15	23145.418	0.5448396	+
8	+ 72.0	+ 60.0	16.10	17.10	22762.553	0.61553333	−
9	+ 67.5	− 40.5	15.90	17.10	23145.523	0.6003694	−
10	−138.6	+ 54.0	15.85	17.05	23143.446	0.6082562	0
11	−143.4	− 58.5	15.85	17.0	23113.525	0.6299592	+
12	+409.5	+187.5	15.90	17.15	23113.579	0.61258094	−
13	+462.0	−299.7	15.75	17.10	23143.419	0.6274424	−
14	+354.6	−207.0	15.80	17.10	23143.363	0.5454029	−
15	+248.4	+228.0	16.39	16.67	23113.361	0.3087107	+
16	−136.5	−202.5	16.43	16.90	23113.402	0.3031728	
17	−214.5	+114.0	16.29	16.80	22762.612	0.3814992	
18	− 96.0	+ 12.6	15.83	16.42			
19	+165.6	− 42.0	16.34	16.85	22789.465	0.3918418	
20	+188.4	−351.6	16.32	16.81	23113.615	0.3844212	−
21	+437.4	− 27.0	16.32	16.81	22790.410	0.3384650	
22	− 53.4	−288.0	16.56	16.85	var?		
23	+ 96.0	− 89.7	16.34	16.88	23113.460	0.3658077	
24	−118.5	− 29.2	15.71	16.43		3.?	
25	+130.3	+ 31.7	16.05	17.0	23113.392	0.70516256	−
26	−288.0	−279.9	16.20	16.85	23113.343	0.3911166	
27	−203.8	−157.9	16.0	17.10	23083.620	0.6710599	0
28	−181.4	+459.0	15.65	17.05	23113.183	0.63279704	+
29	+125.4	− 79.5	16.56	17.04	22808.305	0.8232463	+
30	+ 57.7	−482.8	15.6	17.6	31223.384	0.53548466	Bℓ, 37^d
31	+ 60.6	− 0.1					
32	−111.9	− 86.6	16.26	16.65	22790.475	0.3901324	
33	−165.0	+ 12.2					
34	−144.0	−216.7	16.48	16.70	not var		
35	+104.1	+153.2	16.25	16.95	23113.327	0.3726739	0
36	+120.3	+306.5	16.33	16.71	23113.698	0.3732511	
37	− 44.0	+ 62.2	15.68	16.48			
38	+ 21.3	−143.2	16.0	17.0	23083.773	0.7057873	+
39	−234.0	+212.5	16.84	17.26	not var		
40	+ 8.9	+111.5					
41	+ 19	+ 66					
42	− 67	+ 17	15.54	16.33			
43	− 34	+ 53					
44	+ 53	− 2	15.20	15.99			
45	− 5	− 36					
46	− 12	+ 34					
47	− 68.7	+138.0	16.20	16.80	37763.435	0.35051	Margoni

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 5024 (continued)							
48	+ 4.68	+ 11.58	16.63	17.53	34480.91	0.3327660	Cuffey 47
49	+ 1.05	+ 4.39	15.25	15.65	34478.5	111.6	Cuffey 48
50	− 2.28	− 1.34	15.22	15.52	34482.0	55.4	Cuffey 49

Cuffey, AJ **67**.574 (1962); Margoni, Asiago Contr 150 (1964); Cuffey, AJ **70**.732 (1965); Margoni, Asiago Contr 170 (1965), Bamb Kl Veröff **4**,40.249 (1965); Wachmann, Astr Abh Hoffmeister p. 121 (1965); Cuffey, AJ **71**.514 (1966); Margoni, Asiago Contr 198 (1967); Wachmann, Berg Abh **8**.114 (1968)

S55a, S57, S59, S61, R62a, S62, S64, L65, R65, S67, C&S69, S69, S70

NGC 5053 $\alpha\ 13^h13^m.9$, $\delta\ +17°57'$

1	−380	+158	15.8	16.5	37343.456	0.6471748	
2	−193	− 3	15.9	16.6	37370.575	0.3789561	+
3	+140	+138	15.8	16.6	37370.470	0.5929430	
4	+ 31	−114	15.8	16.5	37371.454	0.6670627	
5	+220	−220	16.0	16.6	37370.641	0.7148605	
6	+126	+ 77	16.0	16.5	37370.556	0.2921978	
7	− 87	+169	15.9	16.5	37370.469	0.3519300	+
8	+117	+ 50	15.9	16.5	37371.452	0.3628410	−
9	−199	+382	16.0	16.6	37371.407	0.7402201	
10	+ 94	+ 56	16.10	16.45	37370.427	0.4373803	Alt P?
11			16.01	16.47			Perova

Perova's var., V11, is Baade's comparison star c.

Perova, VS **14**.255 (1962); Mannino, Bologna Pubbl **8**, 12 (1963)

S55a, S59, R62a, S62, S64, L65, R65, C&S69, S69

NGC 5139 (ω Centauri) $\alpha\ 13^h23^m.8$, $\delta\ -47°13'$

1	− 416.16	+298.89	11.05	12.45	30027.0	29.3479*	0, Sp, F, V, mem
2	− 340.00	+238.51	13.06	16.12	30139.4	235.74	0, f
3	− 507.93	+167.43	14.11	15.14	27000.42	0.8412403	−
4	− 337.61	+262.10	14.96	15.25	27000.32	0.6273172	+
5	− 282.75	+328.29	14.48	15.49	27000.44	0.5152823	+
6	− 162.43	+252.95	13.84	15.24	27010.1	73.513	0, prob f
7	+ 153.19	+879.15	14.15	15.33	27000.20	0.7130181	+
8	+ 629.43	+ 16.20	14.03	15.35	27000.31	0.5212859	+
9	− 473.17	+137.14	14.31	15.28	30000.04	0.5233301	0
10	− 397.76	+244.48	14.43	14.95	27000.06	0.374956	−
11	− 158.63	+338.73	13.90	15.04	27000.19	0.5648246	−
12	− 193.16	+274.34	14.43	14.95	27000.08	0.3867639	0
13	− 487.26	+199.54	13.96	15.14	30000.50	0.6690507	0
14	− 473.51	−627.56	14.56	15.17	30000.29	0.3771102	0
15	− 194.09	+242.62	13.70	14.39	27000.40	0.8106152	+
16	+ 517.05	−536.81	14.46	15.04	27000.07	0.3301802	+
17	+ 522.24	+200.00	14.18	14.61	30062.2	64.725	irr, prob f
18	+ 596.64	+220.15	14.06	15.35	30000.42	0.6216671	0

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 5139 (continued)							
19	+ 444.14	+ 32.44	14.76	15.30	30000.11	0.2995525	0
20	+ 280.88	+ 32.06	14.09	15.28	27000.61	0.6155528	+
21	− 355.75	+162.07	14.20	14.81	30000.10	0.380810	
22	+ 552.18	−330.22	14.63	15.17	27000.22	0.3965212	
23	+ 2.54	+240.71	14.26	15.39	27000.17	0.5108653	+
24	+ 524.71	−336.96	14.57	15.04	27000.08	0.4622076	+
25	− 210.77	+ 17.48	13.98	15.07	30000.50	0.5885146	0
26	− 229.58	+101.21	14.36	15.06	27000.15	0.7847138	+
27	− 205.47	+ 24.11	14.50	15.19	30000.02	0.6157067	0
28			not var				
29	− 193.25	− 6.45	12.39	13.50	30008.98	14.73383	0, Cep, mem
30	− 307.92	− 75.01			30000.21	0.403988	0
31			not var				
32	+ 174.39	+420.01	13.87	15.20	27000.39	0.6204298	−
33	− 554.54	− 24.00	14.16:	15.25:	27000.52	0.6023334	−
34	− 396.87	−269.04	14.10:	15.00::	27000.55	0.7339428	+
35	+ 71.70	+365.07	14.43	15.00	27000.00	0.3868382	−
36	+ 246.11	+789.42	14.62	15.17	30000.26	0.379846	0
37			not var				
38	+ 169.10	−470.37	14.45	15.20	27000.01	0.7790474	+
39	+ 741.86	−365.80	14.48	15.08	30000.21	0.3933505	0
40	− 220.99	−125.30	13.95	15.15	30000.11	0.6340925	0
41	+ 151.80	−142.18	14.03	15.06	27000.53	0.6629590	+
42	+ 0.21	− 50.21	12.5	14.9		149.4	
43	+ 119.23	+103.16	13.27	14.29	30000.65	1.156706	0, Cep, mem
44	− 243.40	−354.05	13.67:	14.65:	30000.48	0.5675440	0
45	− 764.48	+ 80.97	14.18	15.37	27000.09	0.5891301	+
46	− 770.61	+170.11	14.43	15.44	27000.60	0.6869406	+
47	− 504.32	+269.26	14.07	14.60	27000.15	0.4851319	−
48	− 86.54	−104.54	12.95	13.80	30003.6	4.47227	0, Cep, mem
49	− 391.98	−553.77	14.40	15.52	30000.36	0.6046505	0
50	− 530.75	+ 65.40	14.32	14.90	30000.20	0.3861960	0
51	− 36.85	+258.73	13.86	15.16	27000.08	0.5741332	+
52	− 112.85	+ 36.47	13.60	14.22	30000.28	0.6603703	0
53	− 482.79	−447.74	13.30	13.87		32.7	irr, Alt 70
54	− 229.39	+592.76	14.33	15.22	27000.30	0.7728973	+
55	− 617.73	−816.68	14.50	15.50	27000.11	0.5817244	−
56	− 515.93	−541.96	14.56	15.57	27000.42	0.5680098	−
57	+ 635.72	−493.26	14.52	15.16	27000.44	0.7944181	+
58	− 335.44	+277.68	14.49	14.74	30000.28	0.3699124	0
59	− 282.90	− 65.84	14.20	15.18	30000.41	0.5185122	0
60	− 108.42	−247.33	13.24	14.47	30001.00	1.349464	0, Cep, mem
61	+ 280.44	+ 68.07	13.65	14.42	30001.59	2.273564	0, Cep, mem
62	− 199.80	+ 45.28	13.88	15.10	27000.31	0.6197945	+
63	− 996.82	−491.46	14.59	15.17	27000.24	0.8259432	+
64	− 448.01	−457.49	14.54	15.14	30000.24	0.344621	+
65	− 454.49	−474.32	14.72:	15.17:	30000.022	0.06272267	0, f, RRs

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 5139 (continued)							
66	− 133.37	+375.15	14.46	14.95	27000.24	0.4074106	+
67	− 178.11	+593.57	14.18	15.28	27000.41	0.5644510	+
68	− 338.18	+545.12	14.15	14.67	30000.1	0.534708	0
69	− 965.76	+530.94	14.14	15.35	27000.24	0.6532208	+
70	+ 417.83	−304.65	14.62	15.11	30000.2	0.390596	0
71	+ 220.39	+ 47.13	14.38	14.92	30000.2	0.3574826	0
72	+ 477.85	+734.87	14.44	15.10	27000.17	0.3845221	+
73	− 532.49	+750.76	14.00	15.32	27000.42	0.5752151	+
74	+ 215.47	+664.83	14.10:	15.29:	27000.43	0.5032480	+
75	+ 341.44	+591.55	14.52	15.07	30000.16	0.4283681	0
76	+ 113.31	+511.81	14.21:	14.72:	27000.17	0.3378487	+
77	+ 352.29	+392.42	14.39	14.85	30000.10	0.4260045	0
78	+ 586.10	+146.68	14.17	14.84	33929.972	1.16812901	−, EA, Min, mem
79	+1000.12	− 51.02	14.26	15.39	27000.23	0.6082758	+
80	+1304:	−108:	14.1:	14.8		0.45	Alt 0.31
81	+ 511.36	+228.72	14.39	14.93	27000.14	0.3894005	+
82	+ 499.94	+126.98	14.47	15.00	30000.12	0.335931	0
83	+ 226.09	+424.66	14.50	15.07	27000.29	0.3566071	+
84	−1202.81	− 74.70	14.37:	15.10:	30000.33	0.5798732	0
85	−1010.51	+307.98	14.33	15.13:	27000.10	0.7427583	+
86	+ 293.14	+147.26	13.96	15.18	27000.32	0.6478337	+
87	+ 113.68	+184.13	14.40	14.90	30000.04	0.3965978	0
88	+ 98.13	+203.28	14.01	14.81	27000.22	0.6901959	+
89	− 2.95	+159.29	14.47	14.97	30000.29	0.374948	0
90	− 5.30	+137.09	13.81	14.73	27000.48	0.6034020	+
91	+ 43.72	+144.35	14.25	14.91	27000.18	0.8951197	
92	− 317.86	+446.38	14.10:	14.68:	30000.00	1.345044	0, Cep, mem
93			not var				
94	− 504.09	+355.09	14.58:	14.99:	30000.20	0.2539334	0
95	− 824.80	− 11.05	14.51	15.02	27000.39	0.4050201	+
96	− 71.20	+ 97.06	13.93	14.82	27000.08	0.6245320	+
97	+ 225.50	+187.93	14.11	15.16	27000.65	0.6918907	+
98	+ 198.25	+102.38	14.57	15.09	30000.19	0.2805649	0
99	+ 160.35	+ 50.36	13.77	14.90	37000.59	0.766140	+
100	+ 179.49	+ 65.68	14.05	15.05	27000.48	0.5527119	+
101	+ 444.11	− 73.28	14.46	14.90	26523.291	0.3408843	
102	+ 361.83	− 94.10	14.16	15.22	27000.13	0.6913899	+
103	+ 283.14	+ 2.35	14.46	14.80	30000.02	0.3288489	0
104	+ 822.98	−309.01	14.52	14.94	37000.51	0.867280	−
105	+ 603.23	−246.92	14.70	15.25	27000.14	0.3353345	+
106	+ 130.35	+ 26.92	13.88	15.02	27000.22	0.5699061	−
107	+ 279.83	−139.13	14.07	15.39	27000.07	0.5141002	+
108	+ 185.66	− 46.36	13.84	14.81	27000.24	0.5944553	+
109	+ 153.91	− 57.13	13.99	15.03	27000.67	0.7440618	·
110	+ 158.94	− 87.08	14.41	14.96	26524.256	0.3221021	
111	+ 27.26	− 0.30	14.18	14.80	27000.02	0.7629905	+
112	+ 79.83	−103.36	13.92	14.92	30000.07	0.4743558	0

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 5139 (continued)							
113	+ 99.99	−187.65	13.94	15.22	27000.39	0.5733636	+
114	+ 38.08	−101.15	14.00	14.75	26470.416	0.6753065	
115	− 345.49	−336.14	14.12	15.30	27000.14	0.6304638	−
116	− 109.66	+ 33.71	14.12	14.77	30000.37	0.7201327	0
117	− 267.73	− 40.22	14.40	14.92	30000.17	0.4216616	0
118	− 58.87	− 98.67	13.88	15.02	30000.03	0.6116283	0
119	− 82.04	−157.45	14.51	14.83	26472.319	0.3058774	
120	− 211.29	−247.61	14.26	15.23	27000.51	0.5485746	−
121	− 184.36	−189.58	14.48	14.81	27000.00	0.3041811	+
122	− 162.92	−261.41	13.99	15.17	27000.06	0.6349267	+
123	+ 46.11	−512.55	14.42	14.91	26473.331	0.4739051	
124	+ 78.88	−626.81	14.37	14.97	30000.02	0.3318607	0
125	+ 23.74	−742.59	14.04	15.33	27000.26	0.5928884	+
126	+ 822.95	−730.44	14.45	14.97	30000.17	0.3418905	0
127	− 880.16	+ 4.31	14.60	15.12	30000.03	0.3052736	0
128	− 289.77	− 92.09	14.25	14.86	27000.43	0.8349478	+
129	+ 192.02	− 25.83	14.18	14.74			f
130	− 366.17	+900.99	14.13	15.49	30000.38	0.4932499	0
131	− 165.05	− 59.95	14.40	14.86	27000.19	0.3921558	−
132	− 72.44	− 29.31	13.97	14.96	26469.386	0.6556410	
133	−1914.22	+1053.78	13.74	14.53	30000.07	0.31709593	0, EW, Min
134	− 942.87	+ 972.72	14.12	15.32	30000.57	0.6529026	0
135	− 184.88	− 37.25	13.87	14.85	26470.314	0.6325795	
136	− 154.26	+ 60.08	14.22	14.64	30000.0	0.3919136	0
137	− 149.54	+ 96.23	14.38	14.90	30000.29	0.3342179	0
138	− 111.12	− 187.55	12.5	13.6		74.6: irr.	
139	− 86.94	+ 65.18	14.00	14.90	26462.404	0.6768666	
140	− 42.65	− 86.80				short	
141	− 55.47	− 47.46	14.05	14.75	irr	0.6975651	
142	− 37.35	− 2.56	14.2	14.8		short	
143	− 37.45	+ 71.40	14.24	14.77	26470.394	0.8207020	
144	− 33.28	+ 22.44	14.33	14.81	26454.329	0.8353054	
145	+ 49.07	− 148.51	14.40	14.87	30000.15	0.373139	0
146	+ 65.96	− 48.03	13.87	14.77	26469.386	0.6331021	
147	+ 298.70	− 151.04	14.35	14.80	30000.34	0.4226989	0
148	+ 299.20	+ 44.21	12.9	13.8		90: irr.	
149	+ 477.33	+ 894.18	14.03	15.11	30000.42	0.6827281	0
150	+ 543.18	− 442.23	14.07	14.94	30000.7	0.8991997	0
151	+1010.06	+ 753.35	14.42	14.84	30000.1	0.4077838	0
152	+ 13.84	− 48.83	12.8	13.7		124:	irr
153	+ 34.46	+ 136.32	14.48	14.88	30000.23	0.386445	0
154	+ 169.59	− 113.20	14.55	14.72	30000.10	0.322407	0
155	+ 75.25	+ 237.31	14.43	14.88	30000.3	0.413919	0
156	+ 15.06	− 191.94	14.41	14.83	30000.34	0.3591887	0
157	+ 1.77	+ 82.58	14.42	14.79	26523.370	0.4064970	
158	− 10.58	− 119.80	14.32	14.74	26472.442	0.3673350	
159	−2039.94	− 891.45	14.39	14.96	30000.0	0.343101	0

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 5139 (continued)							
160	− 711.13	+ 969.21	14.51	15.15	30000.1	0.397276	0
161	− 96.81	− 129.27	13.3	13.8		irr	
162	− 392.40	− 252.39	12.9	13.6		irr	est now
163	− 575.24	+ 499.91	14.59	14.88	30000.0	0.3132294	0
164	+ 152.75	+ 478.38	13.7	14.0		37: †	Red
165	− 69.92	+ 104.59					
166	− 2.89	+ 144.71					
167	− 352.63	− 321.43					
168	− 543.66	− 201.42	14.96	15.46	30000.1	0.321295	0
169	+ 347.5	+ 278.7	14.61	14.85	32323.35	0.46926	Belserene
170						irr	Eggen, Herst 53
171	−2280	+2520				RRa	Wilkens 1
172	+ 720	+1440				RRa	Wilkens 2
173	+1800	+ 660				RRa	Wilkens 3
174	+ 780	−2040				1.8984	Wilkens 4, E
175	−2640	−3000					Wilkens 5
176	+ 144	− 66				RRc	Wilkens 6
177	+1380	− 480				RRb	Wilkens 7
178	+3120	+ 600				RRb	Wilkens 8
179	−1800	−2940				RRb	Wilkens 9
180	−1500	− 720				RRc	Wilkens 10
181	+1925	−1216				0.58836	Wess 2
182	+3355	+1292				0.54539	Wess 12
183	+1744	− 116				0.29605	Wess 13

* This variable appears intermediate between W Vir and RV Tau types, with alternate P $58^{d}.7$.
† Period from Dickens (1972).

Wilkens now considers his vars. 1, 5, 8, 9 also members (Letter, 1972), nos. 11–15 suspected. Wesselink has one field EW.

