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STUDIES OF THE VIRGO CLUSTER. II. A CATALOG OF 2096 GALAXIES IN THE VIRGO CLUSTER AREA

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ABSTRACT

A catalog of 2096 galaxies within an area of ~ 140 deg^2 roughly centered on the Virgo cluster at $\alpha \sim 12^h25^m$ and $\delta \sim 13°$ is presented. It should be an essentially complete listing of all certain and possible cluster members, independent of morphological type, down to $B_T \sim 18$ (corresponding to $M_{B_T} \sim -13.7$, assuming a Virgo cluster distance modulus of $m - M = 31.7$), and it contains in addition many fainter dE and Im members down to $B_T \sim 20$ ($M_{B_T} \sim -11.7$), as well as all galaxies listed in the Zwicky catalog whether member or background. The catalog is based on 67 blue (Eastman 103aO) plates of size 50×50 cm taken between 1979 and 1982 with the du Pont 2.5-m reflector of the Las Campanas Observatory, which combines the features of large-scale (10".8 mm^{-1}) and wide-field (2.3 deg^2) photography. Cluster membership, in large measure, is essentially decided by galaxy morphology alone. There is no question as to membership for most dwarf members which can be recognized from their low surface brightness. For giants and the rare class of high-surface-brightness dwarfs, the membership rests on velocity data. The velocities range from the most negative values found to an upper limit of $v = 2700$ km s^{-1} (heliocentric). 1277 of the catalog entries are considered to be members of the Virgo cluster, 574 to be possible members, and 245 to be background (Zwicky) galaxies. For all 2096 galaxies, the catalog gives the coordinates accurate to $\lesssim 10''$; the morphological type in the extended Hubble system; the total B magnitude with a mean error of ~ 0.1 mag for bright galaxies, and ~ 0.5 mag for the faintest ones; and the major-axis diameter measured at an isophotal level of ~ 25.5 B/arcsec^2. Major-to-minor axis ratios are given for all galaxies brighter than $B_T = 18$, as well as for many fainter ones. Heliocentric velocities are listed for 572 entries.

I. INTRODUCTION

Existing investigations on galaxies are strongly biased in favor of luminous, massive galaxies. This trend, which has a variety of reasons, is certainly also caused by the fact that most catalogs of galaxies underrepresent the number of low-luminosity objects, which is clear for apparent-magnitude-limited catalogs because of the much larger volume over which luminous galaxies can be sampled, but in addition, low-luminosity galaxies are discriminated against because of their low surface brightness.

To obtain a representative sample of intrinsically bright *and* faint galaxies it is necessary to search a volume sample down to a faint absolute magnitude limit including all low-surface-brightness galaxies. To define such a volume sample, an enormous number of individual distances would be required, which is technically impossible. The only possibility is then to study the members of a cluster of galaxies.

Because of its nearness, the *Virgo cluster* of galaxies is clearly the prime candidate for a survey. The great potential of this cluster, exhibiting the full range of luminosities and morphological types, could not, however, be exploited before it became possible to separate the *faint* cluster members from the overwhelming number of background galaxies. The difficulty is clearly shown in the older literature.

After the first exploratory papers on what is now known as the Virgo cluster by Messier (1781), the Herschels, Schwassmann (1902), Hinks (1911, 1914), and Shapley and Ames (1926), Ames (1930) compiled a catalog of 2278 nebulae brighter than ~ 18 mag in the Virgo cluster region. An analysis of this catalog (Shapley and Ames 1929) resulted in the conclusion: "The main (Virgo) group is seen to fade into the general background at the fifteenth magnitude, but there are clear evidences of its presence at least one magnitude fainter." This cautious statement, which is explained by the technical limitations of detecting lower-luminosity members of low surface brightness with small scales and slow emulsions, remained unchallenged for a quarter of a century, while the knowledge of individual brighter members and their distribution within the cluster increased enormously (e.g., Shapley and Ames 1930; Smith 1936; Reiz 1941; de Vaucouleurs 1956, 1961, 1975; Zwicky 1957, 1969; Abell 1975). Membership assignments relied heavily on redshift data, which in turn could be obtained only for galaxies with moderately high surface brightness and/or 21-cm line detections. After Hubble and Humason (1931) had provided the first seven redshifts of Virgo cluster members, the redshift data for the brighter members increased by more than a factor of 50 (e.g., Humason, Mayall, and Sandage 1956; later a compilation was given by Kraan-Korteweg 1982; for a still more recent list see Huchra 1984), but the still rising luminosity function of cluster members suggested that one had not yet reached the faintest members.

