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

BY

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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 $-29^{\circ}$ 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 $10^{\circ}$ 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

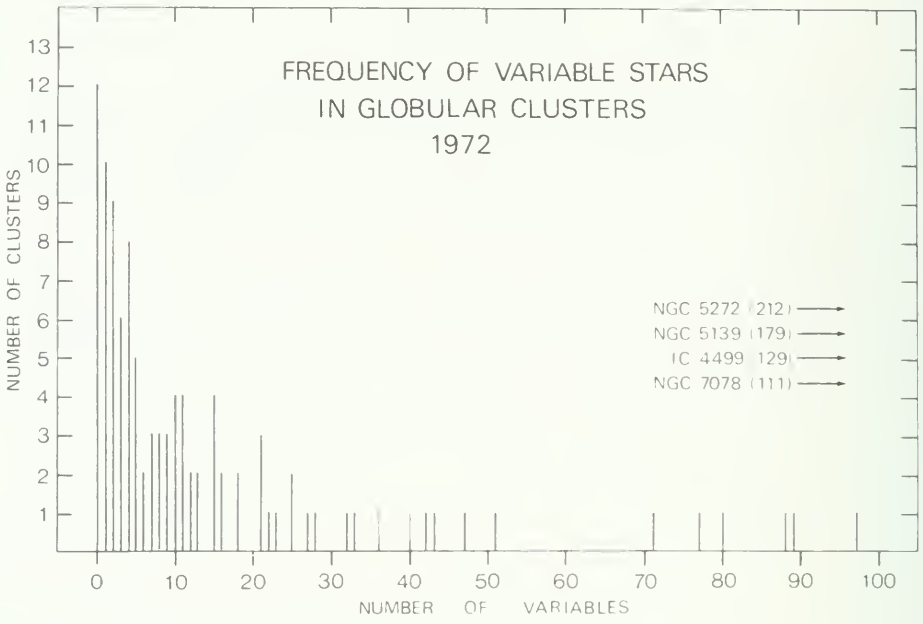


*Figure 1* Distribution of the known, published variables per cluster.

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 | | | | | | | |

| 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) | | | | | | | | | |
| 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-

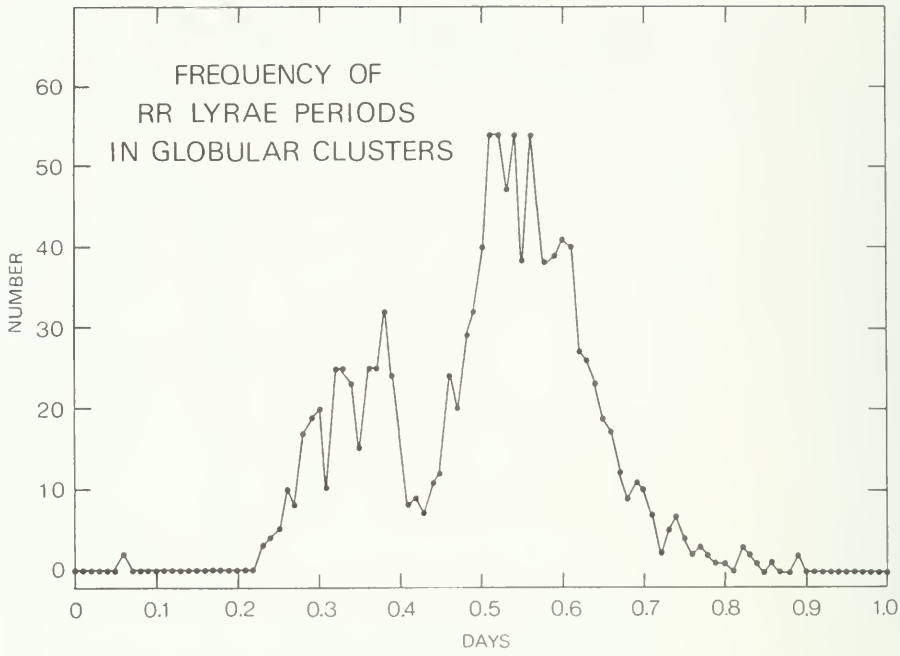


*Figure 2* Numbers of RR Lyrae periods at intervals of 0.01 days.