Belserene, Rutherfurd Contr 33.1, 43 (1956), AJ 64.58 (1959); Thackeray, Obs 80.226 (1960); Eggen, Royal Obs Bull 29.E73 (1961); Kurochkin, VS 13.248 (1961); Belserene, AJ 69.475 (1964); Dickens and Saunders, Royal Obs Bull 101.E101 (1965); Geyer, AG Mitt p.96 (1965); Geyer and Szeidl, Bamb Kl Veröff 4, 40.63 (1965); Harding, Royal Obs Bull 99.E65 (1965); Wilkens, MVS 3.72 (1965); Oosterhoff and Walraven, BAN 18.387 (1966); Ponsen and Oosterhoff, BAN Suppl 1.3 (1966); Woolley, Royal Obs Ann 2 (1966); Dickens and Carey, Royal Obs Bull 129 (1967); Geyer, ZAp 66.16 (1967); Wilkens, MVS 4.93 (1967); Jones, MN 140.265 (1968); Sistero, IBVS 316 (1968); Wilkens, La Plata Bol 12 (1968); van Albada, AAS Bull 1.366 (1969); Sistero, Fourcade and Laborde, IBVS 402 (1969); Wesselink, Letter (1969); Geyer and Szeidl, Astr and Ap 4.40 (1970); Geyer, IAU Coll 15.235 (1971); Dickens, Letter (1972); Dickens, Feast and Lloyd Evans, MN 159.337 (1972); Eggen, ApJ 172.639 (1972); Feast, Preprint (1972); Geyer, AG Mitt 31.168 (1972); Wesselink, unpub (1972); Wilkens, Letter (1972)

S55a, S57, S59, S61, A62, R62a, S62, P64, S64, L65, R65, FLA66, St66, S67, C&S69, S69, S70

NGC 5272 (Messier 3) $\alpha\ 13^{h}39^{m}.9$, $\delta\ +28°38'$								
1	−	5.2	−	128.5	14.68	15.92	36692.336	0.5206250	−
2	+	15.8	+	52.6					
3	+	57.9	−	66.0	14.75	16.00	15021.225	0.5582053	

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 5272 (continued)							
4	− 43.5	− 8.8	14.9	16.0			
5	+ 261.0	− 22.3	14.71	16.15	15021.239	0.5058940	Bℓ
6	− 123.9	+ 60.1	14.87	16.21	36669.320	0.5143228	+
7	− 4.8	+ 87.2	14.69	16.25	15021.064	0.4974290	
8	− 81.7	− 23.4	14.37	15.4			Confirmed
9	− 291.4	− 207.8	14.95	16.28	36668.502	0.5415641	−
10	+ 153.6	+ 138.0	15.06	16.15	36658.470	0.5695185	−
11	− 152.6	− 209.7	14.75	16.17	36699.491	0.5078918	cst
12	− 3.8	− 145.4	15.23	15.83	36687.336	0.3178890	
13	− 26.0	− 137.5	14.79	15.96	36702.398	0.4830302	− RR Binary?
14	− 49.0	− 161.0	14.95	16.19	36668.549	0.6359019	+
15	− 90.8	− 273.2	14.87	16.26	36666.565	0.5300794	+
16	− 301.4	− 93.1	14.93	16.31	36687.369	0.5115075	−
17	+ 142.4	− 440.4	15.20	16.20	36668.543	0.5761417	+, Bℓ
18	+ 97.6	− 295.3	14.86	16.30	36661.578	0.5163623	Bℓ
19	+ 350.5	− 245.6	15.56	16.15	36639.520	0.6319796	−
20	+ 333.5	− 271.6	14.85	16.25	36668.555	0.4912411	
21	+ 346.9	+ 17.9	14.81	16.27	30000.415	0.5157336	+
22	+ 190.2	− 10.7	14.98	16.20	36660.536	0.4814208	
23	− 113.0	+ 279.2	15.07	15.80	15021.082	0.5953756	
24	− 147.6	+ 10.4	15.06	16.07	15021.563	0.6633494	cst
25	− 124.4	− 31.4	14.66	16.07	15021.089	0.4800510	+
26	− 177.4	− 43.0	14.88	16.04	15021.239	0.5977452	−
27	− 110.2	− 102.8	15.07	16.11	15021.566	0.5790912	
28	− 25.0	− 105.8	14.92	15.88	24290.335	0.4706364	
29	− 65.2	− 73.6					
30	− 36.5	+ 58.0	15.18	15.92	22760.635	0.5120902	
31	+ 33.1	+ 65.1	14.43	15.65	15021.542	0.5807216	−
32	+ 11.8	+ 60.1	14.58	15.68	15021.108	0.4953518	−
33	+ 70.5	− 89.1	14.78	15.90	15021.217	0.5252237	−, Bℓ
34	+ 135.4	+ 170.2	15.08	16.16	36668.467	0.5591012	Bℓ
35	− 107.3	− 278.2	15.04	16.10	15021.032	0.5306059	Bℓ
36	+ 172.0	− 35.4	14.78	16.26	36692.525	0.5455855	+
37	− 236.7	+ 164.7	15.34	16.12	30000.241	0.3266384	−
38	− 203.0	+ 127.7	14.74	16.16	24290.304	0.5580276	−, Bℓ
39	− 243.6	+ 121.4	15.14	16.23	15021.073	0.5870766	Bℓ
40	− 271.2	+ 112.4	15.01	16.32	30000.397	0.5515416	
41	− 93.3	+ 54.0	15.22	16.23	15021.441	0.4850462	
42	− 78.6	+ 41.0	14.40	15.68	15021.515	0.5901852	
43	+ 99.9	+ 24.7	14.40	15.80	15021.191	0.5405790	Bℓ
44	+ 170.0	+ 99.4	14.84	16.04	15021.368	0.5063961	Bℓ
45	− 241.2	− 129.9	14.94	16.23	15021.349	0.5368966	
46	− 128.1	− 51.5	15.32	15.96	15021.264	0.6133669	
47	− 117.5	− 73.2	14.74	15.97	15021.459	0.5409923	Bℓ
48	+ 126.9	− 102.7	15.23	15.92	36669.346	0.6278128	
49	+ 140.0	− 100.7	14.71	16.11	36715.388	0.5482196	Bℓ
50	+ 8.8	− 234.0	14.57	16.09	36669.560	0.5130879	Bℓ
51	+ 30.8	− 226.4	15.16	16.18	36702.392	0.5839818	

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 5272 (continued)							
52	− 76.8	+ 152.0	14.92	16.06	15021.485	0.5162250	BR
53	− 7.4	+ 122.8	14.68	15.93	15021.006	0.5048878	
54	− 32.6	+ 106.4	14.92	15.94	15021.193	0.5063150	
55	− 204.2	+ 324.4	14.88	16.31	30000.032	0.5298136	
56	− 141.1	+ 358.6	15.38	16.02	22760.623	0.3295986	
57	+ 155.2	− 0.2	14.84	16.23	15021.618	0.5122223	
58	− 86.2	+ 46.2	14.58	15.91	22760.621	0.5170617	
59	− 109.8	− 228.4	15.23	16.20	36699.425	0.5888053	
60	− 297.8	− 315.4	15.24	16.15	15021.389	0.7077228	
61	+ 190.2	+ 363.0	14.96	16.21	15021.076	0.5209312	BR
62	+ 90.2	+ 417.0	15.42	16.16	15021.331	0.6524077	
63	+ 37.2	+ 341.9	14.96	16.22	15021.094	0.5704164	BR
64	+ 114.8	+ 330.4	15.32	16.26	30000.382	0.6054590	
65	+ 125.4	+ 327.5	14.79	16.22	30000.332	0.6683394	
66	− 101.4	+ 121.4	15.20	15.93	15021.323	0.6201827	
67	− 131.4	+ 123.0	14.95	16.07	15021.411	0.5683609	BR
68	+ 21.9	+ 174.8	15.0	16.0		0.3559732	BR
69	+ 80.6	+ 141.0	15.15	16.05	36692.851:	0.5665878	
70	+ 37.6	+ 152.2	15.22	15.75	15021.315	0.486:	BR
71	+ 160.6	− 2.0	15.07	16.04	15021.168	0.5490517	
72	+ 445.5	− 2.2	14.80	16.30	15021.327	0.4560739	
73	+ 438.5	+ 62.2	15.0	16.0			
74	+ 88.2	+ 151.0	14.80	16.20	36668.389	0.4921441	
75	+ 49.0	+ 159.5	15.38	15.98	36668.411	0.3140790	
76	− 14.4	− 88.2	14.90	16.46	15021.293	0.5017544	
77	− 94.4	+ 27.8	14.63	16.07	15021.451	0.4593425	
78	+ 47.5	+ 66.4	14.92	15.70	15021.249	0.6119254	
79	+ 43.4	+ 349.4	14.72	16.31	15021.229	0.4833275	BR
80	+ 416.8	+ 284.6	14.80	16.17	15021.433	0.5384827	BR
81	+ 342.8	+ 351.1	14.86	16.30	30000.461	0.5291108	
82	− 102.6	− 601.8	14.96	16.31	36668.477	0.5245061	
83	− 441.6	+ 113.4	14.87	16.32	15021.046	0.5012408	
84	+ 64.0	+ 165.2	15.26	16.12	36666.463	0.5957289	
85	+ 306.2	+ 225.8	15.32	15.92	22760.517	0.3558189	
86	+ 513.0	− 114.2	15.42	16.06	15021.016	0.2926601	
87	+ 110.6	+ 60.2	15.13	15.68	22760.535	0.3574814	
88	− 35.0	− 70.2	15.08	15.67	24290.324	0.2985092	
89	+ 28.0	− 110.8	14.85	15.93	15021.507	0.5484779	
90	+ 97.2	− 188.2	14.92	16.25	36692.397	0.5170334	
91	− 14.3	− 550.0	14.95	16.26	36669.366	0.5301630	
92	− 29.0	− 408.4	14.94	16.30	15021.083	0.5035553	
93	− 319.4	− 396.6	15.24	16.27	30000.420	0.6023007	
94	− 488.4	− 224.6	14.90	16.33	30000.304	0.5236936	
95	− 154.7	+ 15.4	13.73	14.42		103.19	
96	164.2	234.0	14.74	16.10	36692.470	0.4994467	
97	− 130.0	− 196.7	15.53	16.04	? 61.581	0.3349289	
98	+ 132.4	− 3.2	not var				
99	+ 201.8	− 55.0	14.8	15.8			

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 5272 (continued)							
100	+ 69.9	+ 97.3	15.31	15.96		0.6188126	
101	+ 46.4	+ 83.7	15.29	15.78	15021.101	0.6438975	
102	+ 58.4	+ 114.9	15.2	15.9	var?		
103	+ 58.1	+ 120.4	not var				
104	− 25.8	+ 145.5	14.73	15.99	15021.288	0.5699231	
105	− 20.9	+ 191.6	15.33	15.72	36668.548	0.2877427	
106	− 48.0	+ 168.0	15.18	16.04	36666.372	0.5471593	
107	− 75.8	+ 335.0	15.40	16.14	30000.039	0.3090348	
108	− 219.0	+ 310.9	14.94	16.30	30000.250	0.5196047	
109	− 89.3	+ 2.7	14.56	15.64	15021.033	0.5339239	
110	− 99.4	− 15.8	15.02	15.88	15021.397	0.5353569	
111	− 92.7	+ 21.9	15.06	16.02	15021.402	0.5102469	Bℓ
112	− 144.6	− 719.4	not var				
113	+ 199.8	− 689.8	14.90	16.25	15021.241	0.5130066	
114	+ 11.8	+ 622.0	15.18	16.24	15021.515	0.5977270	
115	+ 445.0	+ 664.7	14.98	16.34	15021.297	0.5133529	
116	− 491.8	+ 465.2	14.89	16.32	15021.441	0.5148088	
117	+ 89.6	− 467.6	15.22	16.22	15021.579	0.6005164	
118	+ 144.4	− 292.2	14.90	16.36	15021.272	0.4993807	
119	+ 253.4	+ 106.2	14.76	16.25	30000.192	0.5177411	
120	− 295.8	+ 231.4	15.56	16.07	15021.284	0.6401387	
121	− 43.6	+ 56.1	14.84	15.54	22760.550	0.5351882	
122	− 33.5	− 46.4	14.6	16.1		0.5017	
123	− 259	− 985	14.92	16.31	15021.395	0.5454472	
124	− 66.4	− 201.4	15.50	15.96	36685.349	0.7524328	
125	+ 186.3	− 132.8	15.48	16.00	36666.585	0.3498206	
126	− 15.4	− 146.4	15.42	15.96	15021.208	0.3484043	
127	+ 95.6	− 63.6	not var				
128	+ 114.6	+ 131.4	15.40	15.86		0.2922710	Bℓ
129	− 43.6	+ 77.2	15.2	16.1		0.305471	
130	+ 4.2	+ 84.6	15.27	16.00	22760.347	0.5688172	Bℓ
131	− 73.2	+ 27.4	15.04	15.56	15021.318	0.2976919	
132	− 53.6	− 22.0	15.3	16.4	24290.387	0.3398479	
133	− 58.6	+ 43.5	14.89	15.96	15021.482	0.5507230	
134	− 22.4	+ 52.4	14.9	16.3	24290.282	0.6190	
135	− 27.0	+ 38.0	15.0	16.5		0.56843	
136	− 25.4	+ 33.4	15.6	16.2			
137	+ 53.0	− 18.8	15.30	16.04	15021.155	0.5751464	
138	− 263.6	+ 41.9	14.0	14.46	35608.96	80.98	
139	+ 34.5	+ 28.0	15.25	16.12	22760.465	0.560004	
140	− 15.7	+ 108.9	15.07	15.51	22760.216	0.3331304	
141	−1497.5	− 249.9	14.98	15.97		0.2695671	RV CVn, EW, f
142	− 30	− 59	14.79	15.72	24290.397	0.5686256	
143	− 34	+ 16	15.4	16.4	24290.337	0.51111	
144	+ 54	− 100	15.27	15.99	24290.565	0.5967843	
145	+ 29	+ 8	14.9	16.5	24290.528	0.514456	
146	+ 96	− 59	14.6	16.5	24290.563	0.596740	
147	− 21	+ 46	15.1	16.3	24290.005	0.34644	

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 5272 (continued)							
148	− 7	+ 37	15.3	16.4	24290.170	0.467246	
149	+ 34	+ 52	14.7	16.5	24290.228	0.54985	
150	+ 69	+ 37	14.8	16.7	24290.359	0.52397	
151	+ 4	− 40	14.9	16.3	24290.191	0.51705	
152	+ 77	+ 50	15.42	15.76	24290.355	0.3261217	
153	− 38	+ 60	not var				
154	+ 2	− 29	12.1	13.7	38873.53	15.290	
155	− 64	− 74					
156	− 21	− 42	15.0	15.9	38872.331	0.531979	
157	− 17	+ 35	14.2	15.7	24647.650:	0.5283	
158	− 16	− 41	15.2	16.5	24647.564:	0.50809?	
159	− 15	+ 16	14.9	16.6	24647.602:	0.5337	
160	− 9	− 44	14.9	16.1	24647.446	0.64792	
161	+ 17	− 58	15.4	16.4	24647.567:	0.49874	
162	+ 28	− 32	not var				
163	− 16	− 32	not var				
164	+ 21	− 36	15.3	15.9			
165	+ 73	− 20	14.7	16.5	24647.544	0.483638	
166	− 97	− 8	15.4	16.1	38867.364	0.485622	
167	− 78	− 37	15.62	16.00	24647.448	0.6439839	
168	− 45	+ 7	14.9	16.0	24647.617	0.3770	
169	− 29	− 35	not var				
170	− 28	+ 32	15.1	16.1	24647.716:	0.43725	
171	− 27	+ 16	15.0	16.1	24647.864	0.4303	
172	− 21	+ 25	14.9	16.5	24647.700	0.59400	
173	− 13	+ 39	15.2	16.6	24647.670:	0.606990	
174	− 9	− 34	15.1	16.1	24647.710	0.4082	
175	+ 42	+ 26	14.9	16.2	24647.914	0.60780	
176	+ 46	+ 32	14.8	16.4	24647.621	0.55599	
177	+ 63	− 29	15.52	15.90	24647.953	0.3483438	
178	+ 79	+ 46	15.51	15.81	24647.755	0.2650805	
179	+ 39	− 774	not var				
180	− 19	− 27	not var				
181	− 30	− 14	not var				
182	− 19	+ 60	not var				
183	+ 29	+ 7	not var				
184	− 25	− 14	14.9	16.4	24647.841	0.517	
185	− 15	+ 32	15.2	16.1			
186	+ 12	− 64	15.1	16.1	24647.670	0.675	
187	− 23	+ 9	14.9	16.2	24647.961	0.3927	
188	− 27	+ 24	15.0	16.0	24647.615:	0.3677	
189	− 25	− 21	15.2	16.0	24647.964	0.668	
190	− 8	+ 28	14.8	16.5	24647.936	0.501	
191	0	+ 24	15.1	16.1	24647.981	0.512	
192	− 2	+ 3	15.0	16.1	24647.933:	0.525	
193	+ 15	− 7	14.8	16.3	24647.777	0.630	
194	+ 17	− 13	15.1	16.4	24647.758	0.549	
195	− 13	− 29	15.0	16.2	24647.470:	0.600	

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 5272 (continued)							
196	+ 47	+ 1					
197	+ 58	+ 10	15.1	16.5	24647.689	0.500075	
198	− 23	+ 15	15.2	16.0	24647.923:	0.3617	
199	− 19	+ 13	14.8	16.3	24647.699:	0.488	
200	− 4	+ 21					
201	+ 4	− 9	15.1	16.1	39964.391	0.541333	
202	− 379.7	+ 101	15.4	15.8		0.9987:	
203	− 30.2	− 308	15.56	15.72		0.28719	
204	− 106.4	− 18	15.76	15.90		0.9170:	
205	− 780	+ 720	15.4	16.2	35600.38	0.6369126	vZ 89
206	0	−1680	14.8	16.1	35601.41	0.5093832	vZ 1221
207	+ 36.0	− 30.8	14.8	15.4			vZ 991
208	+ 2.5	− 57.9	14.8	15.4			vZ 800
209	− 68.2	− 99.1	14.3	15.1			vZ 472
210	− 85.7	− 9.9	14.6	15.4			vZ 420
211	− 54.1	+ 6.6	14.6	15.7	41061.438	0.557798	vZ 519
212	− 21.6	− 38.0	15.2	16.2	38867.356	0.542196	SVS 1365
213	− 25.4	− 29.7	15.0	15.4			vZ 648?
214	+ 32.0	+ 5.8	14.6	15.6	41061.447	0.539493	vZ 971
215	− 13.9	− 0.9	14.8	15.6			vZ 717
216	+ 27.9	− 10.8	15.2	15.8			vZ 951
217	0.0	− 26.4	14.5	15.4			SVS 1370
218	+ 28.1	− 29.4	14.5	15.7	38867.304	0.543774	vZ 950
219	− 57.9	+ 15.7	14.6	15.8			vZ 509
220	+ 33.1	− 15.2	14.2	14.8			vZ 978
221	− 16.6	− 13.5	14.6	15.1			vZ 692
222	+ 96.3	− 63.3	14.9	15.9	38859.416	0.596764	vZ 1198
223	+ 23.9	− 5.8	14.8	15.4			vZ 930
224	− 22.1	+ 5.0	13.7	14.6			vZ 668
225	+ 8.8	+ 225	13.86	14.26	35651.38	89.59	vZ 837

Vars. 205. 206 found by Kurochkin, identified by Kukarkin; 207-224 by Kholopov; 225 by Russev. Variability of V8 and V156 reconfirmed by Kholopov, and of V138 by Russev. 11 suspected variables, Kholopov (1963). Identification of variables in this cluster is difficult. See von Zeipel numbers in S55a, with revisions by Kholopov (1963), and above for the new variables.

Arp, AJ 60.1 (1955); Roberts and Sandage, AJ 60.185 (1955); Osváth, Budapest Mitt 42 (1957); Kukarkin and Kukarkina, VS 12.291 (1958); Wallerstein, ApJ 127.583 (1958); Kurochkin, AC 205 (1959); Sandage, ApJ 129.596 (1959); Kraft, Camp and Hughes, ApJ 130.90 (1959); Kukarkin, AC 216.29 (1960); Kurochkin, VS 13.84 (1960); Thackeray, Obs 80.226 (1960); Kurochkin, VS 13.248 (1961); Kukarkina and Kukarkin, VS 13.309 (1961); Kurochkin, VS 14.196 (1962); Breckinridge, ASP 75.22 (1963); Kholopov, VS 14.275 (1963); Fernie, ApJ 141.1411 (1965); Feast, ApJ 142.796 (1965); Szeidl, Budapest Mitt 58 (1965); Kheylo, IBVS 171 (1966); Sturch, ApJ 143.774 (1966), AJ 72.321 (1967), ApJ 148.477 (1967); Kheylo, Problems in Astrophysics, Kiev, p. 62 (1968), NASA Tech Tr F598.57 (1971); van Albada, AAS Bull 1.366 (1969); Zhukov, Soviet Astr AJ 13.306 (1969); Kukarkin and Kukarkina, VS 17.157 (1970); Coutts, Bamb Veröff 9, 100.238 (1971); Kholopov, AC 640.3 (1971), AC 651.7 (1971), AC 652.7 (1971); Russev, VS 18.171 (1971); Kholopov, AC 676.7 (1972), Letter (1972); Szeidl, Letter (1972)

S55a, S57, S59, S61, A62, R62a, S62, P64, S64, L65, R65, St66, S67, C&S69, S69, S70, F72

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 5286 α 13^{h}43^m.0, δ −51°07′							
1	− 46.20	+145.48					
2	+ 78.10	− 42.63					
3	+256.58	− 39.60					
4	− 69.30	− 70.95					
5	+ 64.63	+ 27.78					
6	+ 60.23	− 33.00					
7	+ 24.48	− 60.23					
8	+ 16.50	− 35.75					

All above variables found by Fourcade and Laborde. One field variable, Bailey.

Bailey, HB 801 (1924); Fourcade and Laborde, Cordoba Repr 117 (1964), Cordoba Repr 126 (1965); Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966)

S55a, S59, R62c, S62, F&L63, S67, S69

NGC 5466 α 14^{h}03^m.2, δ +28°46′							
1	+858	− 95	15.80	16.80	40706.387	0.5774192	+
2	− 62	−110	15.77	16.77	40683.342	0.5885020	−, Bℓ
3	− 31	− 8	15.90	16.76	40704.319	0.5780638	cst
4	− 80	+ 9	15.69	17.03	40704.461	0.5120111	+, −, Bℓ
5	− 64	+112	15.85	17.10	39945.659	0.6152674	−
6	+122	− 24	15.60	16.60	40705.408	0.6206610	−
7	−210	−225	15.94	16.90	40702.398	0.7034205	cst
8	+ 23	− 6	15.81	16.70	40705.358	0.6291182	cst
9	+ 31	+ 15	15.74	16.77	39947.328	0.6850240	−
10	+ 85	+ 46	15.87	16.90	40705.468	0.7092735	cst
11	+117	+ 68	16.09	16.70	40705.285	0.3779938	cst
12	+ 17	− 88	16.09	16.66	39945.210	0.2942387	cst
13	− 49	− 73	16.10	16.80	40736.379	0.3415476	+
14	− 47	+ 52	15.86	16.70	39947.568	0.7858598	−
15	+223	+ 20	16.31	16.69	40705.223	0.4015471	−, +
16	−149	−175	16.04	16.74	39945.372	0.2966414	−
17	− 60	− 30	16.05	16.58	40706.394	0.3701037	+
18	+ 44	+ 41	16.0	16.7	30519.697	0.37406	
19	+157	−166	14.40	14.95	40705.737	0.8212879	Hop 216, f
20	−228	+ 45	16.42	16.72			Cuffey
21	+ 47	− 10	16.53	16.74			Cuffey
22	−153	− 80	16.08	16.65	40705.364	0.265687	Hop 35
23	+329	+ 15	16.50	16.73	40705.126	0.2321607	Hop 235, cst

Baade nos. 3, 4, 5 in corona considered probable members by Kukarkin and Kholopov. Cuffey 3-5-2-72 is considered field variable.