A new phase of the Virgo cluster research was initiated by

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Reaves (1956), who isolated new faint cluster members on the basis of their low surface brightness. Also, the introduction of the luminosity classification of spiral and irregular galaxies enabled van den Bergh (1959) to identify cluster members on purely morphological grounds. While the spiral-structure criterion fails for the extreme dwarfs, the surface-brightness criterion was subsequently applied successfully by several authors (Reaves 1962, 1983; van den Bergh 1966; Karachentseva 1968).

However, these dwarf surveys were based on Palomar 48″ Schmidt plates, where the advantage of a large field (6°×6°) has to be paid for by a small scale (67″ mm^{-1}) and by a loss of morphological structure in the galaxies. As cluster members are largely identified on morphological grounds, an improvement of the resolution of morphological structure is crucial for any progress in the sampling of Virgo cluster galaxies. The demanded resolution could be provided by the 5-m Hale telescope, for instance, but it would require about one thousand exposures to cover the cluster area of ~6° radius, which is clearly an impossible task.

This technical difficulty can now be overcome with the du Pont 2.5-m telescope on Las Campanas which, by its special optical design, combines high resolution (10″.8 mm^{-1}, i.e., the same resolution as the Hale 5-m telescope) with a large field of 1°.5×1°.5. In 1979, we began a photographic survey of the Virgo cluster to the faintest convenient limit of the du Pont reflector. By 1983, essentially the whole cluster area was covered with 67 plates (format 50×50 cm). The baked 103aO emulsions used reach the sky limit after an exposure of about an hour. The plates therefore reveal low-surface-brightness objects with much additional detail to almost the same limit as an earlier, small-scale IIIaJ survey of the Virgo cluster with the 48″ Palomar Schmidt telescope (Reaves 1983).

Subsequent work with the 67 du Pont survey plates led to the present catalog of 2096 galaxies in the Virgo cluster area. In Paper I of this series (Binggeli, Sandage, and Tarenghi 1984), we have set standards to derive magnitudes for the faint catalog galaxies. The catalog data are the basis of the remaining Papers III–VII of the series, three of which have been published so far (Sandage and Binggeli 1984; Sandage, Binggeli, and Tammann 1985a,b).

Individual and statistical galaxian properties are known to vary with the surrounding mean mass density (e.g., Dressler 1984). This fact should be taken as a warning in case the properties of the Virgo cluster sample were to be applied indiscriminately to different regions of the universe.

The present study is discussed in Sec. II, while the actual Virgo cluster catalog follows in Sec. III. A comparison with Reaves' (1983) work is given in Appendix B. Special types of dwarf galaxies are listed and discussed in Appendix C.

II. THE SURVEY

a) Observations

Using the Cassegrain camera of the Las Campanas du Pont 2.5-m telescope, we have photographed the 6° radius core of the Virgo cluster plus a tip of the "Southern Extension" on 67 blue (Eastman 103aO) plates of size 50×50 cm having a plate scale of 10.8 arcsec mm^{-1}. Figure 1 is a map of the 67 survey fields. Every field is 1°.5 on a side, covering an area of 2.3 deg^2. Adjacent fields overlap by 6 arcmin. The whole survey area embraces ~140 deg^2 on the sky, or ~15 m^2 on glass.

The obervations were done in three runs, in January/February 1979, March 1980, and March/April 1982, most of the time under excellent seeing conditions. Table I(a) gives the plate data. All plates were baked in forming gas for ~3^h30^m at 65 °C. The exposure time varied between 45 and 75 min, depending on the sensitivity of the emulsion batch. The plates of the 1979 run were taken through a Wratten 2*c* filter; the rest are with no filter. As argued in Paper I (Binggeli, Sandage, and Tarenghi 1984), this filter difference should have no bearing on the *B*-magnitude system.

Virgo fields 21 and 61 are slightly misplaced with respect to the neighboring fields (see Fig. 1), resulting in two small strips within the survey area that are not covered by any du Pont plate. No galaxy was missed there, however, as the IIIaJ Schmidt plates previously used by Reaves (1983), which cover a much larger area, were always inspected in parallel with the large-scale Las Campanas plates. Data for the Schmidt plates are given in Reaves (1983).

b) Selection Of Galaxies: The Cluster Membership Problem

The 67 large-scale plates were thoroughly inspected many times—with and without the aid of an eyepiece. The task was to possibly identify all members of the Virgo cluster down to the limiting magnitude of $B_T = 20$ (see Sec. II *c*), discriminating against thousands of faint background galaxies. This was largely done on morphological grounds, with some guidance from velocity data.

1) Membership criteria

The criteria applied to distinguish the cluster members are:

(1) Surface Brightness. Typical dE and Im galaxies have *low* surface brightness. The correlation between absolute magnitude and surface brightness is well quantified for dE galaxies (Paper I, Fig. 8) and it has also been found for S-Im galaxies by several authors (e.g., van den Bergh 1960; for an illustration see Sandage and Tammann 1981, RSA). Therefore the great number of low-surface-brightness galaxies are genuine dwarf galaxies and cannot lie beyond the Virgo cluster.