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 "Bℓ"

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) $\alpha$ $00^h21^m.9$, $\delta$ $-72°21'$ | | | | | | | |
| 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** $\alpha\ 00^h50^m.2,\ \delta\ -26°52'$ | | | | | | | |
| 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** $\alpha\ 01^h01^m.6,\ \delta\ -71°07'$ | | | | | | | |
|---|---|---|---|---|---|---|---|
| 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** $\alpha\ 13^h10^m.9,\ \delta\ -55°25'$ | | | | | | | |
|---|---|---|---|---|---|---|---|
| 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** $\alpha\ 03^h25^m.7$, $\delta\ +79°28'$

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

**Palomar 2** $\alpha\ 04^h43^m.1$, $\delta\ +31°23'$

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

**NGC 1851** $\alpha\ 05^h12^m.4$, $\delta\ -40°05'$

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 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) $\alpha\ 05^h22^m.2$, $\delta\ -24°34'$

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 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 $\alpha$ 06$^h$47$^m$.2, $\delta$ −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 $\alpha$ 07$^h$34$^m$.8, $\delta$ +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$^h$10$^m$.9, $\delta$ -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$^h$03$^m$.0, $\delta$ +00°18′ | | | | | | | |
| V1 on print | | | | | | prob RR | B&S |
| Burbidge and Sandage, ApJ 127.527 (p) (1958) | | | | | | | |
| S61, S62, S69 | | | | | | | |
| NGC 3201 $\alpha$ 10$^h$15$^m$.5, $\delta$ −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: | Bℚ, 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

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Palomar 4 $\alpha$ $11^h26^m.6$, $\delta$ +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

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NGC 4147 $\alpha$ $12^h07^m.6$, $\delta$ +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

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**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

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**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 | Fl 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 1 yr), 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 ($\omega$ 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 | 0.407[illegible] | + |
| 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 | 0.5944554 | + |
| 109 | + 153.91 | − 57.13 | 13.99 | 15.03 | 27000.67 | 0.7440615 | [illegible] |
| 110 | + 158.94 | − 87.08 | 14.41 | 14.96 | 26524.256 | 0.3221021 | |
| 111 | + 27.26 | − 0.30 | 14.18 | 14.80 | 27000.02 | 0.7629005 | + |
| 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 | cst 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 | Bℓ |
| 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 | Bℓ |
| 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 | Bℓ |
| 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 | Bℓ |
| 68 | + 21.9 | + 174.8 | 15.0 | 16.0 | | 0.3559732 | Bℓ |
| 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: | Bℓ |
| 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 | Bℓ |
| 80 | + 416.8 | + 284.6 | 14.80 | 16.17 | 15021.433 | 0.5384827 | Bℓ |
| 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 $\alpha\ 13^h43^m.0, \delta\ -51°07'$ | | | | | | | |
| 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 $\alpha\ 14^h03^m.2, \delta\ +28°46'$ | | | | | | | |
| 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$^h$27$^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$^h$36$^m$.7, $\delta$ −26°19′ | | | | | | | |
| No variables found. | | | | | | | |
| Baade, ASP 46.52 (1934) | | | | | | | |
| S55a, S59, R62c, S62, S69 | | | | | | | |
| **IC 4499** $\alpha$ 14$^h$52$^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 $\alpha$ 15$^h$24$^m$.4, $\delta$ −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

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| NGC 5946 $\alpha$ 15$^h$31$^m$.8, $\delta$ −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

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| NGC 5986 $\alpha$ 15$^h$42$^m$.8, $\delta$ −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

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| NGC 6093 (Messier 80) $\alpha$ 16$^h$14$^m$.1, $\delta$ −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

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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

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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

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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) $\alpha$ $16^h39^m.9$, $\delta$ +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) $\alpha$ 16$^h$44$^m$.6, $\delta$ −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** $\alpha$ 16$^h$45$^m$.6, $\delta$ +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** $\alpha$ 16$^h$50$^m$.4, $\delta$ −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) $\alpha$ 16$^h$54$^m$.5, $\delta$ −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 IV-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

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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

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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

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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