Kukarkin, VS 12.50 (1959); Cuffey, AJ 66.71 (1961), Letters (1961); Kurochkin, VS 13.248 (1961), VS 13.331 (1961); Kholopov, VS 14.71 (1962); Kurochkin, VS 14.196 (1962); Bartolini, Biolchini and Mannino, Bologna Pubbl 9, 4 (1965); Gryzunova, AC 526.8 (1969), VS Suppl 1.253 (1972)

S55a, S57, S59, S61, R62a, S62, S64, L65, R65, S67, C&S69, S69

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 5634 $\alpha\ 14^h27^m.0,\ \delta\ -05°45'$							
1	−56.5	− 19.5	16.41	17.39		0.65872	
2	−25.4	+ 83.1	16.19	17.38			
3	−45.1	+ 41.9	16.48	17.47			
4	+54.2	− 65.2	16.55	17.39			
5	−11.6	−162.9	16.72:	17.19			
6	+43.4	− 52.6	16.69	17.05:			
7	− 0.4	− 4.0					
Baade, Mt Wils Contr 706 (p) (1945) S55a, S59, S62, L65, S69							
NGC 5694 $\alpha\ 14^h36^m.7,\ \delta\ -26°19'$							
No variables found. Baade, ASP 46.52 (1934) S55a, S59, R62c, S62, S69							
IC 4499 $\alpha\ 14^h52^m.7,\ \delta\ -82°02'$							
1	+ 84.15	− 3.03					
2	+ 41.53	− 96.25					
3	− 90.75	−104.50					
4	− 33.55	− 14.03					
5	− 38.23	− 47.58					
6	− 2.75	+ 34.38					
7	+ 24.75	+203.50					
8	+ 88.00	+ 97.08					
9	+ 72.60	+105.60					
10	+ 11.00	+ 68.75					
11	+ 95.15	− 29.98					
12	+112.75	+ 62.15					
13	+ 44.28	− 17.33					
14	+ 22.83	19.25					
15	− 6.88	− 9.08					
16	− 66.00	+ 52.25					
17	− 22.00	+ 14.58					
18	− 62.15	− 22.28					
19	−159.50	− 21.73					
20	− 22.27	+159.23					
21	+ 85.53	+145.75					
22	+270.33	+ 64.35					
23	+ 93.50	38.50					
24	− 35.75	31.63					
25	−118.25	6.32					
26	−168.58	+159.50					
27	+ 19.53	+111.38					
28	− 11.55	− 44.28					

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
IC 4499 (continued)							
29	+ 41.25	− 13.75					
30	+ 85.25	− 33.55					
31	+ 35.75	+ 95.70					
32	+ 77.00	− 11.28					
33	+ 59.12	−273.35					
34	+ 88.00	−123.75					
35	+ 73.98	+101.75					
36	+159.78	+ 6.33					
37	+ 15.95	− 56.10					
38	− 85.25	+ 56.38					
39	+ 1.10	+ 39.05					
40	+128.98	+280.50					
41	+ 40.43	+178.75					
42	+115.50	− 22.83					
43	+ 64.90	−233.75					
44	− 62.98	+ 61.88					
45	+105.33	+250.53					
46	−133.10	−236.50					
47	+ 37.40	− 93.50					
48	+ 64.90	− 2.75					
49	+ 11.55	− 99.28					
50	+102.03	− 46.75					
51	+ 68.20	+ 9.90					
52	+ 63.53	+178.20					
53	+121.55	−110.00					
54	+ 93.78	−237.33					
55	− 46.75	− 31.08					
56	− 31.63	− 9.63					
57	− 6.05	+ 55.00					
58	− 58.30	− 67.65					
59	+ 71.23	− 42.08					
60	+ 2.75	+ 54.45					
61	+ 1.93	+ 57.48					
62	+258.23	− 88.23					
63	− 99.00	− 68.20					
64	+ 94.60	+ 57.20					
65	+ 30.25	− 93.50					
66	+132.00	+ 79.48					
67	+ 51.70	− 13.75					
68	− 25.03	+221.10					
69	−113.30	+ 19.25					
70	+ 66.28	− 18.15					
71	− 30.80	− 25.03					
72	− 8.25	− 69.03					
73	+234.58	−280.50					
74	+ 22.00	+ 66.28					
75	+ 16.50	− 63.25					

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
IC 4499 (continued)							
76	+333.30	+293.15					
77	+ 79.20	+ 52.25					
78	−187.00	+104.50					
79	−159.50	+316.25					
80	+ 33.00	−283.80					
81	+ 45.10	− 11.00					
82	+ 22.55	+ 8.25					
83	+ 19.53	+ 31.08					
84	− 24.48	− 41.53					
85	− 91.30	+309.93					
86	+ 69.85	+ 13.20					
87	+ 34.93	+ 73.98					
88	+ 85.25	+ 50.60					
89	− 68.75	− 0.83					
90	+ 3.30	− 19.25					
91	− 61.05	− 24.75					
92	+123.48	+138.05					
93	+ 35.75	− 32.18					
94	+ 15.50	+ 55.83					
95	− 37.40	+ 38.78					
96	− 8.53	+ 29.98					
97	− 45.93	− 88.28					
98	+251.08	− 44.55					
99	−292.05	+ 4.68					
100	+ 72.60	−266.20					
101	+ 35.75	− 20.35					
102	+ 36.03	+ 7.15					
103	+ 35.48	+ 52.25					
104	+ 63.80	+ 30.53					
105	+ 72.60	− 3.30					
106	+ 30.25	+133.93					
107	+159.23	− 81.68					
108	+121.28	+ 6.33					
109	− 96.53	+ 97.63					
110	+ 38.50	+ 82.23					
111	+ 49.50	−158.13					
112	− 30.25	+ 63.25					
113	+156.75	+226.88					
114	− 7.98	− 13.75					
115	+ 33.28	+119.08					
116	+ 30.25	− 31.90					
117	−242.28	+234.85					
118	+168.03	+181.50					
119	− 71.50	+ 13.50					
120	+ 85.53	−220.00					
121	− 96.25	− 31.63					
122	+ 11.00	− 20.63					

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
IC 4499 (continued)							
123	+164.45	+ 17.33					
124	+ 10.73	+197.73					
125	+130.35	+131.18					
126	+ 18.98	− 59.95					
127	+ 49.50	− 10.45					
128	+ 77.00	− 38.78					
129	− 13.20	− 39.60					

All variables found by Fourcade and Laborde, who also have suspected variables nos. 130-169 with coordinates, and no. 170.

Fourcade and Laborde, Cordoba Repr 126 (1965); Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966); Fourcade and Laborde, Cordoba Repr 173 (p) (1969)

S55b, R62b, F&L63, S67, S69, S70

NGC 5824 $\alpha\ 15^{h}00^{m}.9$, $\delta\ -32°53'$

1	− 72.8	+ 35.5	16.8	18.3	35638.20	0.597	
2	+ 11.3	+113.1	17.1	18.2	35635.48	0.651	
3	+124.7	+ 32.0	17.1	18.2	35636.42	0.641	
4	+186.5	+ 74.0	17.1	18.0			RRc?
5	− 9.5	+108.0	17.0	18.1	35638.21	0.634	
6	+ 98.6	− 34.2	17.2	18.1			RRc
7	− 36.9	− 71.6	17.4	18.0			RR
8	− 8.7	− 69.4	17.7	18.3			RR
9	+ 75.8	+ 72.2	16.9	18.3			RRa
10	+155.9	−113.0	17.3	18.0			RR
11	− 10.1	− 50.8	16.9	17.9			
12	− 73.3	− 40.0	17.0	18.2	35661.30	0.592	
13	+ 14.0	−106.1	17.4	18.0			RR
14	+ 19.0	+ 51.0	17.1	17.9		0.35?	RRc
15	+ 82.5	− 58.1	17.2	18.3			RR
16	+ 4.1	− 63.4	17.5	18.3			RR
17	+ 33.7	− 90.3	17.3	18.2			RRc
18	+132.9	− 3.6	17.1	18.2			RR
19	− 29.1	− 42.6	17.0	18.3	35636.22	0.635	RRa
20	− 82.1	− 19.8	17.5	18.1			
21	+ 45.2	+ 71.1	17.6	18.2			RR
22	+ 48.5	− 15.9	17.1	18.0		0.6	RRa
23	−125.6	−243.2	17.0	18.1	35630.23	0.618	
24	+ 96.3	−305.6	17.2	18.0			RRc
25	−333.4	+ 6.5	17.3	18.1			RR
26	+401.5	+362.9	17.0	18.1	35635.45	0.744?	RRa
27	+326.1	− 24.5	17.2	18.1			RR

All variables found by Rosino.

Rosino, ASP 73.309 (1961)

S55b, R57, S61, S62, S64, R65, FLA66, S69

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
Palomar 5 $\alpha\ 15^h13^m.5$, $\delta\ +00°05'$							
1	− 97	+ 25	17.50	17.92	33741.651	0.293230	
2	− 85	−246	17.61	18.01	34456.084	0.332467	
3	+143	−166	17.45	17.95	34182.801	0.329953	
4	+ 35	−238	17.45	17.93	34234.522	0.286362	
5	− 84	+ 94	17.55	17.85	34833.520	0.252395	
Pietra, Bologna Pubbl 6, 16 (1956); Mannino, Bologna Pubbl 6, 17 (1956); Kinman and Rosino, ASP 74.500 (1962); Rosino and Pinto, IAU Coll 21 (1973)							
S55a, R57, S59, R61, S62, S64, R65, S69							
NGC 5897 $\alpha\ 15^h14^m.5$, $\delta\ -20°50'$							
1	−109	−201	16.15	17.1	41100.695	0.4430685	
2	− 57	− 97	16.25	16.9	36752.627	0.454149	var
3	− 40	− 4	16.3	17.1	33481.615	0.419455	+
4	+ 71	+ 20	15.7	16.2	40807.611	0.42	
5	−136	+215	14.85	15.2	40807.611	64.5 irr	
6	+ 16	+ 59	16.4	16.9	41124.663	0.3325?	Alt 0.485
7	+ 20	+ 58	16.2	16.8	40803.536	0.511710	
Vars. 5-7 found by Sandage and Katem. Two suspected variables.							
Sandage and Katem, ApJ 153.569 (1968); Eggen, ApJ 172.639 (1972); Wehlau, Sawyer Hogg and Potts, JRASC 66.72 (1972), unpub (1972)							
S55a, S57, S59, S62, S69, S70							
NGC 5904 (Messier 5) $\alpha\ 15^h16^m.0$, $\delta\ +02°16'$							
1	+ 27.7	+161.1	14.66	15.69	13715.588	0.5217865	+
2	− 343.5	− 31.5	14.17	15.57	39256.416	0.5262679	Bℓ
3	+ 160.1	+113.7	14.62	15.47	36762.676	0.6001888	+
4	− 12.3	+ 73.8	14.65	15.89	27627.708	0.4496402	
5	− 7.8	+ 51.6	14.83	16.06	27567.929	0.545903	
6	+ 27.2	− 46.6	14.55	15.61	27567.856	0.5488311	−
7	− 5.1	−191.3	14.03	15.69	27601.730	0.494396	+
8	+ 134.0	−133.2	14.67	15.75	39942.309	0.5462306	+
9	+ 195.0	+ 88.0	14.57	15.50	27610.686	0.6988972	+
10	+ 107.4	+382.0	14.23	15.45	36762.591	0.5306602	−
11	− 154.5	+ 84.5	14.27	15.60	36762.605	0.5958939	+
12	− 175.5	− 17.3	14.20	15.78	27601.762	0.467716	−
13	+ 11.0	− 65.4	14.75	15.64	27567.800	0.5131223	+
14	− 145.6	+103.7	14.30	15.62	27610.358	0.4871724	−, Bℓ
15	+ 192.0	+ 3.6	14.70	15.28	27567.908	0.336763	+
16	+ 91.0	+ 83.9	14.29	15.53	27567.781	0.6476223	+
17	− 26.1	+ 44.3	14.80	15.91	27567.723	0.601354	
18	+ 151.7	−107.7	14.33	15.55	38911.175	0.464098	+
19	+ 233.7	−129.9	14.38	15.57	27601.706	0.469965	+
20	− 255.5	− 25.0	14.38	15.56	36762.787	0.6094778	+
21	+ 322.6	+ 74.0	14.38	15.38	13715.505	0.6048947	+
22	− 205.7	+383.5	not var				

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 5904 (continued)							
23	− 253.4	− 10.9	not var				
24	− 46.8	− 71.7	14.77	15.65	27567.821	0.4783771	
25	− 28.9	−128.0	13.83	14.73	27567.766	0.508	
26	+ 21.8	+101.5	14.42	15.46	27601.761	0.6225642	
27	− 6.7	− 59.2	14.37	15.74	27888.894	0.4703	
28	+ 132.2	−121.1	14.49	15.59	36762.271	0.5439272	−
29	− 374.7	− 76.6	14.42	15.53	27567.700	0.451433	−, Sp F
30	+ 22.8	−212.8	14.55	15.55	39942.454	0.5921739	−
31	+ 151.7	−141.7	14.77	15.48	13715.209	0.30058294	cst
32	+ 201.9	−150.6	14.10	15.67	13715.596	0.45778654	cst
33	− 21.1	+127.5	14.57	15.63	27610.270	0.5014750	+
34	+ 84.3	+ 59.5	14.65	15.52	27567.727	0.5681431	cst
35	− 12.2	−114.7	14.80	15.39	27610.406	0.3081255	+
36	− 8.4	− 52.2	14.96	15.91	27563.868	0.6277229	cst
37	+ 44.7	− 67.0	14.49	15.60	27605.762	0.4887941	
38	− 44.2	+117.2	14.49	15.90	27889.937	0.470441	
39	− 125.3	−205.2	14.08	15.63	27610.368	0.5890374	+
40	+ 124.8	+113.5	14.84	15.45	27610.461	0.3173299	+
41	+ 19.3	+231.4	14.19	15.57	27567.879	0.488572	−
42	− 123.2	−120.8	11.20	12.24	27567.8	25.738	Sp, V, mem
43	− 201.8	+154.3	14.70	15.43	27610.364	0.6602289	+
44	− 102.5	+ 31.1	14.97	15.61	27610.125	0.3296024	+
45	− 116.7	+ 65.7	14.74	15.90	27567.774	0.6166364	cst
46	− 80.0	+ 69.1	not var				
47	− 75.3	+ 58.1	14.84	15.96	27563.861	0.5397295	−
48	− 62.5	+106.3	not var				
49	+ 52.7	+177.5	not var				
50	+ 38.0	+109.1	14.00:	14.54:		irr?	Sp
51	+ 0.3	+135.5	var?				
52	+ 107.9	+ 35.3	14.49	15.57	27563.804	0.5017848	Bℓ
53	+ 68.9	+ 19.2	14.98	15.28	27601.70	0.37360	
54	+ 30.3	+ 57.2	14.62	15.68			
55	+ 80.1	−163.2	14.87	15.39	36762.219	0.3289013	+
56	− 68.9	+ 96.5	14.75	15.86	27889.931	0.5346903	
57	− 30.6	+ 99.7	14.94	15.43	27567.897	0.28467869	
58	− 605.1	+168.2	14.86	15.52	36762.274	0.4912489	+
59	− 150.0	− 35.5	14.70	15.67	13715.490	0.5420257	+
60	− 109.7	+ 8.2	15.04	15.74	27567.75	0.285218?	
61	− 254.9	− 31.4	14.42	15.62	27610.472	0.5686267	+
62	+ 166.8	−216.8	14.78	15.36	36762.543	0.2814154	+
63	+ 212.9	+ 51.8	14.10	15.50	13384.553	0.4976783	+, Bℓ
64	− 51.2	−248.9	14.43	15.55	27610.553	0.5445006	
65	− 159.9	− 93.8	14.07	15.02	36385.522	0.4806936	+
66	+ 218.3	+406.8	14.83	15.42	27610.242	0.3507086	+
67	−1028.2	− 59.8	14.36	15.13	13715.314	0.3490944	−
68	+ 897.5	+ 47.6	14.87	15.47	27610.347	0.3342667	
69	+ 653.3	+751.6	14.10	15.68	27610.320	0.4948729	−
70	+ 393.8	+626.4	14.54	15.70	27610.365	0.5585490	−

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 5904 (continued)							
71	+ 664.1	+290.3	14.25	15.86	27610.357	0.5024724	–
72	+ 689.7	+ 38.3	14.66	15.71	27610.318	0.5622722	–, Sp F
73	+ 17.3	+604.7	14.66	15.23	19533.289	0.3401261	+
74	+ 202.8	+162.8	14.83	15.18	36762.379	0.4539887	–
75	+ 78.6	−412.8	14.80	15.38	27610.523	0.6854171	+, Sp F
76	+ 80.5	−309.2	14.69	15.18	13524.125	0.3018963	–
77	− 171.5	−184.8	14.39	15.25	36762.596	0.845146	+
78	+ 65.5	+159.7	14.90	15.46	39942.389	0.26481739	cst
79	− 133.5	− 32.2	14.88	15.42	39942.316:	0.33313838	cst
80	− 48.6	+111.6	15.05	15.54	27562.986	0.3365424	–
81	− 72.2	−121.7	14.61	15.58	34131.439	0.5572965	–
82	− 67.8	+ 12.4	14.86	15.72	27563.798	0.5584455	
83	− 84.7	− 87.8	14.80	15.66	27567.783	0.5533073	cst
84	+ 43.7	− 31.9	11.54	12.61	27602	26.42 ±	Sp, V, mem
85	+ 38.3	− 34.4	14.80	15.70	27567.970	0.52741	
86	+ 34.6	− 33.0	14.50	15.83	27567.856	0.56733	
87	+ 122.0	− 1.8	15.00	15.38	21350.182	0.7383992	+
88	+ 65.2	+ 61.8	15.08	15.48	27563.832	0.32808270	
89	+ 60.0	+ 64.7	14.79	15.69	27626.707	0.55844189	
90	− 44.7	+ 15.3	14.67	15.88	27540.828	0.5571527	
91	− 36.0	+ 35.0	15.04	15.96	27567.927	0.584944	
92	− 56.6	−123.5	14.28	15.58	27567.963	0.4635789	
93	+ 44.0	− 35.7	14.54	15.81	27567.771	0.55231	
94	− 23.5	+ 17.4	15.26	16.11	27601.728	0.53141	
95	− 47.2	+102.8	15.13	15.80	27626.689	0.29082	
96	− 12.4	+ 32.9	14.96	16.15	27563.778	0.51225	
97	+ 48.9	− 92.5	14.18	15.61	27601.754	0.54466	
98	+ 37.3	+ 20.0	15.26	15.71	27605.737	0.3063857	–
99	+ 34.4	− 0.1	15.32	15.89	27567.739	0.32134	
100	+ 2.8	+ 48.7	15.30	16.01	27628.710	0.29434	
101	− 281.6	+ 36.0	17.15	22			UG?
102	+ 14.8	− 14.8					prob RR
103	+ 20.5	− 8.8					prob RR

Five suspected variables, Voroshilov (1971); one suspected, Osborn (1971).

Arp, AJ 60.1 (1955), AJ 62.129 (1957); Wallerstein, ApJ 127.583 (p) (1958), ApJ 129.356 (1959); Kraft, Camp and Hughes, ApJ 130.90 (1959); Preston, ApJ 134.651 (1961); Williams, AJ 71.615 (1966); Coutts, Doctoral Thesis, Toronto (1967); Sturch, ApJ 148.477 (1967); Wilkens, Inf Bull So Hemis 12.17 (1968); Coutts, Non-Periodic Phenomena in Variable Stars, ed. L. Detre, Budapest, p. 313 (1969); Coutts, Margoni and Stagni, AAS Bull 1.238 (1969); Coutts and Sawyer Hogg, Toronto Publ 3, 1 (1969); Kukarkin and Kukarkina, AC 541.1 (1969); Sturch, AJ 74.82 (1969); Zhukov, Soviet Astr AJ 13.306 (1969); Coutts Toronto Publ 3.81 (1971), IBVS 572 (1971); Kukarkin, AC 646 (1971); Kukarkin and Kukarkina, VS Suppl 1, 1 (1971); Osborn, IBVS 598 (1971); Voroshilov, AC 623.7 (1971); Coutts, Bamb Veröff 9, 100.238 (1972); Coutts and Sawyer Hogg, AAS Bull 4.217 (1972); Eggen, ApJ 172.639 (1972)

S55a, R57, S57, S59, S61, A62, R62a, S62, P64, S64, L65, R65, St66, S67, S69, S70, F72

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 5927 α 15^{h}24^m.4, δ −50°29′							
1	+141.90	+129.25					L&F 4, f?
2	− 45.38	0.0					L&F 14
3	− 4.6	− 4.1				300:	Osborn
4			14.6	15.3			V3, LE&M
5			14.7	15.2			V6, LE&M
6			14.7	15.3			V7, LE&M
7			14.7	15.3			V8, LE&M
8			15.0	15.6			V9, LE&M
9			15.1	16.0			V10, LE&M
10			14.7	15.1			L43, LE&M
11			14.7	15.1			L17, LE&M, f?

V mags. for vars. 4-11, Lloyd Evans and Menzies, unpub. (1972). 13 field variables, Laborde and Fourcade.

Laborde and Fourcade, Cordoba Repr 138 (p) (1966); Osborn, Obs 88.26 (p) (1968), Letter (1968); Lloyd Evans, Letter, V3 (1972); Lloyd Evans and Menzies, IAU Coll 21 (1973)

S55b, R62b, FLA66, S69, S70

NGC 5946 α 15^{h}31^m.8, δ −50°30′

1	+178.75	−118.25					F&L 1
2	− 56.37	− 19.25					F&L 2
3	+ 83.87	− 38.50					F&L 4

Five field variables, Fourcade and Laborde.

Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966)

S55b, R62b

NGC 5986 α 15^{h}42^m.8, δ −37°37′

1	+60.0	− 8.3	15.2	16.9			RR?
2	− 8.0	− 2.1	16.1	17.2			RR
3	+23.2	+110.5	16.0	17.0			RR
4	−82.5	+ 18.7	13.6	14.3			Slow
5	+58.6	− 2.8	16.1	17.1			RR

All variables found by Rosino.

Rosino, Asiago Contr 132 (p) (1962)

S55a, R57, S59, S61, R62c, S62, F&L63, S64, FLA66, S69

NGC 6093 (Messier 80) α 16^{h}14^m.1, δ −22°52′

1	−137	+ 49	13.1	14.6	32356.718	16.304	Sp F-G
2	+ 22	− 19	13.7	14.8	34889.704	24.9?	
3	+104	+ 56	15.5	16.15			Short P
4	− 85	+ 61	15.5	16.1			Short P
5	+ 14	− 67	15.4	16.3			Short P
6	+520	+296	12.1	16.1	32741.67	177.90	S Sco, f

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6093 (continued)							
7	+502	+112	11.9	16.3	32770.60	223.50	R Sco, f
Nova	+ 4.0	+ 2.7	6.8		00551		T Sco

Sawyer, Toronto Publ 1, 12 (1942); Joy, ApJ 110.105 (1949); Eggen, Royal Obs Bull 29.E73 (1961); Kukarkin, Letter (1972); Sawyer Hogg and Wehlau, unpub (1972)
Nova bibliography: Sawyer, Toronto Comm 1 (1938)
S55a, S57, R57, S59, S62, R65, St66, S67, S69, S70

NGC 6101 $\alpha\ 16^h20^m.0$, $\delta\ -72°06'$

Searched by Fourcade and Laborde, but no variables found.
Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966)
S55b, R62b

NGC 6121 (Messier 4) $\alpha\ 16^h20^m.6$, $\delta\ -26°24'$

1	− 281	+ 42	13.46	13.97	30000.08	0.2888545	0
2	− 248	−195	13.05	14.10	30000.03	0.5356832	0
3	− 208	−507	12.92	14.08	38500.16	0.506651	+
4	− 185	−340	11.0	12.5		50-70	Sp G, V
5	− 185	− 93	13.57	13.99	30000.05	0.622398	0
6	− 115	+318	13.54	14.09	30000.27	0.320516	0
7	− 113	+231	12.99	14.28	30000.13	0.4987743	0
8	− 110	+111	12.88	14.22	30000.18	0.508187	+
9	− 104	+105	12.75	14.16	30000.04	0.5718975	0
10	− 68	+159	12.68	14.18	30000.07	0.4907173	0
11	− 64	−297	13.32	14.14	33500.25	0.4930721	−
12	− 53	−207	13.04	14.38	33000.40	0.4461239	−
13	− 47	+270	12.37	13.08		40:	Sp G-K, V
14	− 47	−244	12.96	14.40	32500.35	0.4635338	+
15	− 32	+436	12.98	14.25	27500.35	0.4437857	−
16	− 29	+ 69	13.05	14.18	30000.02	0.5425421	0
17	− 8	+ 20	13.40	13.74			
18	+ 4	+ 27	12.84	14.20	30000.14	0.4787924	0
19	+ 11	+358	12.76	14.18	30000.41	0.4678111	0
20	+ 13	− 63	13.24	13.60	30000.27	0.309383	0
21	+ 19	− 4	12.73	14.10	29500.11	0.4719831	+
22	+ 34	+ 80	13.40	13.98	31000.43	0.6029436	+
23	+ 38	− 26	13.26	13.77	30000.02	0.2985502	+
24	+ 49	+ 48	13.12	14.06	31500.53	0.5467797	+
25	+ 70	+ 70	13.08	14.08	30000.25	0.6127346	
26	+ 94	− 72	12.80	14.14	35000.45	0.5412163	−
27	+ 118	+255	12.90	14.09	30000.52	0.6120191	0
28	+ 259	+ 84	12.60	14.02	31000.05	0.5223405	−
29	+ 326	+598	12.88	14.02	34000.19	0.5224824	−
30	+ 340	− 69	13.29	13.87	31000.12	0.2697490	−
31	+ 353	+ 45	12.72	14.03	31000.18	0.5053039	−

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6121 (continued)							
32	+ 746	− 40	12.98	13.96	30000.21	0.5791092	0
33	+ 805	+630	12.70	13.96	30000.39	0.6148303	0
34	− 820	+416	13.16	14.36	29723.338	0.554843	
35	− 377	+ 62	13.44	14.15	29705.441	0.627042	
36	− 208	−259	13.26	14.18	29676.370	0.541310	
37	− 39	+ 2	13.46	13.76	29522.064	0.247352	
38	− 23	+ 49	13.38	14.09	29496.053	0.577848	
39	+ 1	− 80	13.62	14.06	29676.463	0.623980	
40	+ 25	+ 49				0.40151	
41	+ 65	−150	13.53	13.97	29676.402	0.2517311	
42	+ 377	+558	13.33	13.78	29526.164	0.303708	
43	+1263	+332	12.92	13.48	29748.245	0.320637	

Joy, ApJ 110.105 (1949); Hoffmeister, Sonn Veröff 6, 1 (1963); Wilkens, La Plata Bol 7.14 (1964), MVS 2.101 (1964); Oosterhoff and Walraven, BAN 18.387 (1966); Ponsen and Oosterhoff, BAN Suppl 1.3 (1966); Eggen, ApJ 172.639 (1972)
S55a, S57, S59, S61, R62a, S62, S64, L65, R65, S67, C&S69, S69, S70

NGC 6139 $\alpha\ 16^h24^m.3$, $\delta\ -38°44'$

Observed by Fourcade and Laborde. No variables found.
Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966)
S55b, R62b

NGC 6144 $\alpha\ 16^h24^m.2$, $\delta\ -25°56'$

1	+481	−117	15.3	16.3

Sawyer, JRASC 47.229 (1953)
S55a, S57, S59, S62, S69

NGC 6171 (Messier 107) $\alpha\ 16^h29^m.7$, $\delta\ -12°57'$

1	− 112.8	−522.0	14.0	17.0	40504.	332	V720 Oph, V, f
2	+ 148.8	−388.8	15.6	16.4	40389.502	0.5710205	
3	− 224.4	−183.6	15.55	16.25	40389.595	0.566343	
4	− 99.6	−156.6	15.5	16.15	40389.628	0.2821317	
5	+ 231.0	−161.4	15.7	16.25	40389.709	0.70238	+
6	− 10.8	− 67.2	15.7	16.25	40389.740	0.2602558	
7	+ 42.0	− 61.2	15.6	16.55	40389.696	0.499728	+
8	+ 12.0	− 42.0	15.4	16.45	40389.957	0.559921	−
9	− 26.4	− 19.8	15.95	16.35	40389.583	0.3206025	+ ?
10	− 57.0	+ 8.4	15.4	16.6	40389.532	0.4155329	+
11	+ 9.6	+ 33.0	15.8	16.45	40389.611	0.592835	?
12	+ 58.8	+ 61.2	15.25	16.5	40389.593	0.4729722	−
13	− 27.0	+ 72.0	15.35	16.6	40389.596	0.466797	
14	+ 17.4	+ 82.2	15.4	16.5	40389.763	0.4816129	+
15	+ 19.2	+120.0	15.6	16.25	40389.687	0.2885895	

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6171 (continued)							
16	− 67.2	+113.4	15.65	16.5	40389.853	0.5228709	–
17	− 99.0	+ 71.4	15.4	16.45	40389.761	0.561154	
18	+ 77.4	+215.4	15.75	16.5	40389.898	0.564378	
19	+ 232.8	+162.6	15.75	16.3	40389.822?	0.2787622	
20	+ 31.2	+ 51.0	15.65	16.4	40389.653	0.578113	
21	+ 81.0	−144.6	16.3	16.6	40389.704	0.258125	
22	−1354.2	−183.0					prob f
23	− 263.4	+ 19.2	15.5	16.2	40389.725	0.3233436	
24	0.0	+ 8.4	15.65	16.45	40389.615	0.3462153	
25			14.8			red	SK217, L&M

Kukarkin, AC 216.17 (1960); van Agt, BAN 508.327 (1961); Kukarkin, VS 13.384 (1961); Mannino, Bologna Pubbl 7, 18 (1961); Kurochkin, VS 14.15 (1962); Kukarkin, VS 14.21 (1962); Coutts, Master's Thesis, Toronto (1964); Kurochkin, VS 15.164 (1964); Sandage and Katem, ApJ 139.1088 (1964); Sturch, ApJ 148.477, Abs. AJ 72.321 (1967); Dickens, ApJ Suppl 22.249 (1970); Coutts and Sawyer Hogg, Toronto Publ 3.61, Abs. AAS Bull 3.242 (1971); Dickens, Letter, VI (1972); Lloyd Evans, Letter, V25 (1972); Lloyd Evans and Menzies, IAU Coll 21 (1973)

S55a, S57, S59, S61, R62a, S62, S64, L65, R65, S67, S69, S70, F72

NGC 6205 (Messier 13) α $16^h39^m.9$, δ +36°33′

1	+ 73.06	− 24.86	13.6	15.1	39691.720	1.458997	Sp A-F, V, mem
2	− 54.10	− 3.04	12.8	14.3	39672.177	5.110939	+, Sp, V, mem
3	−127.70	+ 16.52	15.58	15.79	prob not var		
4	− 47.34	+ 58.18	15.04	15.23	prob not var		
5	+ 71.62	− 14.06	14.33	14.94	40046.7820	0.38177	
6	+ 92.68	+ 76.60	14.0	15.1	39664.923	2.112867	Sp F, V, mem
7	− 39.78	− 82.72	14.72	15.17			f
8	− 93.02	+ 11.29	14.2	15.6	39679.821	0.7503158	mem
9	+ 71.62	− 14.06	14.0	15.1	40038.8121	0.39265	
10	− 5.40	− 70.73	13.1	14.0		SR	Sp, V, mem
11	− 45.78	− 75.88	12.9	13.8		92.5	Sp, V, mem
12	−105.88	+ 53.46	15.0	15.35	prob not var		
13	− 45.37	− 31.30	14.26	14.50	prob not var		
14	+ 3.18	+207.64	16.16	16.45	prob not var		
15	+ 79.03	−115.34	13.32	13.67		irr	mem
16	+349.40	+207.90					Tsoo Yu-hua

Variable 16 = Savedoff A 18, probably Ludendorff 1113.
One field variable, Tsoo Yu-hua.

Joy, ApJ 110.105 (1949); Arp, AJ 60.1 (1955); Brown, ApJ 122.146 (1955); Savedoff, AJ 61.254 (1956); Wallerstein, ApJ 127.583 (1958); Kraft, Camp and Hughes, ApJ 130.90 (1959); Kurochkin, VS 13.248 (1961); Arp, La Plata Symp p. 87 (1962); Tsoo Yu-hua, Letter (p) (1964); Kadla, Pulk Mitt (Isw) 24.93 (1966); Osborn, Letter (1968), AJ 74.108 (1969), IBVS 350 (1969); Demers, AJ 76.445 (1971); Osborn, Letter (1972)

S55a, S57, S59, S61, R62a, S62, P64, S64, L65, R65, S67, S69, S70

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6218 (Messier 12) α 16^{h}44^m.6, δ −01°52′							
1	+34	−62	11.9	13.2	27306.708	15.508	Sp F-G, V
Sawyer, Toronto Publ 1, 2 (1938); Joy, ApJ 110.105 (1949) S55a, S57, S59, R62a, S62, R65, S69							
NGC 6229 α 16^{h}45^m.6, δ +47°37′							
1	− 24.6	−105.5	16.78	17.94	35630.542	0.5856908	
2	− 71.9	+ 4.9	16.95	17.93	35631.521	0.5552380	
3	−195.7	+ 41.3	17.21	17.82			
4	− 56.8	− 14.3	17.36:	17.89			
5	+ 14.5	+ 44.1	17.25	17.95	35633.555	0.5336051	
6	+ 44.1	+ 41.5	17.28:	17.96	27953.930	0.559385	
7	− 41.7	− 49.9	16.84	18.01	27978.840	0.506980	
8	− 4.1	− 42.1	15.47	16.51	35573.461	14.845093	Cep
9	− 38.9	+ 38.3	17.08	17.88	35629.516	0.5428497	
10	− 29.5	+ 72.7	17.20	18.00	35629.535	0.5547785	
11	+ 23.9	− 25.0	]17.44	18.01			
12	+ 34.2	− 23.6	17.12	18.02			
13	+140.2	+ 61.3	17.20	17.96	35630.552	0.5473432	
14	− 15.5	− 50.7	16.76	17.86	35631.565	0.4659161	
15	+ 34.2	+ 27.5	17.39	17.92	35611.460	0.2713783	
16	+ 47.0	− 24.2	17.31	17.94	35637.500	0.322784	
17	− 96.3	− 75.0	17.08	17.72	27979.830	0.324880	
18	− 36.1	+ 32.2	17.34	18.00			
19	+ 53.4	− 44.4	16.96	18.00	35629.546	0.4759609	
20	− 27.5	− 36.1	16.91	18.05	35631.524	0.4659728	
21	+117.3	− 61.6	17.12	17.94			
22	+ 4	− 7	15.2	16.3			prob slow
For variables with periods by both Mannino and Mayer, those of Mannino are tabulated because they are based on more observations. Baade, ApJ 102.17 (p) (1945); Sawyer, JRASC 47.229 (1953); Mannino, Bologna Pubbl 7, 13 (1960); Mayer, BAC 12.167 (1961) S55a, S57, S59, R62a, S62, S64, L65, R65, S69							
NGC 6235 α 16^{h}50^m.4, δ −22°06′							
1	−16	+ 39	16.5	17.2			
2	+58	−211	16.5	17.3			
Sawyer, JRASC 47.229 (p) (1953) S55a, S57, S59, S62, S69							
NGC 6254 (Messier 10) α 16^{h}54^m.5, δ −04°02′							
1	+ 5	+ 22	13.2	13.8			Sp G, V
2	+ 30	+120	11.91	13.34	34907.0	18.728	Sp F-G, V

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6254 (continued)							
3	−209	+106	13.10	13.82	34905.64	7.908	Min
4							Voroshilov
							Arp 1V-37

Joy, ApJ **110**.105 (1948); Arp, AJ **60**.1,320 (1955), AJ **62**.129 (1957); Wallerstein, ApJ **127**.583 (1958); Voroshilov, AC 623.7 (1971)
S55a, S57, S59, R62a, S62, R65, S69

Palomar 15 $\alpha\ 16^h57^m.6$, $\delta\ -00°28'$

No variables found.
Kinman and Rosino, ASP 74.499 (1962)
R61

NGC 6266 (Messier 62) $\alpha\ 16^h58^m.1$, $\delta\ -30°03'$

1	+ 41.0	+ 6.1					
2	− 26.6	− 68.9					Sp F-G
3	− 88.9	− 6.8			33421.41	0.49158	
4	− 93.9	− 39.3	15.68	16.85	33419.49	0.54113	
5	−163.2	+123.5	15.50	16.53	33417.51	0.46049	
6	− 81.7	+ 34.0			33419.30	0.49191	
7	+ 22.1	+169.4	15.86	17.06	33419.38	0.56389	
8	− 93.2	+162.4			33423.44	0.53200	
9	− 92.6	+213.1	15.40	16.68	33423.48	0.55662	
10	−454.0	+157.7	15.58	16.93	33418.45	0.53259	
11	−457.1	+126.7	16.06	16.85	33421.56	0.59823	
12	−204.4	+268.9			33421.39	0.48799	
13	+ 1.6	+ 30.2					
14	− 92.2	+265.8	15.27	16.83	33421.41	0.44216	
15	+123.0	+303.4	16.01	16.91	33423.60	0.63024	
16	− 74.5	+ 93.9	15.35	16.51	33421.55	0.59591	
17	− 22.1	+102.4			33423.51	0.5251	
18	− 33.3	+ 92.3	15.90	16.80	33423.58	0.52616	
19	− 14.5	+ 65.5			33421.53	0.52271	
20	+131.6	+159.4	15.68	17.00	33423.52	0.47201	
21	+105.9	+ 79.7	15.75	17.14	33421.42	0.45045	
22	+ 61.9	+ 11.9			33421.48	0.49925	
23	− 73.2	− 37.4			33417.56	0.44821	
24	+ 58.1	− 38.6			33417.59	0.52267	
25	+152.5	− 72.8	16.35	17.71	33421.45	0.44584	
26	−182.9	−303.1					
27	− 6.8	− 59.8			33423.40	0.44916	Vars. 27-42
28	+154.0	+ 19.3	16.81	17.45	33423.52	0.49749	discovered by
29	+153.4	+ 14.5	15.96	17.35	33423.44	0.56	van Agt
30	− 61.7	−181.9	16.69	17.36	33418.54	0.30440	
31	− 46.4	−143.0			33419.37	0.48500	
32	− 1.0	−136.4			33423.51	0.5468	

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6266 (continued)							
33	− 13.7	−117.9	16.79	17.71	33422.51	0.57438	
34	− 61.0	− 4.9			33422.54	0.58372	
35	−113.2	+ 14.1	15.56	16.82	33418.48	0.5288	
36	− 41.2	+125.6	15.84	16.66	33423.49	0.6530	
37	− 53.2	+ 6.5			33423.38	0.5852	
38	− 22.1	− 44.8			33421.56	0.77083	
39	−121.4	+ 59.0	16.02	16.89	33421.51	0.64020	
40	−122.0	+ 45.6			33423.52	0.30131	
41	−118.4	+ 40.7			33423.46	0.55848	
42	−130.0	+ 50.0	16.00	16.35	33421.56	0.24765	
43	− 62.8	−223.1	16.36	17.40	33423.37	0.56356	Vars. 43-82
44	− 47.6	−122.7	16.48	17.99	33423.54	0.44575	discovered by
45	+ 59.0	−187.7	16.72	17.95	33417.60	0.51688	Oosterhoff
46	+130.9	+477.9	16.65	17.63	33418.45	0.53874	
47	− 22.0	+241.6	16.34	16.93	33422.39	0.61211	
48	− 86.1	−130.8	16.35	17.29	33421.49	0.74360	
49	+139.0	−104.7			33423.35	0.54360	
50	+281.7	− 34.4	16.38	17.65	33421.56	0.50264	
51	+294.3	+193.7	16.40	17.01	33421.50	0.26181	
52	+ 75.9	−181.5	16.58	17.87	33423.59	0.50538	
53	−111.8	−101.0					
54	−150.5	−671.7			33423.51	0.38591	
55	+422.7	+278.4	16.07	17.11	33417.50	0.47872	
56	+ 37.1	+118.9	16.22	17.00	33423.47	0.5654	
57	+ 51.1	+121.1	16.00	17.03	33423.61	0.55636	
58	− 98.6	+ 32.2			33423.40	0.48100	
59	+122.1	+ 94.1	16.15	17.23	33421.46	0.57931	
60	+308.8	+395.5	15.99	16.53	33423.63	0.28662	
61	+215.9	+190.7	16.57	17.25	33421.48	0.26602	
62	+238.5	+104.9	15.99	17.26	33419.45	0.54807	
63	+105.4	−102.4	16.75	17.55	33418.59	0.64313	
64	−124.6	−266.4	16.10	17.08	33422.37	0.47299	
65	− 86.6	+137.5					
66	−316.8	+ 17.5	16.19	16.74	33423.60	0.33383	
67	+399.1	+621.4	16.12	17.14	33421.44	0.56488	
68	+146.5	+417.6	16.05	16.57	33419.50	0.23529	
69	+122.3	+109.9	16.39	16.94	33423.55	0.31369	
70	−725.2	− 86.9			33423.55	0.54546	
71	− 87.6	−482.4			33422.34	0.70452	
72	−182.7	−104.5	16.09	17.29	33421.43	0.46751	
73	−203.5	−105.5					
74	− 21.4	− 53.6			33423.60	0.46646	
75	+396.5	+237.5	16.57	17.10	33423.43	0.33429	
76	+178.1	+629.6	15.81	16.55	33421.50	0.61523	
77	+275.3	+ 33 1	16.82	17.30			
78	+338.4	+174.1	16.78	17.45	33421.49	0.62170	
79	+694.3	− 81.0			33423.40	0.31896	

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6266 (continued)							
80	− 85.3	+ 90.4	15.90	16.74	33422.54	0.58858	
81	−110.5	+ 97.3	15.65	16.95	33419.39	0.53093	
82	− 39.4	− 68.0			33421.58	0.56481	
83	− 38.3	− 9.9					van Agt
84			16.55	17.53			G&F
85			16.68	17.55			G&F
86			16.38	17.69			G&F
87			15.80	16.70			G&F
88			16.04	16.75			G&F
89			16.45	17.66			G&F

Wallerstein, ApJ 127.583 (1958); van Agt and Oosterhoff, Leiden Ann 21.253 (p) (1959); Gascoigne and Ford, Proc Astr Soc Aust 1.16 (1967); van Agt, Priv comm (1971); Gascoigne, Letter (1971)

S55a, S57, S59, S61, R62a, S62, R65, FLA66, S69, S70

NGC 6273 (Messier 19) $\alpha\ 16^h59^m.5$, $\delta\ -26°11'$

1	+ 4	+ 48	14.1	15.1	
2	+14	+123	13.4	14.7	Cep?
3	−28	− 6	14.2	15.2	
4	− 2	− 24	15.1	15.7	

Two field variables, Sawyer.

Sawyer, Toronto Publ 1, 14 (p) (1943)

S55a, S57, S59, S61, R62a, S62, S69

NGC 6284 $\alpha\ 17^h01^m.5$, $\delta\ -24°41'$

1	− 24	+ 36	15.6	16.1
2	− 47	− 17	16.1	17.0
3	− 28	− 13	15.3	15.7
4	+ 22	− 18	15.4	16.3
5	+109	−205	16.4	17.0
6	+139	+221	15.9	16.4

Four field variables, Sawyer.