(2) Resolution into knots (steller associations and H II regions). The criterion can be applied to late-type galaxies with active star formation. Spiral and irregular galaxies in the background appear much less resolved than their counterparts in the Virgo cluster. This simple fact served well to support criterion (1) for irregulars and criterion (3) for spirals.

(3) Luminosity class. The luminosity classes provide for some spiral galaxies valuable clues as to membership. For instance, a small, faint luminosity class I galaxy with beautifully developed spiral arms cannot be a cluster member; on the other hand, a large, bright luminosity class III–IV spiral cannot belong to the background.

(4) Radial velocity. As argued below, all galaxies with negative heliocentric velocities are *bona fide* cluster members. With an observed v(minimum) of ~ -700 km s^{-1} and v(mean) ~960 km s^{-1} one concludes, assuming a symmetric velocity distribution of cluster members, that v(maximum) ~2700 km s^{-1}. Due to the fortunate circumstance that there is clearly a low-density region behind the Virgo cluster core (cf. Ftaclas *et al.* 1984, and references therein), the definition of the upper velocity bound is not critical for galaxies in the main cluster region. The velocity criterion applies to all galaxies, of course, and it is decisive for giant E and S0

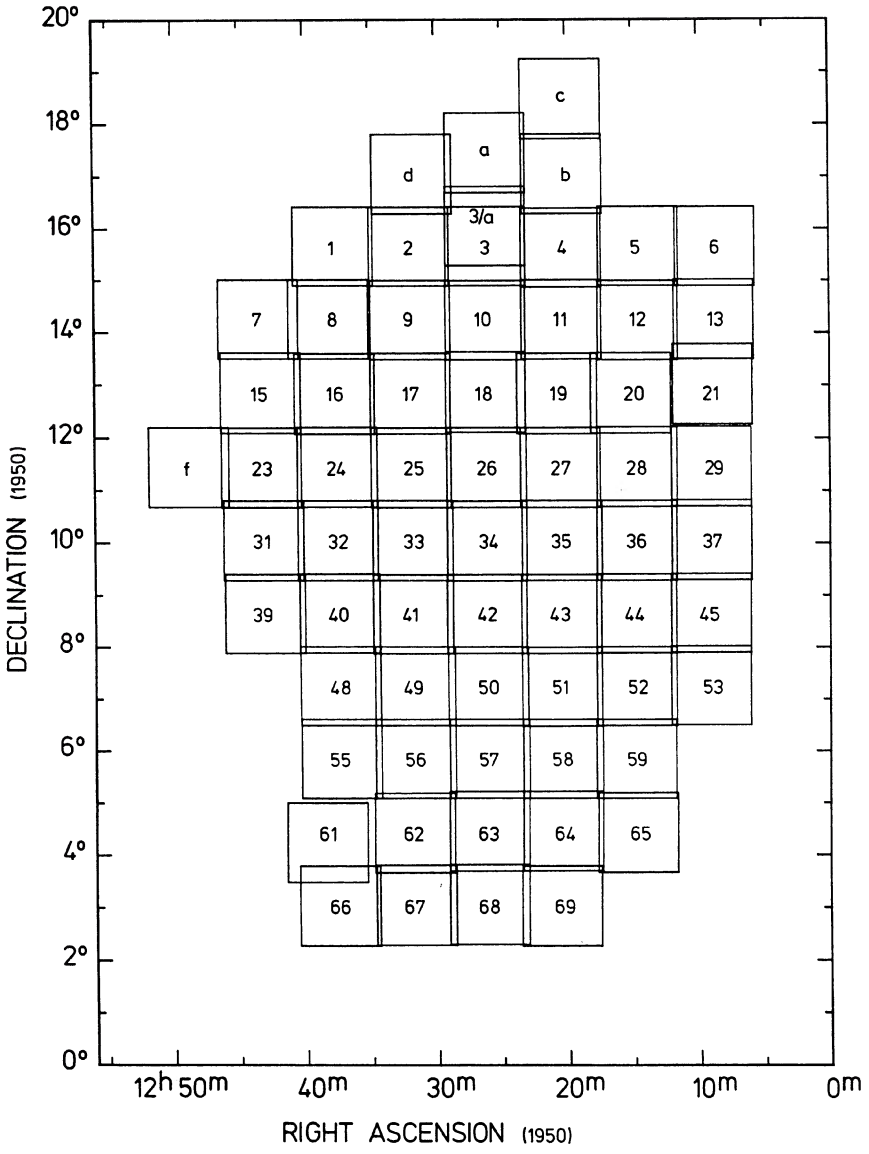

FIG. 1. Map of the Las Campanas survey fields.

galaxies, and for the apparently rare class of high-surface-brightness dwarfs (see Appendix C), where the morphological criteria (1)–(3) cannot be applied.