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| No. | x″ | y″ | Max. | Min. | Epoch | Period | Remarks |
|---|---|---|---|---|---|---|---|
| NGC 6293 $\alpha$ 17$^h$07$^m$.1, $\delta$ −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 $\alpha$ 17$^h$11$^m$.4, $\delta$ −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 $\alpha$ 17$^h$13$^m$.4, $\delta$ −28° 05′ | | | | | | | |
| S55b, R62b | | | | | | | |
| NGC 6325 $\alpha$ 17$^h$15$^m$.0, $\delta$ −23° 42′ | | | | | | | |
| S55b, R62b | | | | | | | |

| No. | x″ | y″ | Max. | Min. | Epoch | Period | Remarks |
|---|---|---|---|---|---|---|---|
| **NGC 6333 (Messier 9)** $\alpha\ 17^h16^m.2, \delta\ -18°28'$ | | | | | | | |
| 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)** $\alpha\ 17^h15^m.6, \delta\ +43°12'$ | | | | | | | |
| 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** $\alpha\ 17^h18^m.2, \delta\ -19°32'$

S55b, R62b

| No. | x″ | y″ | Max. | Min. | Epoch | Period | Remarks |
|---|---|---|---|---|---|---|---|
| **NGC 6352** $\alpha\ 17^h21^m.6$, $\delta\ -48°26'$ | | | | | | | |
| 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

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**NGC 6355** $\alpha\ 17^h20^m.9$, $\delta\ -26°19'$

S55b, R62b

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**NGC 6356** $\alpha\ 17^h20^m.7$, $\delta\ -17°46'$

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 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 I 1, 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

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**NGC 6362** $\alpha\ 17^h26^m.6$, $\delta\ 67°01'$

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 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 | VH 15 |
| 7 | + 22 | +104 | 13.7 | 14.5 | 36565.724 | 0.5215674 | VH 6 |
| 8 | 263 | +108 | 14.8 | 15.3 | 36566.080 | 0.3810811 | VH 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

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NGC 6366 $\alpha\ 17^h25^m.1$, $\delta\ -05°02'$

| | | | | |
|---|---|---|---|---|
| 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

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Haute Provence 1 $\alpha\ 17^h28^m.5$, $\delta\ -29°57'$

| | |
|---|---|
| 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

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**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

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**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

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**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

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**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

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**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

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**Palomar 6** $\alpha$ 17$^h$40$^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

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**NGC 6426** $\alpha$ 17$^h$42$^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, HA 109.19 (1942) (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

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**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

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**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

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

One unpublished variable, Baade. S55a.

S57, S59, R62c, S62, S69

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**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

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

R62b

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**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 $\alpha$ 18$^h$14$^m$.6, $\delta$ 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 $\alpha$ 18$^h$20$^m$.5, $\delta$ −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) $\alpha$ 18$^h$21$^m$.5, $\delta$ 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

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **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

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **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

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**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) $\alpha$ 18$^h$33$^m$.3, $\delta$ −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) $\alpha$ 18$^h$40$^m$.0, $\delta$ −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 Kl 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

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**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

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**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

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**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

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Palomar 10 $\alpha$ 19$^h$16$^m$.0, $\delta$ +18°28′

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

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NGC 6809 (Messier 55) $\alpha$ 19$^h$36$^m$.9, $\delta$ −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

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Palomar 11 $\alpha$ 19$^h$42$^m$.6, $\delta$ −08°09′

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

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NGC 6838 (Messier 71) $\alpha$ 19$^h$51$^m$.5, $\delta$ +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

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| No. | x″ | y″ | Max. | Min. | Epoch | Period | Remarks |
|---|---|---|---|---|---|---|---|
| **NGC 6864** (Messier 75) $\alpha\ 20^h03^m.2$, $\delta\ -22°04'$ | | | | | | | |
| 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** $\alpha\ 20^h31^m.7$, $\delta\ +07°14'$ | | | | | | | |
| 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) $\alpha\ 20^h50^m.7$, $\delta\ -12°44'$

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 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** $\alpha\ 20^{h}59^{m}.1$, $\delta\ +16^{\circ}\,00'$

| | | | | | | |
|---|---|---|---|---|---|---|
| 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 | + 35.3 | +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) $\alpha\ 21^{h}27^{m}.6$, $\delta$ +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** $\alpha\ 21^h43^m.7$, $\delta\ -21°28'$ | | | | | | | |
| 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&R |
| Zwicky, Morphological Astronomy, p. 205 (p) (1957); Kinman and Rosino, ASP 74.503 (p) (1962) R61, S61, S64, S69 | | | | | | | |
| **Palomar 13** $\alpha\ 23^h04^m.2$, $\delta\ +12°28'$ | | | | | | | |
| 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** $\alpha\ 23^h05^m.7$, $\delta\ -15°54'$ | | | | | | | |
| 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 | Veroffentlichungen 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 |

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|---|---|
| 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 Aeronautics 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 |