Sawyer, Toronto Publ 1, 14 (p) (1943)

S55a, S59, S62, S69

NGC 6287 $\alpha\ 17^h02^m.1$, $\delta\ -22°38'$

1	−152	−40	16.2	17.1
2	+ 46	−26	15.7	15.9
3	+ 26	+44	16.1	16.8

Three field variables, Sawyer.

Sawyer, Toronto Publ 1, 14 (p) (1943)

S55a, S59, S62, S69

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6293 α 17^{h}07^m.1, δ −26°30′							
1	+ 81.0	+49.5	15.9	16.6			
2	−135.6	+64.5	15.8	16.7			
3	+ 48.6	+18.6	15.5	15.8			
4	+ 92	−81	16.1	17.1			
5	+ 78	−83	15.7	16.5			
Three field variables, Sawyer.							
Shapley, Mt Wils Contr 190 (1920); Sawyer, Toronto Publ 1, 14 (p) (1943)							
S55a, S59, S62, S69							
NGC 6304 α 17^{h}11^m.4, δ −29°24′							
1	+102.0	−114.4	16.5	18.0			
2	−168.9	+169.6	15.7	17.5			RR?
3	+200.5	+ 60.2	16.5	17.5			RR
4	−272.4	−154.9	16.0	16.9			
5	+235.5	− 7.8	16.7	17.6			RR
6	+304.7	−191.7	16.6	17.8			RR
7	+ 0.8	−293.5	17.5	18.3			
8	+486.7	+ 49.9	16.7	17.7			RR
9	+587.1	+230.2	16.8	17.8			RR
10	−591.2	−247.6	16.2	17.9			RR
11	−244.8	−534.6	16.4	17.2			
12			13.95	14.30			Terzan 28
13			11.00	12.52			Terzan 29
14			10.75	13.25			Terzan 30
15			12.90	13.88			Terzan 32
16			13.70	13.80			Terzan 33
17			15.25	15.40			Terzan 40
18			13.60	[14.60			Terzan 43
19			13.38	13.78			Terzan 68
20			13.91	14.15			Terzan 69
21			13.87	14.40			Terzan 72
Vars. 1-11 found by Rosino, 12-21 by Terzan on red plates. Many field variables by Terzan.							
Rosino, Asiago Contr 132 (p) (1962); Terzan, Haute Prov Publ 9, 1 (1966), Haute Prov Publ 9, 24 (1968)							
S55b, R57, S61, R62c, S62, F&L63, S64, FLA66, S69, S70							
NGC 6316 α 17^{h}13^m.4, δ −28°05′							
S55b, R62b							
NGC 6325 α 17^{h}15^m.0, δ −23°42′							
S55b, R62b							

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6333 (Messier 9) α 17^{h}16^m.2, δ −18°28′							
1	+ 91	− 76	15.6	16.9	29427.886	0.585727	
2	+ 40	− 31	15.6	16.4	29436.854	0.628191	
3	+207	−210	15.7	16.85	32000.735	0.605397	
4	+ 23	− 35	15.8	16.95	30520.749	0.670076	
5	+ 34	− 7	16.0	16.8	29435.870	0.274708	
6	− 70	− 14	15.7	16.95	29435.870	0.607795	
7	−111	− 80	15.95	17.2	29434.860	0.628456	
8	− 73	− 99	16.05	16.9			
9	+334	−191	16.0	16.75	30933.704	0.322990	
10	+ 37	+ 26	16.2	16.9	30553.653	0.242322	
11	− 4	− 7	15.7	16.8			
12	−275	−136	15.85	16.95	29408.951	0.571784	
13	+259	+ 11	16.7	17.8	30554.694	0.47985	f

Sawyer, Toronto Publ 1, 24 (p) (1951)
S55a, S59, R62a, S62, L65, R65, S69

NGC 6341 (Messier 92) α 17^{h}15^m.6, δ +43°12′							
1	+127.5	+ 41.3	14.35	15.30	24410.198	0.7028015	
2	+ 91.2	+ 69.2	14.55	15.25	24409.347	0.6438829	Bℓ
3	+ 53.7	+252.7	14.20	15.35	24410.377	0.6375010	−, Sp
4	− 76.0	+ 58.0	14.45	15.20	24433.262	0.6289128	
5	+ 81.6	− 53.7	14.50	15.25	24428.315	0.6196963	Bℓ
6	+ 38.7	+ 43.3	14.53	15.40	27340.360	0.600001	
7	+ 1.6	− 50.5	14.45	15.70	37871.517	0.5149114	
8	+208.9	+208.0	14.50	15.20	24410.289	0.6732769	Sp, Bℓ
9	+ 18.0	− 48.1	14.80	15.60		0.61 var	
10	+ 83.0	+ 36.3	14.75	15.20	24410.454	0.3773182	
11	+ 71.2	− 67.1	14.80	15.20	24466.213	0.3084409	Bℓ
12	− 29.9	− 97.8	14.70	15.10	38905.364	0.409939	
13	+153.4	− 60.1					
14	−316.0	+245.7	14.45	14.85	39026.410	0.346178	EW, f
15	− 2	+ 77	14.05	14.55			RR

V15 in Second Catalogue is same as V12 (Kukarkin, Letter, 1972) so V16 renumbered 15. Nine field variables, Mnatsakanian and Sahakian.

Walker, AJ 60.197 (1955); Preston, ApJ 134.651 (1961); Kheylo, IBVS 43 (1964), IBVS 104 (1965), Voprosy Astrofiziki, Kiev, p.124 (1966), VS 16.213 (1967); Sturch, AJ 72.321, ApJ 148.477 (1967); Bartolini, Battistini and Nasi, Bologna Pubbl 9, 15 (1968); Mnatsakanian and Sahakian, AC 528.5 (1969); Eggen, ApJ 172.639 (1972); Kukarkin, AC 707.7 (c) (1972)

S55a, S57, S59, S61, R62a, S62, P64, S64, L65, R65, St66, S67, C&S69, S69, S70

NGC 6342 α 17^{h}18^m.2, δ −19°32′

S55b, R62b

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6352 α 17^{h}21^m.6, δ −48°26′							
1	+226.33	−158.13					F&L 1
2	+130.63	+ 58.30					F&L 4, f?
3	286.00	+139.91					F&L 8
4			12.7	13.4			HH 113

Fourcade and Laborde nos. 2, 3, 5, 6, 7, 9-12 considered field. V4 found by Lloyd Evans and Menzies (1973), who also have one field variable.

Fourcade and Laborde, Cordoba Repr 117 (1964), Cordoba Repr 126 (1965); Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966); Hartwick and Hesser, ApJ **175**.77 (1972); Lloyd Evans, Letter (1972); Lloyd Evans and Menzies, IAU Coll 21 (1973)

S55b, R62b, F&L63, S67, S69

NGC 6355 α 17^{h}20^m.9, δ −26°19′

S55b, R62b

NGC 6356 α 17^{h}20^m.7, δ −17°46′							
1	15	− 24	16.3	17.2			
2	+101	−110	16.8	17.1			
3	24	+ 45	16.0	[17.5			
4	+187	+ 47	15.9	[17.5	32328.	208:	
5	255	+152	15.7	[17.5			
6*	575	+114	15.6	[17.3			
7			15.4V	15.6V			SW 34
8			15.6V	16.0V			SW 72
9			15.3V	15.7V			SW 30
10			15.4V	15.7V			SW 46

*Formerly Sawyer F1, which Wilkens says should be included in the cluster. Vars. 7-10 discovered by Lloyd Evans and Menzies (unpub).

Sawyer, JRASC **47**.229 (p) (1953); Sandage and Wallerstein, ApJ **131**.598 (p) (1960); Lloyd Evans, Letter (1972); Sawyer Hogg, unpub (1972); Wilkens, Letter (1972); Lloyd Evans and Menzies, IAU Coll 21 (1973)

S55a, S57, S59, R62c, S62, P64, R65, S69, F72

NGC 6362 α 17^{h}26^m.6, δ 67°01′							
1	00	00					
2	26	100					
3	83	90					
4	79	88					
5	+ 81	15					
6	− 54	+174	14.9	15.3	36565.999	0.2628878	VII 15
7	+ 22	+104	13.7	14.5	36565.724	0.5215674	VII 6
8	263	+108	14.8	15.3	36566.080	0.3810811	VII 17
9	207	+138					

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6362 (continued)							
10	+186	+353	14.5	14.9	36566.024	0.3617240	VH 10
11	− 29	+ 48					
12	−246	−103	14.5	15.5	36565.817	0.5328711	VH 3
13	−234	−120	14.4	15.4	36565.811	0.5800254	VH 1
14	+369	+ 28	15.0	15.3	36565.865	0.2463744	VH 16
15	+ 49	00					
16	+ 16	−270	14.2	15.5	36565.939	0.5256730	VH 4
17	+201	− 68	14.9	15.3	36566.026	0.3149808	VH W1
18	+110	+ 72	14.2	15.2	36566.074	0.5128892	VH 13
19	+123	− 25					
20	+ 45	− 15					
21	+160	−108					
22	+182	−313	14.8	15.3	36566.058	0.3639867	VH 14
23	+ 30	− 23					
24	+ 71	− 36					
25	−356	−212	14.0	15.5	36566.150	0.4558950	VH 2
26	+ 22	− 38					
27	−193*	+384	14.7	15.4	36566.061	0.3860821	VH 9
28	+ 24	+ 37					
29	− 15	− 35					
30	− 89	+ 74	14.2	15.4	36566.162	0.6133787	VH 5
31	− 33	+ 80					
32	+ 40	+ 31					L&F
33	+316	+364	14.7	15.3	36566.028	0.4412499	VH 11

* Coordinate corrected.

Vars. 16-31 found by van Agt (1961) seven of them independently by Van Hoof. One field variable, 58′ from centre, Shapley.

Shapley, HB 777 (1922); van Agt, BAN 508.329 (1961); Van Hoof, Louv Publ **14**, 131 (1961); Rosino and Sawyer Hogg, IAU Trans **11B**.301 (1962); Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966); Laborde and Fourcade, Cordoba Repr 138 (1966); van Agt, Priv comm (1971)

S55a, S59, R62c, S62, F&L63, S64, L65, R65, S69

NGC 6366 $\alpha\ 17^{h}25^{m}.1$, $\delta\ -05°02'$

1	− 26	− 42	15.5	17.0
2	+305	−390	15.7	16.8

Sawyer, Toronto Publ **1**, 5 (p) (1940)

S55a, S59, S62, S69, S70

Haute Provence 1 $\alpha\ 17^{h}28^{m}.5$, $\delta\ -29°57'$

1	T248, 1964
2	T249, 1964
3	T361, 1965
4	T362, 1965

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
HP 1 (continued)							
5							T363, 1965
6							T364, 1965
7							T126, 1966
8							T130, 1966
9							T247, 1966
10							T251, 1966
11							T136, 1966
12							T137, 1966
13							T139, 1966
14							T142, 1966
15							T143, 1966

Identification of new variables only on prints, as indicated.

Cailliatte, Lyon Publ **5**, 33 (1962), Haute Prov Publ **7**, 2 (1964); Terzan, Haute Prov Publ 7, 3, 38 (p) (1964), Haute Prov Publ **8**, 11 (p), 12 (1965), Haute Prov Publ 8, 12 bis (p) (1966)

R62b, S67, S69

NGC 6380 $\alpha\ 17^h31^m.9$, $\delta\ -39°02'$

1	−14.85	+131.45	F&L

Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966)

S55b, R62b

NGC 6388 $\alpha\ 17^h32^m.6$, $\delta\ -44°43'$

1			V1, M
2			V2, M
3			V3
4			V4, M
5			V6
6			V7
7			V8
8			V10
9			V11

All variables found by Lloyd Evans and Menzies, identified on print.

Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966); Feast, Quart JRAS 13.191 (1972); Lloyd Evans and Menzies, IAU Coll 21 (c) (1973)

S55b, R62b, F72

Tonantzintla 2 $\alpha\ 17^h32^m.7$, $\delta\ -38°32'$

1	+71.78	+63.25	F&L
2	+80.85	+49.50	F&L

Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966)

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6397 $\alpha\ 17^h36^m.8$, $\delta\ -53°39'$							
1	+210.7	+448.4	12.73	17.53	13727.6	314.6	Sp, M, V, f
2	−279.0	−424.6	14.30	15.24		45 or 60?	prob f
3	−220.0	− 33.5	15.51	16.65	33119.320	0.330667	f

Bamberg var. 866 in environs.

Swope and Greenbaum, AJ 57.83 (1952); Woolley, Alexander, Mather and Epps, Royal Obs Bull 43 (1961); Feast, Obs 86.120 (1966); Strohmeier, Bauernfeind and Ott, Bamb Veröff 6.9 (1966); Swope, Letter (1969)

S55a, S57, S59, A62, S62, P64, S64, R65, FLA66, S67, S69

NGC 6401 $\alpha\ 17^h35^m.6$, $\delta\ -23°53'$							
1			14.8r	15.2r			T&R 41
2			15.9r	16.5r			T&R 157
3			15.2r	15.9r			T&R 164

Terzan and Rutily have more than a hundred field variables.

Terzan and Rutily, Astr and Ap 16.408 (p) (1972), IAU Coll 21 (1973)

S55b, R62b

NGC 6402 (Messier 14) $\alpha\ 17^h35^m.0$, $\delta\ -03°13'$							
1	+ 17	+ 47	14.65	16.1	38191.8	18.734	−, Sp G, V
2	−116	−119	15.8	17.0	38198.58	2.794708	Sp F, V
3	− 3	− 90	16.65	17.55	38199.823	0.522455	−
4	+169	+ 73	17.2	18.6	38199.23	0.651313	
5	−136	+ 90	17.1	18.7	38199.61	0.548796	
6	+ 34	− 77	15.8	16.4			
7	+ 62	− 97	15.4	16.5	38189.56	13.603	+, Sp F-G, V
8	+ 96	+ 35	17.8	18.6	38199.496	0.686071	
9	+151	− 39	17.0	18.4	38199.47	0.538831	
10	− 51	−205	17.1	18.5	38199.34	0.585914	
11	+196	−223	16.4	18.0	38199.59	0.604417	
12	+224	−177	17.1	18.6	38199.918	0.503952	
13	− 29	−118	17.0	18.6	38199.690	0.535215	+
14	+ 54	+ 1	17.2	18.1	38199.931	0.471857	
15	−135	+147	16.9	18.6	38199.51	0.557727	
16	− 79	− 36	16.8	18.2	38199.40	0.600617	
17	−228	+122	15.5	16.15	38204.72	12.085	+, Sp, V, f?
18	+ 61	− 22	16.9	18.15	38199.885	0.479065	−
19	−128	+ 2	17.0	18.6	38199.34	0.545671	
20	−145	+ 98	17.9	18.55	38198.734	0.263721	
21	+ 72	+125	16.3	17.4			
22	+ 70	+ 95	17.3	18.5	38199.23	0.655916	
23	+ 74	+281	17.1	18.5	38199.72	0.552342	
24	− 2	+ 75	17.0	18.7	38199.64	0.519901	
25	− 28	−312	17.65	18.4	38199.48	0.360707	
26	− 85	+ 27	16.5	17.5			
27	−421	+151	16.45	17.6	34936	308.0	f?

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6402 (continued)							
28	−465	+372	15.0	16.0			E, f?
29	− 68	−152	15.7	16.2			
30	+ 76	− 12	16.9	18.3	38199.72	0.534226	
31	− 41	+ 32	16.8	17.7	38199.383	0.619636	
32	+ 36	+147	17.0	18.1	38199.55	0.655975	
33	−138	+ 12	17.3	18.3	38199.59	0.479946	
34	− 70	+ 26	17.8	18.8	38199.854	0.606627	+
35	−112	− 49	16.2	17.4			
36	+204	−346	17.2	18.3	38199.33	0.677990	
37	+ 5	+ 18	17.65	18.9	38199.654	0.489060	
38	+ 11	− 17	16.0	17.0			
39	+ 46	− 2	16.1	17.6			
40	+253	+310	16.4	17.1			
41	− 13	− 3	16.0	17.1			
42	+ 36	+ 12	15.9	17.1			
43	+ 68	+ 23	17.0	18.2	38199.46	0.521747	
44	+ 20	+116	16.3	17.5			
45	− 90	+ 94	15.7	16.4			
46	+ 91	− 66	16.4	17.4			
47	− 89	+ 26	16.5	17.6			
48	− 4	+ 40	16.3	17.7			
49	− 98	− 19	16.0	16.9			
50	− 15	− 38	16.1	17.0			
51	+104	−305	17.6	18.15	38198.709	0.367606	
52	+ 82	+ 39	16.5	17.0			
53	+134	+129	16.4	17.3			
54	+121	+113	16.6	17.6			
55	+ 33	+106	16.5	17.5			
56	− 68	−184	16.4	17.4			
57	+134	−116	16.3	17.6			
58	−123	− 34	16.4	17.3			
59	− 32	+ 30	17.4	18.75	38199.561	0.555634	
60	+ 41	+ 54	16.2	17.7			
61	+ 12	− 43	16.6	17.7	38199.610	0.569824	
62	−232	−154	18.0	18.5	38235.444	0.638460	
63	+122	− 63	16.5	17.4			
64	− 51	−169	16.5	17.5			
65	−125	+ 13	16.4	17.2			
66	−133	+ 37	16.6	17.4			
67	+ 34	+ 14	16.1	17.5			
68	+ 10	− 19	17.1	18.7	38199.958	0.507217	
69	+140	+ 26	16.6	17.3			
70	+ 43	− 23	16.0	17.2			
71	−116	− 50	17.05	18.3	38199.602	0.525925	
72	+122	−119	16.5	17.5			
73	+ 05	+ 07	16.5	18.0		irr?	
74	+ 07	+ 91	16.5	17.2		irr?	
75	+ 35	− 12	16.7	18.5	38199.737	0.545281	

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6402 (continued)							
76	−105	+ 03	16.1	17.0	38199.466	1.89003	
77	−110	+ 55	17.55	18.10			
78	−137	− 5	17.50	18.50			
79	− 12	− 18	17.40	18.50			
80	− 35	−145	17.50	18.45			
81	− 38	−138	17.65	18.10			
82	− 79	−122	17.65	18.20			
83	− 65	− 34	17.70	18.50			
84	− 44	− 38	17.80	18.60			
85	− 21	+ 48	17.65	18.25			
86	+ 64	+ 22	17.85	18.75			
87	− 74	+ 11	17.60	18.60			
88	− 78	+ 10	17.55	18.55			
Nova	+ 30	+ 04	16		29071		Only on plates of 1938

Vars. 73-77 and Nova, Sawyer Hogg and Wehlau; 77-88, Wehlau and Potts.

Joy, ApJ **110**.105 (1949); Sawyer Hogg and Wehlau, AJ **69**.141, Toronto Comm 97 (p) (1964); Rep, Sky Tel **27**.147 (p) (1964); Sawyer Hogg and Wehlau, AJ **70**.678 (1965), Toronto Publ **2**, 17 (1966), Toronto Publ **2**, 19 (1968); Demers and Wehlau, AJ 76.916 (1971); Wehlau and Sawyer Hogg, unpub (1972); Wehlau and Potts, unpub (1972)

S55a, S57, S59, S61, R62a, S64, R65, S67, C&S69, S69, S70

Palomar 6 $\alpha\ 17^h40^m.6, \delta\ 26°12'$

28 variables found in environs by Terzan, who says none is a probable cluster member.

Terzan, Haute Prov Publ **9**, 1 (1966), Priv comm (1969)

S70

NGC 6426 $\alpha\ 17^h42^m.4, \delta\ +03°12'$

1	−170	+ 44	17.30	18.25	35638.528	0.61784	
2	−204	− 53	17.60	18.10	35638.475	0.35545	Alt P 0.262
3	− 94	− 33	17.10	17.50	35660.484	0.40385	
4	− 77	74	17.70	18.15	35640.468	0.42586	
5	68	− 22	17.25	18.15	35638.460	0.70906	
6	46	+ 52	17.30	18.25	35638.449	0.68197	
7	+ 10	4	17.4:	18.1:			RRa?
8	− 15	53	17.4:	18.2:			RRa?
9	39	85	17.55	18.05	35638.460	0.29009	
10	+ 46	+ 11	17.55	18.05	35638.430	0.36503	
11	+285	− 7	15.40	16.30	35638.506	0.46164	V979 Oph, f
12	+ 33	2	17.60	18.00	35640.550	0.23679	Alt P 0.191
13	+137	215	17.20	18.10	35634.437	0.65190	

Three field variables also.

Boyce and Hurahata [illegible] 109.19 (19[illegible]2) (HV 11037); Grubissich, Asiago Contr 94 (p) (1958)

S55a, S59, S61, S62, L65, R65, S69

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6440 $\alpha\ 17^h45^m.9,\ \delta\ -20°21'$							
S55b, R62b							
NGC 6441 $\alpha\ 17^h46^m.8,\ \delta\ -37°02'$							
1	+ 46.20	− 44.83					
2	+ 36.85	+ 23.93					
3	+350.63	− 90.75					
4	+ 58.85	−176					
5	+206.25	+225.50					
6	+ 30.53	+ 48.68					
7	− 38.50	+485.10					f?
8	−243.10	−444.68					f?
9	− 27.50	− 47.30					
10	+ 74.25	− 60.50					
All variables found by Fourcade and Laborde.							
Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966)							
S55b, R62b							
NGC 6453 $\alpha\ 17^h48^m.0,\ \delta\ -34°37'$							
Observed by Fourcade and Laborde. No variables found.							
Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966)							
S55b, R62b							
NGC 6496 $\alpha\ 17^h55^m.5,\ \delta\ -44°15'$							
Observed by Fourcade and Laborde. No variables found.							
Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966)							
S55b, R62b							
NGC 6517 $\alpha\ 17^h59^m.1,\ \delta\ -08°57'$							
S55b, R62c							
NGC 6522 $\alpha\ 18^h00^m.4,\ \delta\ -30°02'$							
1	−67.5	+34.4	17.08	17.74	32416.672	0.270	G222, mem
2	+ 0.5	+39.7	16.79	17.77	32740.861	0.47398	G133
3	+14.7	+37.2	17.24	17.74	32705.874	0.289	G44, mem
4	+25.6	+ 8.3	17.27	18.59	32387.747	0.563826	G170, mem?
5	+66.0	−42.6	17.41	18.19	32349.871	0.28684	G37, mem
6	+96.5	+30.5	17.77	18.23	32416.753	0.192392	G247, mem?
7	−51.5	+62.7	17.02	17.61		irr	G172, f
8	−20.2	+49.6	15.76	17.00	32290.987	1.747	G27, f
9	−19.5	−64.9	16.73	17.23	32740.786	0.299	G232, f?
10			17.70 mean			0.564	Clube 7, mem

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks

NGC 6522 (continued)

G numbers those assigned by Baade and Gaposchkin. Clube's var. 7 identified on Plate 2 (1965) where some other numbers do not correspond with text. Membership comments from Clube (1972).