All four membership criteria have their characteristic shortcomings. Criterion (1) breaks down close to the turnover of the absolute magnitude-surface brightness relation at $B_T \sim 13$ (cf. Fig. 8 of Paper I). Criteria (2) and (3) are based on relations that are known to have large cosmic dispersions (see Sandage, Binggeli, and Tammann 1985a, Paper IV, and Sandage and Tammann 1981, respectively). Even the seemingly safe dynamical criterion (4) is spoiled in certain regions, defined below, by background galaxy groups that overlap in their velocity distributions with the Virgo cluster.

These uncertainties forced us to introduce a broad class of "possible cluster members".

2) Membership assignments

We distinguish between:

(A). Certain Virgo Cluster members. All available criteria unambiguously indicate membership. Above all, we find here the great number of dwarf members of the cluster which can be recognized beyond question on the basis of their unusually low surface brightness [criterion (1)]. 1277 certain Virgo members were identified in the survey area.

(B). Possible Virgo Cluster members. The combined membership criteria do not allow a clearcut decision between certain membership and background. Typical cases are: possible dwarf members of high surface brightness where criterion (1) fails and no velocity [criterion (4)] is yet available (see Appendix C); or galaxies in the so-called W cloud region where all membership criteria break down (as discussed below). 574 possible Virgo cluster members were identified.

(C). Background galaxies. We have identified and included in the survey all galaxies that are listed in the *Catalog of Galaxies and Clusters of Galaxies* (CGCG) of Zwicky *et al.* (1961–1963). There are 527 Zwicky galaxies in the survey area. 245 of them are clearly in the background. All other background galaxies are not discussed in the catalog.

TABLE I (a). The survey plates.

Virgo field	Plate	Plate center R.A. (1950)	Plate center Dec. (1950)	Exposure Date	Exposure Time	Virgo field	Plate	Plate center R.A. (1950)	Plate center Dec. (1950)	Exposure Date	Exposure Time
a	CD 2186	12^h26^m14	$17°26.'8$	1982 Mar 29	50^m	31	CD 2196	12^h43^m15	$10°02.'4$	1982 Mar 30	50^m
b	CD 2194	12 20.34	17 02.6	1982 Mar 30	50	32	CD 1319	12 37.50	10 02.5	1980 Mar 13	75
c	CD 2202	12 20.39	18 28.5	1982 Mar 31	50	33	CD 1352	12 31.81	10 02.6	1980 Mar 16	75
d	CD 2210	12 31.75	17 02.5	1982 Apr 1	50	34	CD 717-S	12 26.16	10 02.2	1979 Feb 1	45
f	CD 2211	12 48.83	11 26.2	1982 Apr 1	50	35	CD 1351	12 20.44	10 02.7	1980 Mar 16	75
1	CD 2119	12 37.78	15 39.3	1982 Mar 20	50	36	CD 1362	12 14.74	10 02.7	1980 Mar 17	75
2	CD 2130	12 32.00	15 39.0	1982 Mar 21	50	37	CD 2129	12 09.04	10 03.4	1982 Mar 21	50
3	CD 2146	12 26.17	15 39.3	1982 Mar 23	50	39	CD 2205	12 43.05	8 38.5	1982 Mar 31	50
3/a	CD 2175	12 26.17	16 02.6	1982 Mar 28	50	40	CD 2147	12 37.38	8 38.9	1982 Mar 23	50
4	CD 783-S	12 20.42	15 37.6	1979 Feb 23	45	41	CD 801-S	12 31.80	8 38.0	1979 Feb 25	45
5	CD 2145	12 14.56	15 39.2	1982 Mar 23	50	42	CD 716-S	12 26.19	8 38.3	1979 Feb 1	45
6	CD 2137	12 08.72	15 39.0	1982 Mar 22	50	43	CD 732-S	12 20.51	8.38.1	1979 Feb 3	45
7	CD 2138	12 43.50	14 15.0	1982 Mar 22	50	44	CD 1410	12 14.79	8.38.8	1980 Mar 24	75
8	CD 2155	12 38.16	14 15.0	1982 Mar 25	50	45	CD 2153	12 09.11	8.39.3	1982 Mar 25	50
9	CD 756-S	12 31.93	14 14.1	1979 Feb 5	50	48	CD 2131	12 37.34	7 14.9	1982 Mar 21	50
10	CD 724-S	12 26.21	14 13.9	1979 Feb 2	60	49	CD 2111	12 31.68	7 14.8	1982 Mar 19	50
11	CD 1399	12 20.43	14 14.7	1980 Mar 23	75	50	CD 1477	12 26.12	7 14.7	1980 Mar 11	75
12	CD 793-S	12 14.62	14 13.8	1979 Feb 24	55	51	CD 792-S	12 20.49	7 14.0	1979 Feb 24	55
13	CD 2118	12 08.84	14 15.1	1982 Mar 20	50	52	CD 1416	12 14.79	7 14.5	1980 Mar 25	75
15	CD 2176	12 43.34	12 50.9	1982 Mar 28	50	53	CD 2154	12 09.13	7 15.4	1982 Mar 25	50
16	CD 818-S	12 37.72	12 49.8	1979 Feb 26	45	55	CD 2187	12 37.31	5 50.9	1982 Mar 29	50
17	CD 755-S	12 31.95	12 50.1	1979 Feb 5	60	56	CD 2195	12 31.68	5 50.8	1982 Mar 30	50
18	CD 743-S	12 26.22	12 51.9	1979 Feb 4	60	57	CD 2158	12 26.05	5 50.9	1982 Mar 26	50
19	CD 723-S	12 20.78	12 50.1	1979 Feb 2	45	58	CD 1329	12 20.45	5 50.7	1980 Mar 14	75
20	CD 1328	12 15.17	12 50.8	1980 Mar 14	75	59	CD 1339	12 14.86	5 50.5	1980 Mar 15	75
21	CD 2110	12 08.94	13 01.1	1982 Mar 19	60	61	CD 2166	12 38.42	4 14.5	1982 Mar 27	50
23	CD 802-S	12 43.31	11 25.7	1979 Feb 25	45	62	CD 2204	12 31.78	4 25.4	1982 Mar 31	50
24	CD 1340	12 37.54	11 26.4	1980 Mar 15	75	63	CD 2164	12 26.09	4 27.3	1982 Mar 27	50
25	CD 733-S	12 31.92	11 25.7	1979 Feb 3	45	64	CD 2136	12 20.46	4 27.4	1982 Mar 22	50
26	CD 710-S	12 26.17	11 26.0	1979 Jan 31	50	65	CD 2157	12 14.74	4 25.7	1982 Mar 26	50
27	CD 1318	12 20.54	11 25.9	1980 Mar 13	75	66	CD 2185	12 37.47	3 01.9	1982 Mar 29	50
28	CD 1390	12 14.70	11 26.8	1980 Mar 22	75	67	CD 2139	12 31.67	3 02.8	1982 Mar 22	50
29	CD 2100	12 09.05	11 27.4	1982 Mar 18	75	68	CD 2174	12 26.09	3 03.5	1982 Mar 28	50
						69	CD 2193	12 20.56	3 01.8	1982 Mar 30	50