Gaposchkin, VS 10.337 (p) (1955); Nassau, Spec Vat Ric 5.171 (1958); Woolley, Report of the Astronomer Royal (1964); Alexander, Obs 80.110 (1965); Clube, Royal Obs Bull 95.E383 (p) (1965); Terzan, Haute Prov Publ 8, 12 (p) (1965); Clube, Letter (1972); Kukarkin, Letter (1972)

S55a, S59, S61, R62a, S62, P64, L65, R65, FLA66, S67, S69, F72

NGC 6528 $\alpha\ 18^h01^m.6$, $\delta\ -30°04'$

A few variables from rich galactic field projected against this cluster, but Baade considered none of them a cluster member. S55a.

Gaposchkin, VS 10.337 (1955)

S59, S61, R62a, S62, FLA 66, S69

NGC 6535 $\alpha\ 18^h01^m.3$, $\delta\ -00°18'$

1	−197	+65	16.3	17.3			

Sawyer, JRASC 47.229 (p) (1953)

S55a, S57, S59, R62c, S62, S69

NGC 6539 $\alpha\ 18^h02^m.1$, $\delta\ -07°35'$

One unpublished variable, Baade. S55a.

S57, S59, R62c, S62, S69

NGC 6541 $\alpha\ 18^h04^m.4$, $\delta\ -43°44'$

1	−18.0	−126.0	12.5	[16		long	Alcaino 127, prob mem

Alcaino, Astr and Ap 13.399 (1971)

S55a, S57, S59, R62c, S62, F&L63, FLA66, S69

NGC 6544 $\alpha\ 18^h04^m.3$, $\delta\ -25°01'$

R62b

NGC 6553 $\alpha\ 18^h06^m.3$, $\delta\ -25°56'$

1	+186	+ 20				0.5642	
2	+ 75	−152				0.5818	prob f
3	− 23	− 38				0.4886	
4	+ 16	− 2				270:	M
5	− 71	− 12				]100	
6							LE&M A1
7							LE&M A2

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6553 (continued)							
8							LE&M 3
9							LE&M 6
10							LE&M 7
11							LE&M 13
12							LE&M 14
13							LE&M 24
14							LE&M 33
Nova	−131:	−281:	8	[12	30955		N Sgr 1943

Vars. 1-5 found by Thackeray, 6-14 and one suspected by Lloyd Evans and Menzies (1973). Shapley's two suspected variables are doubtful, Thackeray, Letter (1956).
Lloyd Evans and Menzies, IAU Coll 21 (p) (1973). Nova: Mayall, AJ 54.191 (1949)
S55a, R57, S59, R62a, S62, R65, St66, S69

NGC 6558 $\alpha\ 18^h07^m.0$, $\delta\ -31°47'$

1	− 24.9	− 3.2	16.1	17.5		RR	Rosino
2	− 15.6	+ 46.6	15.0	15.8			Rosino
3	+ 52.1	+ 32.2	16.2	17.5		RR	Rosino
4	− 55.5	− 24.2	16.6	17.7		RR	Rosino
5	− 48.1	+124.7	17.0	17.6		RR?	Rosino
6	− 23.3	− 50.2	16.8	17.5			Rosino
7	+113.5	+132.4	14.4	15.4			Rosino
8	− 2.2	−183.6	16.3	17.4		RR	Rosino
9	−339.2	− 36.6	16.3	17.8			Rosino

Fourteen variables in field, Rosino.
Rosino, Asiago Contr 52 (1954), Asiago Contr 132 (p) (1962)
S55b, S57, R57, S59, S61, R62c, S62, S64, FLA66, S69

IC 1276 $\alpha\ 18^h08^m.0$, $\delta\ -07°14'$

1	+ 86.9	+115.0	[20.2	22		SR?	SH
2	− 15.2	+ 23.7	18.9	20.0	37468.96	0.548	K&R
3	+ 74.2	− 51.4	17.8	22		SR?	K&R
4	+ 41.7	+136.1	18.8	19.5		SR?	K&R
5	−204.4	+230.3	18.8	19.6		SR?	K&R

Sawyer Hogg, JRASC 53.97 (p) (1959); Kinman and Rosino, ASP 74.501 (1962); Rosino and Sawyer Hogg, IAU Trans 11B.301 (1962)
S55b, S57, S62, S64, S69

NGC 6569 $\alpha\ 18^h10^m.4$, $\delta\ -31°50'$

1	− 95.1	+ 28.9	17.3	18.1			Rosino
2	− 91.9	+ 0.3	17.0	18.0		short	Rosino
3	+ 43.7	+ 12.4	16.6	17.5		slow	Rosino
4	+116.5	+202.1	15.3	17.3			Rosino
5	− 20.7	− 2.5	17.0	17.8			Rosino

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6569 (continued)							
Three field variables, Rosino.							
Rosino, Asiago Contr 132 (p) (1962)							
S55b, R57, S61, R62c, F&L63, S64, FLA66, S69							
NGC 6584 α 18^{h}14^m.6, δ −52°14′							
1	−82.5	−24.75					F&L
Nine field variables, Bailey.							
Bailey, HB 801 (1924); Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966)							
S55a, S59, R62c, S62, F&L63, S69							
NGC 6624 α 18^{h}20^m.5, δ −30°23′							
1	+167.75	+176.00					F&L 1
2	+114.13	+226.88					F&L 2
3	− 9.63	+ 49.50					F&L 11
4	− 39.88	− 20.63					F&L 14
Only four of the variables in FLA 66 are listed here. The other 29 are considered field stars.							
Laborde and Fourcade, Cordoba Repr 127 (p) (1966); Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966)							
S55b, R62b, S67, S69							
NGC 6626 (Messier 28) α 18^{h}21^m.5, δ −24°54′							
1	+174.0	+188.5	15.1	16.4			
2	− 47.3	+ 63.1	14.3	14.8			
3	− 32.9	+111.0	14.6	15.4			
4	− 34.5	+ 33.6	13.6	14.8	32759.765	12.937	Sp F-G
5	− 44.8	+ 16.4	14.8	15.6	36040.674	0.644360	
6	+ 34.1	+ 50.4	14.3	15.2			
7	+172.2	+102.7	15.9	17.0			
8	+227.3	−222.3	15.6	16.6	25474.346	0.56600	Hoff 63c
9	−158.6	−252.4	14.75	15.7	35696.652	1.965	Alt 0.6627
10	+ 96	− 79	13.5	14.6			
11	− 14	+ 35	15.0	16.3			
12	+148	− 49	15.0	16.1	35373.660	0.578254	
13	− 92	− 24	15.1	16.7	34893.807	0.504027	
14	−131	−100	15.6	16.1		0.330918	
15	−472	−186	15.8	17.0			
16	+432	−372	15.9	17.0	36067.656	0.5220278	
17			12.8	14.8	38620	92.8	RV, Hoff 63a
18			15.4	16.6	28022.400	0.5782670	+, Hoff 63b
Joy, ApJ 110.105 (1949); Sawyer, AJ 54.193 (1949); Hoffleit, AJ 70.307 (1965); Deery, AAVSO Abstr Oct. p. 3 (1968); Hoffleit, IBVS 312 (1968), IBVS 387 (1969), IBVS 660 (1972); Sawyer Hogg and Moorhead, unpub (1972)							
S55a, S57, S59, S62, S67, S69, S70							

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6637 (Messier 69) $\alpha\ 18^h28^m.1$, $\delta\ -32°23'$							
1	− 20	− 9	13.0	15.0			red, mem
2	−228.8	+201.3	15.9	17.3			RR, f
3	− 36.6	− 78.5	14.6	15.8			red, mem
4	− 17.5	− 90.7	14.3	17.2	28433	196	mem
5	+ 8	+ 7	13.0	14.5		195	mem
6							II 37, red
7							III 43, red
8							IV 11, red

Vars. 1, 2, 3, 5 found by Rosino. V5 is Rosino 10, V4 is Ponson V1894. Rosino considers his variables 5-9 as field stars. Wilkens (Letter) suggests they may be cluster members. Identifications of new vars. 6-8, Lloyd Evans and Menzies (1973) from Hartwick and Sandage (1968).

Ponson, Leiden Ann 20.431 (Star 69) (1957); Rosino, Asiago Contr 132 (p) (1962); Hartwick and Sandage, ApJ 153.715 (p) (1968); Catchpole, Feast and Menzies, Obs 90.63 (1970); Lloyd Evans and Menzies, Obs 91.35 (1971); Wilkens, Letter (1972); Lloyd Evans and Menzies, IAU Coll 21 (1973)

S55b, S57, R57, S61, R62c, F&L63, S64, R65, FLA66, S69, S70, F72

NGC 6638 $\alpha\ 18^h27^m.9$, $\delta\ -25°32'$

1							Terzan 9
2							Terzan 10
3							Terzan 11

Terzan's new variables identified on print. Six unpublished variables, Sawyer Hogg and Terzan (1972).

Terzan, Haute Prov Publ 9, 24 (p) (1968)

S55b, S57, R62b, S70

NGC 6642 $\alpha\ 18^h28^m.4$, $\delta\ -23°30'$

1			14.5	16.0			Hoff 145a, M
2			14.9	16.0			Hoff 145b

Two field variables, Hoffleit 137a and 137b.

Hoffleit, IBVS 660 (c) (1972)

S55b, R62b

NGC 6652 $\alpha\ 18^h32^m.5$, $\delta\ -33°02'$

Observed by Fourcade and Laborde, 1966; no variables found.

Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966)

S55b, R62b

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6656 (Messier 22) α 18^{h}33^m.3, δ −23°58′							
1	− 54.0	− 10.0	14.2	15.4	36070.678	0.615543	
2	+ 158.6	+ 69.2	13.45	14.25	37113.784	0.641717	
3	+ 214.7	+420.2	15.4	16.6	40063.702	0.515485	f
4	− 4.0	− 68.0	13.9	15.1	40058.727	0.716393	
5	− 178.2	− 33.8	12.5	13.4	40027.818	92.6	Sp G, V, mem
6	− 74.4	−100.0	13.65	14.5	35279.755	0.638548	
7	− 342.4	+411.2	13.65	15.0	35279.755	0.649520	
8	− 39.5	− 64.8	12.0	13.0		irr.	Sp G, V, mem
9	− 211.2	− 35.0	12.8	13.8	32740.781	87.71	Sp G, V, mem
10	− 39.0	−125.0	13.75	14.7	36069.643	0.646018	
11	− 14.4	+ 14.0	13.1	13.9	36073.656	1.69049	Sp, V, mem
12	+ 0.8	− 77.8	14.2	14.6	Prob. not var.		
13	+ 76.4	+158.9	13.9	14.85	35309.730	0.672523	
14	+ 250.8	+486.4	14.5	17.5	34983.6	199.7	Sp M, V, f
15	+ 115.3	− 83.2	14.25	14.75	35279.755	0.373248	
16	+ 185.0	− 17.8	14.25	14.85	35335.645	0.325348	
17	− 438.0	+126.0	15.3	16.7	35338.7	113.2	f?
18	− 86	+433	14.3	14.7	34927.766	0.324960	
19	− 33	+130	14.3	14.8	35313.669	0.384009	
20	− 120	−123	13.9	14.6	34927.766	0.430060	
21	+ 36	+ 88	14.0	14.5	34922.732	0.327530	
22	−1089	+213	14.1	15.8	34927.766	0.6245374	
23	− 5	− 14	13.9	14.65	35341.635	0.355195	+
24	− 26	+ 10	14.4	15.5			
25	+ 326	+375	14.35	14.85	32006.740	0.402367	+
26			15.6	17.6	36051.7	309.0	Hoff 8, 181a, f?
27			14.0	15.1	35280.720	0.342811	Hoff 10, 181b, f?
28			13.8	14.8	34920.7	424.5	Hoff 16, 173a, f?
29			14.5	15.3			Hoff 187b
30			12.8	13.4			Hoff 191
31			12.8	13.5			Hoff 185
32	− 631	−331	15.4	18.0	34932.7	233.35	Watt, f?
33	− 149	−794	14.4	17.0	35308.8	250.3	Watt, f?

Sawyer, Toronto Publ 1, 15 (p) (1944); Joy, ApJ 110.105 (1949); Hoffleit, AJ 69.301 (1964), Sky Tel 27.274 (1964), AJ 70.307 (1965), AJ 72.711 (1967); Eggen, ApJ 172.639 (1972); Hoffleit, IBVS 660 (c) (1972); Sawyer Hogg and Wehlau, unpub (1972)
S55a, S57, S59, R62a, S62, L65, R65, S67, S69, S70

NGC 6681 (Messier 70) α 18^{h}40^m.0, δ −32°21′							
1	+ 46.1	−113.0	16.2	17.2		RR?	Rosino 1
2	−104.5	−581.3	16.1	17.1		RR?	Rosino 3

Four field variables, Rosino (1962).
Rosino, Asiago Contr 132 (p) (1962)
S55b, S61, R62c, F&L63, S64, FLA66, S69

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6712 $\alpha\,18^h50^m.3$, $\delta\,-08°47'$							
1	− 63	− 17	16.18	17.32	35284.988	0.512030	
2	+ 69	+ 15	14.70	16.00	35007.4	104.6	AP Sct, mem
3	− 28	− 93	16.66	17.34	35285.235	0.655680	
4	+179	− 27	16.96	17.62	35285.082	0.611741	
5	+ 67	− 71	16.00	17.40	35285.350	0.545390	
6	+ 18	− 41	16.10	17.62	35285.344	0.510849	
7	−129	− 18	13.10	18.20	35327	190.48	CH Sct, V, mem
8	+ 24	+ 60	14.55	16.20	35400	117.0	
9	− 4	+285	16.80	19:			UG?, f
10	− 99	+ 30	15.45	15.95	35287	174	
11	−116	−333	16.7	17.5			E, f
12	+ 29	+ 39	16.00	17.54	35285.298	0.502776	
13	− 93	+ 25	15.98	17.36	35285.193	0.562651	Ros, San
14	−426	+ 31	15.30	17.90	35690.5	202.2	Sawyer F1
15	+247	− 38	15.60	16.60		100?	Har 160
16	−138	+175	16.8	17.5			Har 141, E
17	+ 27	+ 49	15.5				Har 151
18	− 25	− 1	16.64	17.26	35285.123	0.345044	Sandage
19	− 13	+ 34	16.50	16.92	35285.162	0.423900	Sandage
20	+ 1	+ 9	16.60	17.14	35285.031	0.330870	Sandage
21			13.5	13.8			LE&M

Sawyer, JRASC 47.229 (1953); Harwood, Priv comm (1956), Leiden Ann 21.387 (1962); Smith, Sandage, Lynden-Bell and Norton, AJ 68.293 (1963); Rosino, Bamb KI Veröff 4, 40.202 (1965); Sandage, Smith and Norton, ApJ 144.894 (1966); Rosino, ApJ 144.903 (1966); Feast, Obs 87.35 (1967); Lloyd Evans, Letter (1972); Lloyd Evans and Menzies, IAU Coll 21 (1973)
S55a, S57, S59, S61, R62a, S62, S64, R65, S67, S69, F72

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6715 (Messier 54) $\alpha\,18^h52^m.0$, $\delta\,-30°32'$							
1	+ 83	+ 10	15.8	16.9	35661.45	1.34956	Cep
2	− 6	+ 90	16.3	17.3	35635.60	0.5111	
3	− 14	+ 179	16.5	17.6	35630.44	0.5010	
4	− 38	+ 311	16.6	17.8	35630.40	0.4803	
5	− 129	+ 45	16.5	17.8	35636.34	0.5780	
6	+ 194	− 188	16.6	17.8	35630.50	0.5417	
7	+ 54	− 165	16.6	17.5		0.46?	RR
8	+ 365	− 330	15.7	16.7			E? f?
9	− 67	− 637	16.8	17.7			RR
10	+ 115	− 530	16.9	17.6			RR?
11	− 106	−1086					f
12	− 220	− 248	15.4	16.4	35630.64	0.3220	prob f
13	− 238	+ 451	16.5	17.5			RR
14	+ 240	+ 213	16.2	17.4	35630.44	0.6892	
15	+ 124	− 63	16.6	17.5	35639.64	0.5869	
16	+ 87	− 917					f
17	+ 697	− 435	16.6	17.6	35665.30	0.4660?	

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6715 (continued)							
18	+ 511	+ 382	16.5	17.2			RR?
19	−1260	− 190					f
20	+ 106	+ 95	16.8	17.2			
21	+ 85	− 231		17.8	var?		
22	− 21	− 167	16.4	16.7			
23	+ 362	+ 170	16.8	17.6	35638.60	0.5286	
24	+ 453	+ 55	16.5:		var?		
25	− 65	+ 74	15.4	17.2	35628	101±	SR
26	+ 201	− 159	16.8	17.4			RR?
27	+ 209	− 306	16.75 med				
28	+ 68	+ 161	16.3	17.6	35630.45	0.5128	
29	− 134	− 43	16.6	17.7	35638.44	0.5893	
30	+ 2	+ 80	16.6	17.7			RR
31	− 104	− 66	16.8	17.7			RR
32	− 181	+ 69	16.5	17.7	35636.36	0.5210	
33	+ 72	− 112	16.3	17.5	35629.58	0.4922	
34	− 61	− 153	16.4	17.6	35636.32	0.5053	
35	− 83	+ 54	16.6	17.6	35665.36	0.5266	
36	+ 129	+ 51	16.5	17.6	35629.58	0.5977	
37	+ 41	− 44	17.3	17.9			
38	− 69	+ 37	17.1	17.8			
39	− 105	− 63	16.7	17.7			RRa
40	− 56	− 112	16.5	17.5	35630.44	0.586	
41	+ 128	+ 45	16.4	17.6	35630.45	0.6187	
42	+ 70	+ 57	16.8	17.8			RR
43	− 154	+ 54	16.8	17.5	35630.44	0.3913	
44	+ 10	− 81	16.6	17.8			RRa
45	+ 117	− 109	16.25	17.6	35630.62	0.4889	
46	− 38	− 39	17	17.8?			
47	− 29	+ 96	16.7	17.7	35635.60	0.5069	
48	+ 254	− 47	16.7	17.6	35635.58	0.6849	
49	− 101	− 134	16.8	17.4			RR
50	+ 104	+ 61	16.7	17.5	35630.64	0.5635	
51	+ 222	+ 208	16.85	17.55			RR?
52	+ 90	− 50	16.85	17.55			RR
53	− 66	− 76	16.8?	17.6			RR
54	− 113	+ 327	16.5	17.6	35629.57	0.5713	
55	+ 146	− 205	16.6	17.6	35629.58	0.4259	
56	− 336	− 124	16.65	17.4			RRc
57	+ 293	− 31	16.7	17.7		0.64?	RRa
58	+ 80	+ 282	16.5	17.5	35630.50	0.6148	
59	− 218	− 254	16.8	17.75	35630.63	0.5993	
60	− 269	− 247	16.8	17.6	35629.57	0.570?	RR
61	− 43	+ 107	17.05	17.85			RR
62	− 92	+ 102	17.0	17.8			RRc?
63	− 40	− 133	16.9	17.6			RR
64	+ 259	− 498	16.7	17.5			SR

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6715 (continued)							
65	+ 243	+ 165	16.25	17.05	35638.36	0.4481	f
66	+ 234	+ 207	15.6	17.1			SR
67	0	+ 69	16.85	17.55			RR
68	− 643	+ 337	16.8	17.7	35630.65	0.5414	
69	− 328	+ 283	16.45	17.25			RR?
70	+ 128	− 426	16.8	17.4			RR
71	− 32	+ 106	14.8	16.2		77:	SR
72	− 61	+ 149	15.6	16.7			E?
73	+ 26	+ 62	17.0	17.5			
74	+ 113	− 141	16.7	17.5			RR
75	+ 18	+ 79	16.5	17.7	35638.36	0.5797	
76	− 106	− 22	16.5?	17.5?			RR
77	− 112	− 42	16.5	17.5			RR
78	+ 73	− 13					
79	+ 30	− 46	16.9	17.5			RR?
80	+ 51	− 25	16.7?	17.5			
81	+ 45	+ 12					
82	− 49	− 46	16.7?	17.5?			