(D). Foreground galaxies. The number of foreground galaxies is *expected* to be small. It has been claimed many times that some of the blueshifted galaxies in the Virgo cluster area are actually in the foreground, notably the large spirals NGC 4192 and 4569 (see Tully and Shaya 1984, and references therein). However, excluding the Local Group, all blueshifted galaxies known to date lie in the direction to the Virgo cluster, i.e., in an area that is extremely small compared to the whole sky. It therefore appears that, of all galaxies in that area, just the blueshifted ones are the most certain members of the Virgo cluster (Sandage and Tammann 1976). We have identified no clear case of a foreground galaxy.

In summary, we have identified on the 67 du Pont plates:

1277 certain Virgo cluster members,
574 possible Virgo cluster members,
245 background (Zwicky) galaxies,
0 foreground galaxies,

2096 in total.

Figure 2 shows the distribution of these 2096 galaxies in the survey area. This is the total catalog presented in Sec. III.

3) Difficult regions

Three particular regions at the outskirts of the cluster posed special problems with regard to membership assignments:

(a). W cloud. This is a large, prolonged structure of ~ 100 galaxies, stretching from $\alpha \sim 12^h25^m$, $\delta \sim 8°$ down to $\alpha \sim 12^h15^m$, $\delta \sim 5°.5$ (see Fig. 2). The cloud was first isolated by de Vaucouleurs (1961). Judging from its mean velocity of ~ 2000 km s^{-1}, it is at about twice the distance of the Virgo cluster. Such proximity is spoiling all Virgo membership criteria, except for the most extreme cases. The distance between the cloud and the cluster corresponds to a difference of only 1.5 mag. This is not enough, in most cases, to cause a decisive difference in surface brightness, resolution into knots, or luminosity class [criteria (1)–(3)] at a given apparent magnitude. The velocity criterion (4) also breaks down because the velocity distributions of the W cloud and the Virgo cluster overlap. The area of possible contamination by the W cloud is defined in Figs. 1 and 2 of Sandage, Binggeli, and Tammann (1985b; Paper V). In that large area, we have identified only about 30 certain Virgo members by their extremely low surface brightness or very low velocity ($v < 500$ km s^{-1}). All remaining galaxies we have included as "possible Virgo members", although there is no doubt that most of them belong to the W cloud—but their identification is still impossible (see Fig. 2 of Paper V).