Vars. 29-82 found by Rosino and Nobili.
Rosino and Nobili, Asiago Contr 97 (p) (1959)
S55a, R57, S57, S59, S61, R62a, S62, L65, R65, FLA66, S69

NGC 6717 $\alpha\ 18^h52^m.1, \delta\ -22°47'$

S55b, S61

NGC 6723 $\alpha\ 18^h56^m.2, \delta\ -36°42'$

1	+ 75.1	−199.5	15.76	16.25	38993.793	0.538177
2	+135.7	− 78.3	14.71	16.47	38993.951	0.503539
3	−244.4	+ 7.5	14.78	16.57	38994.131	0.494097
4	+ 16.8	+ 77.4	14.55	15.90	38993.855	0.451060
5	− 4.7	+ 51.0	15.20	16.00		0.57264
6	+ 7.2	+ 48.3	14.90	16.05	23618.80	0.4814
7	+197.5	− 71.3	15.53	16.14	38994.037	0.307672
8	+ 15.9	+ 10.8	14.75	15.60		0.53
9	+ 74.0	+ 15.7	14.70	15.80	38994.101	0.575803
10	+148.6	+ 83.9	15.39	16.03	38993.996	0.252325
11	+133.3	+228.8	14.85	15.65	38993.922	0.534283
12	+ 43.2	− 45.7	14.95	15.85	23618.53	0.4694
13	− 46.2	− 71.3	14.69	16.22	38993.930	0.507867
14	+ 38.2	− 43.2	14.95	15.80	23618.91	0.6190
15	− 93.4	+167.5	14.72	16.43	38993.847	0.435439
16	− 46.5	+ 93.3	14.55	15.69	38994.104	0.696273
17	+ 43.1	−102.5	15.27	16.66	38994.135	0.530179
18	−137.8	− 18.2	15.40	16.27	38994.091	0.526455
19	−169.4	−112.5	15.24	16.63	38994.018	0.534111

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6723 (continued)							
20	+ 3.5	+ 39.9				0.49293	F&L
21	− 79.0	− 28.2	14.50	15.72	38993.760	0.594863	
22	− 70.8	+ 38.1	15.18	15.72	38994.19	0.30844	
23	+ 53.4	− 10.0			38994.08	0.6259	
24	+117.5	−112.0	15.50	16.11	38993.999	0.300143	
25	+ 98.6	+203.1	12.1V	13.0V		SR?	
26	−197.0	+155.9	12.2V	13.1V		SR?	
27	−219.1	+101.6	15.50	16.33	38994.093	0.619249	
28	+ 10.8	− 79.0				0.4863	
29	+ 12.4	+ 63.6				0.53:	

New coordinates for all variables, Menzies (1973), who discovered vars. 21-29.

Innes, UOC 37.300 (UY Cr A) (1917); Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966); Menzies, Proc Astr Soc Aust 1.16 (1967), Doctoral Thesis, Australian Nat'l Univ (1967); Lloyd Evans, Letter (1972); Lloyd Evans and Menzies, IAU Coll 21 (1973); Menzies, IAU Coll 21 (1973)

S55a, S59, S62, L65, R65, S69

NGC 6752 $\alpha\ 19^h06^m.4$, $\delta\ -60°04'$

1	+236.5	+143.0		F&L
2	+ 44.0	+ 82.5		F&L

V1 considered the same as that mentioned in S55a.

Fourcade, Laborde and Albarracin, Atlas y Catalogo, Cordoba (1966); Eggen, ApJ 172.639 (1972)

S55a, S57, S59, R62c, S62, F&L63, S69

NGC 6760 $\alpha\ 19^h08^m.6$, $\delta\ +00°57'$

1	+57	− 57	15.7	17.0
2	− 6	−100	16.7	17.2
3	+31	− 10	15.5	[17.4
4	+42	+ 39	15.4	[17.5

Taffara has new eclipsing variable in field, and gives periods for it and two other field eclipsers.

Sawyer Hogg, IAU Agenda and Draft Reports, p. 560 (1967); Taffara, SA1 43.481 (1972)

S55a, S57, S59, R62a, S62, S69

NGC 6779 (Messier 56) $\alpha\ 19^h14^m.6$, $\delta\ +30°05'$

1	+ 44.69	+ 74.10	15.0	16.2	30899.341	1.510019	Cep, Sp, V, mem
2	+ 18.16	+ 33.09	15.1	15.6		SR	
3	+ 25.10	+ 91.69	14.4	15.1		SR	Sp, V, mem
4	−112.13	−159.46	15.9	16.4			
5	+ 6.79	−134.78	14.4	15.2		SR	
6	− 2.02	+ 37.06	12.9	14.8	30172.7	90.02	RV, Sp, V, mem
7	+293.48	−213.24	15.6	16.3		irr	

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6779 (continued)							
8	− 97.63	−335.90	15.9	16.7		SR	
9	+177	+525	15.6	16.1		SR	
10	−431.53	+ 88.33	16.4	17.4	30967.473	0.5988948	RR, f?
11	−415.58	+283.80	15.5	16.3	34239.516	0.0756252	RRs, f?
12	−243.96	− 95.41	15.6	16.4			

Field variables found by Kurochkin, 20 (1968), 21 (1970), 30 (1971).
Joy, ApJ 110.105 (1949); Sawyer, JRASC 43.38 (1949); Balázs, Budapest Mitt 30 (1952); Rosino, Asiago Contr 117 (1961); Preston, Krzeminski and Smak, ApJ 137.401 (p) (1963); Barbon, Asiago Contr 175 (p) (1965); Kurochkin, VS 16.460 (c) (1968), VS 17.186 (c) (1970), VS 17.620 (c) (1971)
S55a, S57, S59, R62a, S62, S64, R65, S67, S69, S70

Palomar 10 α $19^h16^m.0$, δ +18°28′

V1 found by Rosino (1972) on red plates, centre of cluster, large amplitude.
Rosino, Letter (1972)
R61, S61

NGC 6809 (Messier 55) α $19^h36^m.9$, δ −31°03′

1	+304.2	− 55.6	32413.39	0.57997286
2	−214.9	− 26.0	32467.18	0.4061601
3	+ 78	−304	32413.22	0.6619023
4	+108	+ 59	32413.34	0.3841702
5	− 41	− 74		0.2?
6	+111	− 20	32413.32	0.388904

Bailey, HA 38.243 (p) (1902); King, HB 920 (1951)
S55a, S57, S59, S61, R62a, S62, R65, FLA66, S69

Palomar 11 α $19^h42^m.6$, δ −08°09′

No variables found. Abell suggests this may be very rich open cluster.
Kinman and Rosino, ASP 74.499 (1962)
R61, S61

NGC 6838 (Messier 71) α $19^h51^m.5$, δ +18°39′

1	+140	+ 24	13.5	14.9		193	Z Sge, SR
2	+ 44	−146	13.8	14.7			Slow
3	+ 44	− 70	15.2	17.0	33481.78	3.7907	E, Min, mem
4	+266	+ 31	14.7	15.3			RR?

Silbernagel, AN 192.450 (1912); Sawyer, JRASC 47.229 (1953); Prochazka, Letter (1967); Hartwick, Priv comm (1972); Kukarkin, Letter (1972); Sawyer, unpub (1972)
S55a, S57, S59, S61, R62a, S62, P64, R65, St66, S69

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6864 (Messier 75) α 20^{h}03^m.2, δ −22°04′							
1	+ 15.6	−83.4					
2	− 9.0	+54.0					
3	+ 18.0	+85.5					
4	− 18.0	−84.6					
5	+108.0	−36.0					
6	+ 8.4	−81.0					
7	− 24.6	+78 0					
8	− 13.5	−41.4					
9	+ 45.6	−24.0					
*10	− 43.5	+50.4					
11	+121.2	+84.0					
12	+ 39.6	+75.0					
NGC 6934 α 20^{h}31^m.7, δ +07°14′							
1	− 45	− 39	16.5	17.7	27307.968	0.568099	
2	− 40	− 14	16.4	17.9	27658.930	0.48195	+
3	0	+ 58	16.6	17.8	27275.882	0.539806	
4	+ 39	+ 58	16.3	17.8	27275.882	0.616422	
5	+ 59	+221	16.7	17.8	26923.943	0.564560	
6	− 27	− 33	16.7	18.0	27275.941	0.5558418	
7	+ 92	+ 59	16.65	17.7	28038.833	0.644049	
8	+100	+ 50	16.75	17.5	27715.760	0.623989	
9	+ 63	+ 18	16.5	17.8	27308.844	0.549156	
10	−135	+ 72	16.4	17.8	27275.882	0.519959	−
11	+ 17	+ 28	17.1	18.15			
12	+ 29	− 44	16.3	17.4	27309.955	0.464215	
13	− 47	+ 25	16.55	17.8	26915.956	0.551334	
14	− 7	− 90	16.5	17.8	27659.902	0.52199	
15	+ 10	− 53	15.65	16.3			not RR
16	+ 36	+ 18	16.7	17.9	26915.956	0.604853	
17	− 73	−107	16.7	17.9	27309.955	0.598272	
18	+ 49	− 8	16.6	17.7			RR
19	+ 30	+ 1	16.4	17.9	21515.710	0.480550	
20	− 26	+ 17	16.5	17.6	27307.886	0.548225	
21	− 35	− 3	16.6	18.15			RR
22	−240	−173	16.5	17.8			RR
23	− 31	− 16	16.85	18.05			RR
24	+ 37	− 53	16.8	17.95			RR
25	+ 50	+ 37	16.5	17.9	27275.795	0.509086	−
26	+ 31	−196	16.9	17.8			RR
27	−148	+180	16.7	17.8	27272.914	0.592204	
28	−234	+100	16.3	17.8	27715.760	0.485151	+

*Suspected. Four additional suspected variables, numbered 13-16, are omitted.
Shapley, Mt Wils Contr 190 (p) (1920)
S55a, S57, R57, S59, S61, S62, S64, S69, S70

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6934 (continued)							
29	− 85	−183	16.4	17.8	26628.689	0.454818	
30	+161	+127	16.6	17.65	27714.745	0.589853	
31	+146	−101	16.5	17.8	21481.825	0.505070	
32	− 10	+ 51	16.4	17.7	21481.825	0.511948	
33	+ 37	+ 12	16.5	17.7	27309.920	0.518445	
34	− 21	+ 16	16.6	18.05			RR
35	+157	−142	16.6	17.85	27664.870	0.544222	
36	+ 10	− 35	16.05	17.55			RR
37	+ 23	+ 10	16.5	17.95			RR
38	+ 12	− 18	16.6	18.0	21543.702	0.523562	
39	+ 8	− 16	16.6	17.95			
40	− 8	+ 26	16.15	16.8			RR
41	+ 30	− 39	16.6	17.9	27275.882	0.520404	
42	+ 55	+ 20	16.5	17.9	27659.975	0.524251	
43	+ 21	+ 27	16.4	17.4			
44	− 43	− 30	17.0	17.9	26925.933	0.630384	
45	− 32	− 9	16.3	17.8			
46	+ 14	− 24	16.9	18.05			
47	+ 10	− 26	16.8	17.95			RR
48	+ 33	+ 52	16.5	18.05			RR
49	+ 13	− 55	16.7	17.95			RR
50	+ 15	− 37	16.9	17.95			
51	+ 7	− 25	15.85	16.6			RR

Sawyer, Toronto Publ 7, 5 (p) (1938); Sawyer Hogg and Wehlau, unpub (1972); Harris, AJ 78, in press (1973)

S55a, S57, S59, S61, S62, S64, R65, S67, S69, S70

NGC 6981 (Messier 72) $\alpha\ 20^{h}50^{m}.7$, $\delta\ -12°44'$

1	+ 43.5	− 54.0	16.45	17.25	33129.400	0.619818	
2	+ 99.0	+194.4	16.29	17.95	33126.405	0.46526213	−
3	− 52.5	− 58.5	16.16	17.74	33809.553	0.4976052	−
4	−106.5	+ 37.5	16.56	17.74	33147.462	0.5524863	−
5	− 38.4	− 21.6	16.40	17.43	22163.738	0.4991	
6	+ 78.0	+ 78.6	16.70	17.10			
7	− 3.6	+ 55.5	16.36	17.53	39318.997	0.524630	
8	− 6.6	+ 89.4	16.73	17.74	33145.372	0.5683752	−
9	+ 11.4	+ 50.4	16.73	17.54	39319.660	0.60296	
10	− 48.6	− 73.5	16.69	17.77	33857.504	0.5581814	+
11	+ 57.0	− 36.6	16.81	17.72	39319.478	0.51997	
12	+ 9.0	− 21.6	16.31	17.17	22163.90	0.4111	
13	+ 13.5	+ 17.4	15.77	16.85	39319.330	0.55114	f?
14	− 13.5	+ 36.0	16.40	17.06	22163.90	0.5904	
15	− 64.5	− 21.0	16.63	17.56	39318.917	0.55044	
16	− 4.5	− 19.5	16.31	17.21	39319.490	0.585497	
17	+ 3.6	− 43.5	16.57	17.62	33215.483	0.5735404	+
18	− 26.4	− 37.5	15.70	16.28	22162.88	0.52016	

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 6981 (continued)							
19	+ 3.0	+112.5	17.15	17.30	not var		
20	− 54.6	+ 15.0	16.50	17.40	33857.420	0.595046	
21	− 82.5	+ 12.6	16.56	17.86	33145.370	0.5311636	+
22	−113.4	+ 1.5	17.10	17.25	not var		
23	− 99.0	+116.4	16.95	17.73	39319.437	0.585083	irr
24	− 15.6	− 24.0	16.20	16.55	22161.92	0.4973:	
25	133.5	+ 67.5	16.92	17.48	33481.810	0.3533739	+
26	− 91.5	− 45.0	16.90	17.20			
27	+209.4	−234.0	16.30	17.78	39319.557	0.673774	f?
28	+ 65.4	+ 81.0	16.83	17.64	33853.437	0.56724873	−
29	+ 36.0	− 52.5	16.68	17.48	39319.295	0.605497	
30	+ 71.4	− 97.5	16.50	16.90			
31	+ 5.4	+ 36.6	16.44	17.36	39319.110	0.53249	
32	−138.0	− 42.0	16.84	17.78	39319.440	0.52834	
33	+ 2.4	− 60.6	16.95	17.25			
34	− 6.0	+ 7.5	16.06	16.73			
35	+231	+ 27	16.78	17.75	39319.772	0.543771	
36	− 12	0	16.0	16.8			
37	+ 7	8	15.5	16.5			
38	+ 5	− 9	16.6	17.3			
39	+195	+243	16.8	17.6			
40	+ 18	+ 16	16.4	17.4			
41	15	− 20	16.7	17.5			
42	+ 12	+ 3					red

Nobili, Asiago Contr 83 (1957); Dickens and Flinn, MN 158.99 (1972); Dickens, Preprint (p) (1972); Letter, V42 unpub (1972)
S55a, S57, S59, R62a, S62, S64, L65, R65, S67, S69

NGC 7006 α 20^{h}59^m.1, δ +16° 00′

1	−177.9	+114.8	18.20	19.60	26918.939	0.492729	
2	− 35.3	− 37.3	18.25	19.50	35453.245	0.586986	
3	− 24.4	− 34.2	18.55	19.65	27209.945	0.560557	
4	− 21.0	− 41.1	not var				
5	− 20.9	− 38.4	18.45	19.50	35419.240	0.534713	
6	− 13.5	− 44.5	18.40	19.60	27039.626	0.498030	
7	+ 3.2	− 36.9	not var				
8	− 34.4	− 13.5	18.70	19.50	35342.700	0.608289	
9	− 39.4	− 16.6	not var				
10	− 42.8	− 11.8	18.45	19.80	35403.638	0.542907	
11	−148	− 50	18.35	19.65	35428.232	0.576036	
12	−122.0	− 64.0	18.35	19.55	35419.410	0.574039	
13	−102.7	− 40.2	18.30	19.60	35453.274	0.551647	
14	55.3	+128.3	18.35	19.55	35459.269	0.560358	
15	− 11.5	+114.8	18.40	19.50	35429.250	0.588067	
16	39.6	+135.5	18.35	19.55	35429.240	0.537582	

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 7006 (continued)							
17	− 99.3	+ 85.5	18.35	19.60	35429.201	0.511494	
18	− 29.6	− 89.5	18.55	19.65	35034.330	0.603706	
19	− 0.6	− 25.3	16.70	17.90	35630.93	92.17	red SR
20	− 21.2	− 24.4	18.70	19.45	35003.270	0.577476	
21	− 21.5	− 18.4	18.60	19.50	34978.700	0.568968	2 Alt Ps
22	− 12.6	− 15.8	18.40	19.60	35727.400	0.526927	
23	− 27.6	− 7.5	18.50	19.60	27274.873	0.608042	
24	− 25.8	− 2.9					blended
25	− 19.2	+ 5.2	18.80	19.60	26975.580	0.532792	
26	− 10.6	− 2.9	18.55	19.60	34978.710	0.607364	Alt 0.540
27	− 11.8	+ 0.3	18.30	19.25	26975.650	0.522321	
28	− 15.8	+ 4.3	18.75	19.60	35657.925	0.560987	Alt 0.5619
29	+ 35.0	+ 31.6	18.40	19.60	27033.640	0.559195	
30	+ 5.2	+ 16.6	18.70	19.70			
31	+ 10.0	+ 11.2	18.65	19.55	26891.945	0.563126	
32	+ 20.9	+ 13.8	18.50	19.50	36376.920	0.585572	
33	+ 31.9	+ 22.4	18.50	19.50	34978.735	0.556812	
34	+ 26.4	+ 9.2	18.75	19.30	prob not var		
35	+ 36.2	− 2.0	18.60	19.55	35419.260	0.596309	P var?
36	+ 25.5	− 3.7	18.75:	19.35	27274.850	0.437847	2 Alt Ps
37	+ 18.9	− 3.4	18.40:	19.45	37274.860	0.567920	blended
38	+ 21.5	− 18.4	18.70	19.50	26919.700	0.608599	Alt 0.622
39	+ 11.5	− 25.3	18.50:	19.55	36426.865	0.577261	Alt 0.565
40	+ 9.7	− 14.3	19.15:	19.60:			not RR
41	+ 1.4	− 11.2	18.70	19.60	34978.725	0.495330	Alt 0.499
42	+ 9.5	− 7.5	18.80:	19.30:			
43	4.0	28.7	18.75	19.50	26975.650	0.596656	
44	+133.9	−174.0	18.55	19.41	35017.632	0.58779	
45	−190.0	− 74.4	18.70	19.38	35419.398	0.583858	
46	−125.6	− 54.7	18.85	19.31	35719.429	0.666320	Alt P'
47	183.4	− 22.1	18.60	19.35	35428.253	0.568294	
48	−100.0	+ 90.3	18.70	19.28	35428.240	0.611975	
49	+ 4.8	+ 40.5	18.65	19.60	26891.947	0.581897	
50	42.9	− 7.6	18.60	19.45	35034.300	0.590428	
51	+ 54.3	+ 46.0	18.90	19.35	26918.700	0.642709	
52	1.0	+ 85.5	18.60	19.34	35419.290	0.621746	
53	+ 47.5	9.1	18.75	19.25			
54	+ 3.2	− 30.0	16.95	17.75			red SR
55	254.4	+304.4	18.40	19.60	35017.663	0.537740	
56	− 10.7	11.8	18.75	19.55	36376.920	0.520202	Alt 0.549
57	6.2	12.1	18.65	19.45	26918.890	0.637235	
58	− 14.8	+ 16.2	18.85	19.45	26920.735	0.514982	Alt 0.525
59	− 26.2	+ 9.6	18.55	19.50	35657.875	0.463454	Alt 0.480
60	10.9	+ 7.7	18.85:	19.50			
61	36.2	+ 18.8	18.45	19.50	26918.865	0.589141	
62	21.6	+ 3.0	18.75	19.55	26975.650	0.495233	
63	+ 14.1	+ 22.2	18.65	19.50	27274.860	0.527996	

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 7006 (continued)							
64	+ 21.4	+ 6.2	18.80	19.45			
65	− 8.7	+ 9.9	18.70	19.50	36376.920	0.544081	Alt 0.515
66	+ 28.1	− 2.5	18.75	19.50	26918.730	0.617159	Alt 0.603
67	− 14.1	− 1.1	18.85	19.45			
68	+ 12.7	+ 5.8	18.60	19.50			
69	+ 10.0	+ 3.9	18.90:	19.30:			
70	+ 8.7	0.0	18.40	18.85:			
71	− 3.2	− 13.6	18.80	19.40			
72	+ 26.0	− 0.5	18.80	19.40	26919.675	0.2610439	Alt 0.318
73	− 15.5	0.0	18.40	19.30	35456.600	0.577966	
74	+ 1.2	− 10.8	18.40	19.60	27033.635	0.566850	
75	+152.2	−156.7	18.40	19.00:	27300.600	0.518750	

New vars. 44-52 Rosino and Mannino, 53, 54, Sandage and Wildey, 55-75 Rosino and Ciatti.
Sandage, ASP 66.324 (p) (1954); Rosino and Mannino, Asiago Contr 59 (p) (1955); Mannino, Asiago Contr 84 (1957); Rosino and Ciatti, Asiago Contr 199 (p) (1967); Sandage and Wildey, ApJ 150.469 (p) (1967); Pinto, Priv comm (1972)
S55a, S57, S59, S61, R62a, S62, L65, R65, S67, S69, S70

NGC 7078 (Messier 15) α 21^{h}27^m.6, δ +11°57′							
1	−118.6	+ 24.4	14.48	15.52	20724.394	1.437523	+, Sp
2	−171.7	+ 6.0	15.44	16.00	40442.58	0.6842736	
3	−248.0	− 46.8	15.70	16.29	40072.500	0.3887407	
4	−112.6	−163.6	15.58	16.24	40442.553	0.3135758	
5	−100.3	−212.5	15.66	16.24	40442.510	0.3842142	
6	+ 24.4	+ 76.5	14.93	15.68	25900.190	0.6659671	
7	+ 10.1	+ 73.2	15.56	15.98	25900.102	0.3675643	
8	− 0.6	+126.8	15.18	16.01	20725.103	0.6462446	
9	+ 15.6	+138.7	15.18	16.09	20724.993	0.7152819	
10	+125.6	+ 1.7	15.61	16.18	20724.967	0.3863931	
11	+172.3	− 21.8	15.52	16.22	20725.008	0.3432527	
12	+163.0	− 50.7	15.35	16.12	20724.930	0.5928844	Bℓ
13	+126.6	− 68.8	15.25	16.36	20725.068	0.5749536	
14	+ 84.1	−256.2	15.76	16.35	20725.167	0.3820024	
15	+ 81.7	−304.1	15.26	16.50	20724.991	0.5835687	Bℓ
16	+101.9	+129.8	15.50	15.97			
17	+ 83.7	+110.6	15.62	16.17	20725.001	0.4288924	+, Bℓ
18	+ 77.3	+100.4	15.47	16.05	20725.101	0.3677379	
19	+111.3	+160.4	15.11	16.42	20725.038	0.5723030	Bℓ
20	+ 81.2	− 9.8	15.04	16.07	25900.236	0.6969598	
21	+ 34.4	− 57.5	15.25	16.20			
22	−330.8	− 45.8	15.35	16.36	20724.719	0.7201510	
23	+192.0	+256.1	15.53	16.33	20724.891	0.6326959	Sp, Bℓ
24	−106.7	− 6.1	15.38	15.96	25900.534	0.3696955	
25	+302.9	− 10.7	15.49	16.52	20724.674	0.6653286	
26	+ 23.5	+331.9	15.83	16.37	20725.058	0.4022695	–
27	+222.5	+248.2	not var				