(b). M cloud. This is a much smaller galaxy group in the NW at $\alpha \sim 12^h10^m$ and $\delta \sim 13°$ (cf. again Figs. 1 and 2 of Paper V). The cloud was isolated dynamically by Ftaclas, Fanelli, and Struble (1984), but it was known long before to Shapley and Ames (1929), who named the region "b". Like

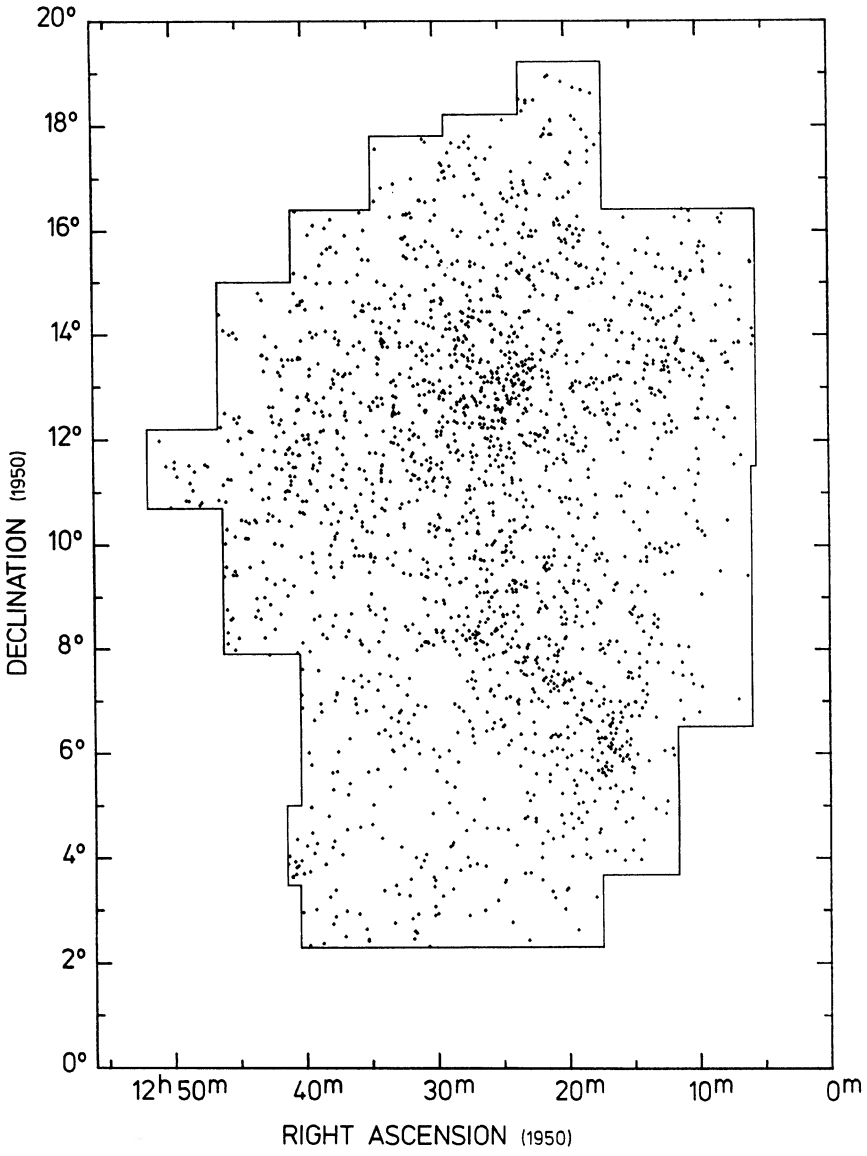

FIG. 2. Distribution of all 2096 catalog galaxies in the survey area.

the W cloud, the M cloud is at about twice the Virgo distance, and the difficulties of membership assignment are the same.

(c). Southern Extension ($\delta < 5°$). This is a huge prolate structure of the Virgo Supercluster complex pointing toward the Virgo cluster (see Fig. 2 of Yahil, Sandage, and Tammann 1980). In the sky it appears as a "southern extension" of the Virgo cluster (see de Vaucouleurs 1961). Only the most northern tip of this structure falls into our survey area. Inspecting the region on the du Pont plates, we have drawn a borderline at $\delta = 5°$. Galaxies with $\delta < 5°$ (= Southern Extension) cannot be assigned cluster membership with any certainty. It is doubtful whether here are any appreciable numbers of genuine cluster members, or whether most galaxies belong to the surrounding Virgo cluster complex. In the Southern Extension, we have distinguished therefore only between possible members and background galaxies.