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 7078 (continued)							
28	+309.9	+534.2	15.53	16.53	20724.739	0.6706464	
29	+163.3	+212.2	15.52	16.37	20725.128	0.5749761	+
30	−165.0	− 3.4	15.55	16.01	40442.479	0.4059796	Bℓ
31	−112.6	+245.6	15.74	16.30	20725.044	0.4081781	
32	− 50.4	+107.8	15.01	15.93	25900.589	0.6054003	
33	− 41.2	− 29.4	15.15	15.95	24409.065	0.5839452	
34	− 55.4	− 54.5	prob var				
35	− 34.0	−163.6	15.70	16.32	20725.143	0.3839986	
36	− 27.7	− 81.6	15.12	16.31	25900.141	0.6241424	
37	− 25.2	− 77.4					
38	+ 7.6	−146.2	15.47	16.09	20725.100	0.3752769	
39	+ 20.5	−124.8	15.58	15.98	20725.184	0.3895696	Bℓ
40	+131.8	−116.7	15.46	16.32	20724.834	0.3773302	
41	+ 62.9	− 55.4	15.50	16.15	24409.010	0.6452282	
42	+227.5	− 36.8	15.68	16.36	20725.086	0.3601745	
43	+416.7	+103.2	15.74	16.40	20725.808	0.3959928	
44	+ 91.3	+ 3.0	15.00	16.02	20725.128	0.5955547	–
45	+ 66.9	− 31.0	15.20	16.15	24409.224	0.6773992	
46	+ 56.0	+ 33.2	15.40	16.32			
47	+ 45.7	− 4.3	15.0	16.2	25900.380	0.602799	
48	+ 59.7	+150.6	15.4	15.9	25900.346	0.3649762	
49	+ 40.3	+166.6	14.83	15.42		0.6552054	
50	+165.0	+100.0	15.52	16.12	25900.173	0.2980583	+
51	+ 6.2	+ 91.4	15.56	16.10	25900.280	0.3969565	
52	+192.4	− 22.6	15.36	16.44	20724.800	0.5756132	+
53	− 92.6	−111.0	15.60	16.07	20725.202	0.4141270	
54	+ 10.8	+ 88.4	15.55	16.05	25900.078	0.3995683	
55	+ 65.3	− 18.8	15.49	16.30			
56	+ 57.4	0.0	15.19	16.11			
57	+ 75.2	− 56.4	15.51	16.06	20724.891	0.3492988	
58	− 55.6	+ 8.8	15.5:	16.10			
59	+ 41.3	+ 41.5	15.10	15.95	24409.520	0.5547922	
60	+ 53.4	− 59.3	15.29	16.00			
61	− 67.3	− 40.2	15.2:	15.8:			
62	− 71.6	+ 39.6	15.3:	15.8:		0.3882:	
63	+ 49.8	+ 31.0	15.54	16.44			
64	− 46.2	+ 19.1	15.5	16.0	25900.211	0.355624	
65	−102.4	− 38.7	15.55	16.05	24409.366	0.7183491:	
66	− 68.4	−112.4	15.61	16.13	20725.179	0.3793488	
67	− 86.6	− 10.4	15.5:	16.2:			
68	− 31.8	+ 12.6					
69	− 37.0	− 25.2					
70	− 34.0	− 19.2					
71	− 34.8	− 12.6					
72	− 2.2	+ 34.8	15.0:	15.8:	24409.042	1.1386:	
73	− 3.7	+ 20.0					
74	+ 36.3	− 85.8	15.45	16.30	24409.188	0.296071	
75	+ 2.2	− 30.3					

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 7078 (continued)							
76	+ 0.7	− 28.9					
77	− 11.8	− 22.9					
78	− 6.7	+ 47.4	15.15	15.8:	24409.421	0.398879	
79	+ 21.5	− 23.7					
80	− 47.4	− 26.6	15.1:	15.8:			
81	− 21.5	− 5.9					
82	− 20.7	+ 1.5					
83	+ 16.3	− 7.4					
84	+ 18.5	− 16.3					
85	+ 20.7	+ 2.2					
86	+ 12.6	+ 4.4	13.9	14.8	24410.62	17.109	
87	+ 23.7	− 23.7					
88	+ 2.2	+ 26.6					
89	− 23.7	− 6.7					
90	+ 31.1	+ 4.4					
91	+ 67.3	+ 28.9	15.3:	16.0:			
92	+ 9.6	− 25.2					
93	+ 27.4	− 33.3	15.5:	16.0:			
94	+ 3.7	+ 28.9					
95	+ 5.2	− 40.0					
96	+165.6	+215.0	15.85	16.30	24409.242	0.396046	
97	− 79.5	+ 29.3	15.50	16.25	24409.548	0.696333	
98	− 67.1	+ 46.1	15.4:	15.95	24409.07	0.4701:	
99	+ 29.2	+195.4	15.70	16.10	24410.435	0.277995:	
100	+ 12.5	− 35.8	15.5	16.3	24409.058	0.406114	
101	−104	+540	15.75	16.30	24409.292	0.400360	
102	+ 68.8	+ 31.5	15.70	16.15	24409.119	0.7589:	
103	−251.5	−273.3	15.7	16.4	36070.16	0.368126	
104	−151.6	−642.5	15.6	16.4	36070.22	0.414124	
105	−376.4	−737.3	15.6	17.1	36070.11	0.571155	f?
106	− 30.3	+ 12.8	15.5	16.0			RRc
107	− 32.5	− 21.8	15.5	15.9			RRc
108	− 32.4	− 51.1	15.5	15.9			RRc
109	+ 12.7	− 31.3	15.5	16.1			RRc
110	+ 31.7	− 37.4	15.5	16.0			RRc
111	+ 41.7	− 0.7	15.3	16.2			RR
112	+ 55.5	+ 35.0	15.3	16.3			RR

New vars. 96-98 Izsák, 99 Mannino, 100-102 Notni and Oleak, 103-105 Tsoo Yu-hua, 106-112 Rosino. Three of the corona stars of Kurochkin (1963) are similar to cluster members.

Izsák, Budapest Mitt 28 (1952); Arp, AJ 60.1 (1955); Kholopov, VS 10.253 (1955); Grubissich Asiago Contr 76 (1956); Mannino, Asiago Contr 74, 75 (1956); Izsák, Budapest Mitt 42.63 (1957 Nobili, Asiago Contr 81 (1957); Notni and Oleak, AN 284.49 (1958); Bachmann, AN 284.191 (1958); Mannino, Asiago Contr 110 (1959); Bronkalla, AN 285.181 (1960); Preston, ApJ 134.651 (1961); Yu-hua, Acta Astr Sinica 9.65 (1961); Fritze, AN 287.79 (1963); Kurochkin, VS 14.457 (1963); Makarova and Akimova, VS 15.350 (1965); Rosino, IBVS 327 (1969); Mironov, AC 637.1 (1971); Barlai, Priv comm (1972)

S55a, S57, S59, S61, A62, R62a, S62, P64, S64, L65, R65, St66, S67, C&S69, S69, S70

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 7089 (Messier 2) $\alpha\ 21^h30^m.9$, $\delta\ -01°03'$							
1	+ 25.6	+ 79.4	13.2	14.8	26607.800	15.583	Sp F-G
2	− 45.8	+ 71.1	14.6	16.1	21454.971	0.527858	
3	+222.9	− 39.6	15.1	16.4	26921.952	0.6197006	
4	− 26.8	+ 31.5	15.2	16.6	26628.644	0.564247	
5	− 44.4	+ 2.1	13.2	14.9	26628.644	17.606	Sp F-G
6	+ 11.8	− 45.4	13.2	14.9	22162.928	19.295	Sp F-G
7	+153.0	−189.2	15.1	16.4	27274.901	0.594609	
8	− 66.9	− 56.8	15.1	16.4	27273.896	0.643677	
9	−173.2	−128.2	15.2	16.4	27274.901	0.609291	
10	+ 90.6	+ 38.8	15.2	16.4	27275.909	0.466910	Sp
11	+ 85	+ 8	12.5	14.0	31259.8	67.0	Sp F-G, Min
12	− 62	+ 43	15.1	16.5	26628.776	0.665616	
13	− 77	+ 73	15.1	16.4	26924.972	0.706616	
14	+ 83	− 68	15.4	16.4	20749.843	0.693785	
15	+ 80	− 76	15.7	16.4	26944.880	0.430152	
16	− 31	− 27	15.3	16.5	27275.950	0.655917	
17	+ 2	− 63	15.2	16.3	27274.901	0.636434	
18	−189	−707	15.95	16.85	40088.467	0.36226	P var
19	+235	−502	16.00	17.05	39089.384	0.319403	P var
20	+400	+ 74	16.00	16.75	37162.281	0.2863224	
21	+315	+208	15.75	16.85	39789.516	0.712178	P var

New vars. 18-21, Margoni and Stagni.

Arp, AJ 60.1 (1955); Arp and Wallerstein, AJ 61.272 (1956); Wallerstein, AJ 62.168 (1957), ApJ 127.583 (1958); Kulikov, VS 13.400 (1961); Mantegazza, Bologna Pubbl 8, 5 (1961); Preston, Krzeminski and Smak, ApJ 137.401 (p) (1963); Margoni and Stagni, IBVS 239 (1967); Kukarkin, IBVS 253, 254 (1968); Poole, Master's Thesis, Toronto (1968); Demers, AJ 74.925 (1969); Margoni and Stagni, Asiago Contr 213 (1969); Kukarkin, IBVS 422 (1970); Voroshilov, AC 623.7 (1971); Eggen, ApJ 172.639 (1972)

S55a, S57, S59, S61, R62a, S62, P64, S64, R65, S67, C&S69, S69, S70

NGC 7099 (Messier 30) $\alpha\ 21^h37^m.5$, $\delta\ -23°25'$							
1	+ 30.0	− 60.6	15.0	16.5	32060.525	0.743608	
2	+ 58.6	− 126.2	14.92	16.04	32060.46	0.6535049	
3	− 96.7	− 39.6	14.91	16.06	32039.59	0.69632	
4	−339:	− 51:	16.1	[18	32450	9-10	UG
5							Terzan 1
6							Terzan 2
7							Terzan 3
8							Terzan 4
9							Terzan 5
10							Terzan 6
11							Terzan 7
12							Terzan 8

No.	x″	y″	Max.	Min.	Epoch	Period	Remarks
NGC 7099 (continued)							
Variables of Terzan (1968) identified on print. Rosino, Asiago Contr 117 (1961); Terzan, Haute Prov Publ 9, 24 (p) (1968); Dickens, Preprint (1972) S55a, R57, S57, S59, R62a, S62, S64, R65, St66, S69, S70							
Palomar 12 α 21^{h}43^m.7, δ −21°28′							
1	−97.4	+129.8	20.3	21.1			Zwicky, RR
2	−80.8	+136.8	20.3	21.5			RR, K&R
3	−51.2	+102.0	18.5	22			103a-D plate K&
Zwicky, Morphological Astronomy, p. 205 (p) (1957); Kinman and Rosino, ASP 74.503 (p) (1962) R61, S61, S64, S69							
Palomar 13 α 23^{h}04^m.2, δ +12°28′							
1	−32	+ 32	17.35	18.55	35759.505	0.538158	P var
2	+11	− 10	17.45	18.60	35782.381	0.597111	
3	− 8	+ 21	17.35	18.55	36455.770	0.578168	
4	+76	−300	17.55	18.65	35721.615	0.575340	
All four new variables, Rosino Rosino, Asiago Contr 85 (p) (1957); Ciatti, Rosino and Sussi, Bamb Kl Veröff 4, 40.228 (1965) R57, S59, R61, S61, S62, S67, S69							
NGC 7492 α 23^{h}05^m.7, δ −15°54′							
1	+19.5	+ 96.0	17.07	17.67	37499.603	0.804873	
2	−19.5	+ 49.5	16.91	17.31		0.292045	
3	+30.0	−253.5	17.39	17.79		0.270998	
4	−36.5	−116.0	15.66	15.96		17.9	red
Three suspected variables, Barnes (1968), who found variables 2-4. Kinman and Rosino, ASP 74.503 (1962); Barnes, Priv comm (1966), AJ 72.291 (1967), AJ 73.579 (1968) S55a, S57, S59, S61, S62, S64, S67, S69, S70							

INDEX OF ABBREVIATIONS USED IN REFERENCES, LISTED CHRONOLOGICALLY

S55a Sawyer, H., Toronto Publ 2, 2: A Second Catalogue of Variable Stars in Globular Clusters, Table II, Summary of Variable Stars in 72 Globular Clusters (1955)

S55b Sawyer, H., Toronto Publ 2, 2: Table I, Thirty-Four Globular Clusters Not Searched for Variables (1955)

R57 Rosino, L., Budapest Mitt 42: Problems of Variable Stars in Globular Clusters (1957)

S57 Sawyer Hogg, H., IAU Trans 9.548, Table 3a: Fifty-Nine Globular Clusters (1957)

S59 Sawyer Hogg, H., Handbuch der Physik, ed. S. Flügge (Berlin: Springer Verlag), p. 181; Star Clusters (1959)

R61 Rosino, L., IAU Trans **11B**.300: Work Being Carried Out at the Asiago Observatory (1962)

S61 Sawyer Hogg, H., IAU Trans 11A.271: Report of Sub-Commission 27b, Variable Stars in Clusters (1962)

A62 Arp, H.C., Symposium on Stellar Evolution, 1960, La Plata (1962)

R62a Rosino, L., Pad Com 29, Tables 3 and 4: Clusters Observed for Variables (1962)

R62b Rosino, L., Pad Com 29, Table 1: Clusters Never Observed for Variables (1962)

R62c Rosino, L., Pad Com 29, Table 2: Clusters Insufficiently Observed for Variables (1962)

S62 Sawyer Hogg, H., Bamb Kl Veröff 34.8: Numbers and Kinds of Variables in Globular Clusters (1962)

F&L63 Fourcade, C. R., and Laborde, J. R., La Plata Bol 6.111: Estrellas variables en cumulos globulares (1963)

P64 Preston, G., Ann Rev Astr Ap 2.23: The RR Lyrae Stars (1964)

S64 Sawyer Hogg, H., IAU Trans 12A.390: Variable Stars in Star Clusters (1965)

L65 Lohmann, W., AN 289.99: Perioden-Helligkeits-Beziehungen von RR Lyrae-Sternen in Kugelförmigen Sternhaufen (1965)

R65 Rosino, L., Bamb Kl Veröff 4.40.98: Characteristics and Absolute Magnitudes of the RR Lyrae Variables in Globular Clusters (1965)

FLA66 Fourcade, C. R., Laborde, J. R., and Albarracin, J., Atlas y Catalogo de estrellas variables en cumulos globulares al sur de $-29°$, Cordoba (1966)

St66 Stothers, R., AJ 71.943: The Ultraviolet Dwarfs: A New Class of Degenerate Stars (1966)

S67 Sawyer Hogg, H., IAU Trans 13A.555: Report of the Committee on Variable Stars in Clusters (1967)

C&S69 Coutts, C., and Sawyer Hogg, H., Toronto Publ 3.1: Period Changes of RR Lyrae Variables in the Globular Cluster Messier 5 (1969)

S69 Sawyer Hogg, H., Non-Periodic Phenomena in Variable Stars, ed. L. Detre, p.475: The Third Catalogue of Variable Stars in Globular Clusters (1969)

S70 Sawyer Hogg, H., IAU Trans 14A.291: Report of the Committee on Variable Stars in Clusters (1970)

F72 Feast, M., Preprint: Red Variables in Globular Clusters, in the Galactic Centre and in the Solar Neighbourhood (1972)

INDEX OF ABBREVIATIONS OF PUBLICATIONS

AAS Bull	Bulletin of the American Astronomical Society
AAVSO Abstr	Abstract of the American Association of Variable Star Observers
AC	Astronomical Circular. Bureau of Astronomical Information of the Academy of Sciences of USSR, Moscow
Acta Astr Sinica	Acta Astronomica Sinica
AG Mitt	Mitteilungen der Astronomischen Gesellschaft
AJ	The Astronomical Journal. Published by the American Astronomical Society
AN	Astronomische Nachrichten. Akademie-Verlag, Berlin
Ann Aph	Annales d'Astrophysique. Revue Internationale trimestrielle
Ann Rev Astr Ap	Annual Review of Astronomy and Astrophysics. Palo Alto
ApJ	The Astrophysical Journal, An International Review of Spectroscopy and Astronomical Physics, Chicago
ApJ Suppl	The Astrophysical Journal. Supplement Series
Asiago Contr	Contributi dell' Osservatorio Astrofisico dell' Università di Padova in Asiago
ASP	Publications of the Astronomical Society of the Pacific. San Francisco
Astr Abh Hoffmeister	Astronomische Abhandlungen Prof. Dr. C. Hoffmeister zum 70. Geburtstag Gewidmet. Leipzig
Astr and Ap	Astronomy and Astrophysics
BAC	Bulletin of the Astronomical Institutes of Czechoslovakia. Prague
Bamb Kl Veröff	Kleine Veröffentlichungen der Remeis-Sternwarte zu Bamberg
Bamb Veröff	Veröffentlichungen der Remeis-Sternwarte zu Bamberg
BAN	Bulletin of the Astronomical Institutes of the Netherlands. Haarlem
BAN Suppl	Bulletin of the Astronomical Institutes of the Netherlands. Supplement Series
Berg Abh	Abhandlungen aus der Hamburger Sternwarte. Hamburg-Bergedorf
Bologna Pubbl	Pubblicazzioni dell' Osservatorio astronomico universitario di Bologna
Budapest Mitt	Mitteilungen der Konkoly-Sternwarte zu Budapest-Svábhegy
Cordoba Repr	Observatorio de Cordoba. Reprint Series
HA	Annals of the Astronomical Observatory of Harvard College. Cambridge, USA
Haute Prov Publ	Publications de l'Observatoire de Haute Provence
HB	Bulletin of the Harvard College Observatory. Cambridge, USA
HC	Harvard College Observatory. Circular. Cambridge, USA
IAU Coll	International Astronomical Union, Colloquium
IAU Draft Reports	International Astronomical Union. Agenda and Draft Reports
IAU Trans	Transactions of the International Astronomical Union
IBVS	Information Bulletin on Variable Stars of Commission 27 of the International Astronomical Union. Budapest
Inf Bull So Hemis	Information Bulletin for the Southern Hemisphere. La Plata
JRASC	The Journal of the Royal Astronomical Society of Canada
JO	Journal des Observateurs. Marseilles
La Plata Bol	Asociacion Argentina de Astronomia. Boletin. La Plata
La Plata Symp	Symposium on Stellar Evolution, 1960. La Plata
Leaflet	Publications of the Astronomical Society of the Pacific. Leaflet. San Francisco
Leiden Ann	Annalen van de Sterrewacht te Leiden

Louv Publ	Publications du Laboratoire d'Astronomie et de Géodésie de l'Université de Louvain
Lyon Publ	Publications de l'Observatoire de Lyon. Série I. Astronomie
MN	Monthly Notices of the Royal Astronomical Society. London
Mt Wils Contr	Contributions from the Mount Wilson Observatory
MVS	Mitteilungen über veränderliche Sterne. Herausgegeben von der Sternwarte Sonneberg
NASA Tech Tr	National Aeronauties and Space Administration, USA. Technical Translation
Obs	The Observatory. Monthly Review of Astronomy. Oxford
Pad Com	Osservatorio Astronomico di Padova. Comunicazioni
Proc Astr Soc Aust	Proceedings of the Astronomical Society of Australia. Sydney
Pulk Mitt (Isw)	Mitteilungen (Istwestija) der russischen Hauptsternwarte zu Pulkovo
Quart JRAS	The Quarterly Journal of the Royal Astronomical Society
RAJ	Russian Astronomical Journal (until 1931). Astronomical Journal of Soviet Union
Royal Obs Ann	Royal Observatory Annals. Herstmonceux: Royal Greenwich Observatory
Royal Obs Bull	Royal Observatory Bulletins. Joint Publications of the Royal Greenwich Observatory, Herstmonceux; Royal Observatory, Cape of Good Hope
Rutherfurd Contr	Contributions from the Rutherfurd Observatory of Columbia University, New York
SAI	Memorie della Società Astronomica Italiana
Sky Tel	Sky and Telescope. Harvard College Observatory, Cambridge, USA
Sonn Veröff	Veröffentlichungen der Sternwarte zu Sonneberg
Soviet Astr AJ	Soviet Astronomy AJ. A translation of the Astronomical Journal of the Academy of Sciences of USSR. Published by the American Institute of Physics, Inc., New York
Spec Vat Ric	Specola Astronomica Vaticana. Richerche Astronomiche
Toronto Comm	Communications from the David Dunlap Observatory, University of Toronto
Toronto Publ	Publications of the David Dunlap Observatory, University of Toronto
UOC	Circular of the Union Observatory
VS	Variable Stars. Academy of Sciences of USSR, Moscow
VS Supp	Variable Stars. Supplement Series. Moscow
ZAp	Zeitschrift für Astrophysik. Berlin-Göttingen-Heidelberg