For statistical investigations on the Virgo cluster members, one should exclude these problematic regions, as was done, for instance, in Paper V for the derivation of luminosity functions.

4) Reliability of morphological membership criteria

For no galaxies have we found any contradictions between the morphological membership criteria (1)–(3). Very rarely, our morphological membership assignments were contradicted by the velocity, in which case the evidence from the velocities was given priority. The morphological membership criteria were put on a test when new velocity data became available for 210 galaxies, the membership status of which had been determined before on purely morphological grounds. The result of this test is shown in Table I(b). Members were predicted by morphology with a success rate of 98%, background galaxies with one of 95%. The latter figure is only a lower limit because all of the many non-Zwicky galaxies, assigned originally to the background (without knowledge of their redshifts) and not included in the present catalog, were confirmed as background objects

TABLE I (b). Test of the reliability of morphological membership criteria from new velocity data for 210 galaxies.

Morphological prediction	N	Confirmed	Contradicted
		by velocity	
Members	65	64 (98.5%)	1
Background	79	75 (95%)	4
No prediction (poss. members)	66 (31%)	41 (62%) Members 14 (21%) Background 11 (17%) Poss. mem.	
Total	210	by velocity	

whenever a redshift became available for them. For the 66 possible members by morphology, the velocity data were used to make a final decision between Virgo membership and background. This was impossible in 11 cases, all of which are in the problematic regions (see above) where the velocity fails, too, as membership criterion.

We conclude from this that the present catalog rests essentially on a *morphological* selection, and that radial velocities serve in general only as a confirmation of membership assignments. Membership assignments of *faint* dwarf galaxies rest entirely on morphology because redshift data are not available for them, but—in spite of this—they are particularly certain cluster members.

c) Completeness Limits

The catalog is bound to be incomplete at the faintest levels with respect to members and possible members of the Virgo cluster. In general, the limit of completeness depends on the galaxian type. The members are recognized as certain *types*; membership assignment and classification go hand in hand. At faint magnitudes, only two main groups of galaxies remain, which we consider separately: low-surface-brightness dwarfs (dE and Im), and high-surface-brightness dwarfs (low-luminosity E galaxies and blue compact dwarfs).

1) Low-surface-brightness objects

For dE galaxies, we can determine well where the limit approximately lies from the photometry in Paper I. The limit is defined by *surface* brightness, not *total* magnitude. This can be seen in Fig. 8 of Paper I, where the surface brightness-absolute magnitude relation for dE's is shown. There is a relatively well defined lower boundary for $\langle SB\rangle_e$, the mean surface brightness within the effective aperture, at $\sim 25.3\,B$/(arcsec)^2, faintward of which the dwarfs (which we assume do exist) can probably no longer be distinguished from the sky background and are lost in the night. Assuming a constant width of the surface brightness-absolute magnitude relation, one starts to lose the first dE's with $B_T \gtrsim 18$ and with mean surface brightness fainter than $25.3\,B$/(arcsec)^2. This incompleteness increases linearly as one goes faintward, until at $B_T \sim 20$,—which is the limit of *total* magnitude for dE's, the value of $25.3\,B$/(arcsec)^2 becomes the *highest* possible surface brightness. Beyond $B_T = 20$, all dwarfs are presumably fainter than $25.3\,B$/(arcsec)^2 and remain undetected. This would imply a completeness limit of $B_T \sim 18$ for dE galaxies.

This limit is conservative, however, since the photometric study of Paper I is based on the du Pont plates only. We have made a special effort to find dwarfs of extremely low surface brightness by scanning the IIIaJ Schmidt plates independently for this sole purpose. The long-exposure Schmidt plates, with a stellar limiting magnitude of $B_{\rm lim} \sim 23$, are clearly somewhat deeper than the larger-scale du Pont plates, and they are especially suited for detecting low-surface-brightness features. About 50 faint dwarf members were added in this way which had not been detected (though confirmed afterwards) on the duPont plates. Their effective mean surface brightness is likely to be a few tenths of a magnitude fainter than $25.3\,B$/(arcsec)^2. This suggests, based again on Fig. 8 of Paper I and assuming that Im dwarfs follow a similar relation, a *completeness limit of* $B_T \sim 18.5$ *for* dE *and* Im *galaxies*, provided the very-large-size dwarfs (see Appendix C and Paper III) do not reside in great numbers at a surface-brightness level below the detection limit, which we estimate realistically as $\langle SB\rangle_{\rm lim} \sim 25.5\,B$/(arcsec)^2.

2) High-surface-brightness objects

In principle, the high-surface-brightness dwarf members of the Virgo cluster could, if existing, be detected almost down to the stellar limiting magnitude of $B_{\rm lim} \sim 22$ (for du Pont plates). The problem is, they cannot be *recognized* as such. Two dwarf types of high surface brightness have been isolated in the Virgo cluster by velocity data: the low-luminosity (M32-type) E galaxies, and the blue compact dwarfs (BCD), illustrated in Paper III. The radial velocity is the only safe membership criterion for them. However, the dwarfs are sufficiently distinct in their morphological appearance as to allow a search for candidates, i.e., *possible* Virgo members, down to $B_T \sim 18$. We have executed such a search and came up with the candidates listed in Appendix C. New velocity data will decide between true members and background objects. Thus, *the completeness limit for possible dwarf members of high surface brightness is at* $B_T \sim 18$. We believe that there are only a few high-surface-brightness dwarf members fainter than $B_T = 18$. The final proof, though, would depend on a catalog of thousands of faint images and subsequent spectroscopy,—a prohibitive task at present. Note also that semantic difficulties would arise at the faintest levels; for instance, the brightest globular clusters of M87 have $B_T \sim 19$ (Strom *et al.* 1981). How isolated must a globular cluster be in order to be counted as a galaxy?

3) Global limits

The survey embraces all members and possible members of the Virgo cluster in the area covered with $B_T \leqslant 18$, *independent of the galaxy type.* This limit corresponds to an absolute magnitude of $M_{B_T} = -13.7$, assuming a Virgo distance modulus of $(m\text{-}M) = 31.7$. Fainter than $B_T = 18$, only dE and Im dwarfs with a surface brightness of $\langle SB\rangle \lesssim 25.5\,B$/(arcsec)^2 are included. The faintest objects have $B_T \sim 20$, or $M_{B_T} \sim -11.7$.

III. THE CATALOG

The catalog is presented in Table II(a). It contains all galaxies detected in the survey area that are considered members or possible members of the Virgo cluster. In addition, it contains all galaxies, even if lying clearly in the background, from the CGCG of Zwicky *et al.* (1961–1963). This amounts to a total of 2096 galaxies. The catalog is composed of 11 columns; each galaxy occupies two lines. The data listed are as follows:

TABLE II (a). Catalog of 2096 galaxies in the Virgo cluster area.

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1		12 05.78	B	$S0_1(9)$	14.78	0.89	0.63			
Z		13 57.7			2					
2	$14^\circ 8$	12 05.87	M	dE2:	18.5	0.54	0.10			
		14 06.4			4					
3		12 05.89	-	BCD?	17.5	0.43	0.40			
		13 48.0			4					
4	$15^\circ 6$	12 05.96	M	ImIV	17.5	0.80	0.07	588	10	
		15 22.5			4			10		
5	$15^\circ 7$	12 06.00	M	dE4	18.9	0.70	0.19			
		15 24.0			4					
6		12 06.30	B	SBa	15.1	0.91	0.11			
Z		9 24.5			7					
7	IC 3016	12 06.76	B	SBc(s)I	15.04	0.95	0.00			
Z		11 42.5			2					
8		12 06.80	M	dE	19.0	0.54				
		13 48.2			4					
9	IC 3019	12 06.82	M	dE1,N	13.93	1.21	0.00			
Z	$14^\circ 9$	14 16.2			1	1.32	0.10			
10	IC 3017	12 06.86	-	BCD:	14.75	0.91	0.65	1944	12	
Z		13 51.1			2			36		
11	$7^\circ 5$	12 07.04	M	dE6	17.0:	1.10	0.40			
		7 01.3			4					
12		12 07.18	B	SBa(s)	15.3	0.95	0.30			
Z		12 24.1			7					
13	$13^\circ 7$	12 07.22	-	?	18.6	0.76	0.22			
		13 49.7			4					
14		12 07.30	-	BCD?	16.5	0.33	0.30			
		11 32.1			4					
15	IC 3021	12 07.36	-	Sa?	14.7	1.08	0.22	2518	91	
Z	$13^\circ 8$	13 19.7			6	1.26	0.23	18		
16	$14^\circ 11$	12 07.47	-	ImIII?	16.5	0.76	0.20			
		14 53.6			4					
17	$14^\circ 10$	12 07.48	M	ImIV	15.2	1.16	0.30	820	10	
	UGC 7150	14 38.4			4			10		
18	IC 3024	12 07.65	-	Sc(s)II	15.00	1.10	0.45	2300	12	
Z	UGC 7161	12 36.1			1	1.10	0.48	100		
19		12 07.68	-	BCD?	16.5	0.51	0.18			
		13 28.0			4					
20		12 07.76	-	?	18.0	0.56	0.10			
		12 36.5			4					
21	IC 3025	12 07.83	M	dS0(4)	14.75	1.00	0.31	506:	12	
Z		10 28.0			2			(35)		
22		12 07.85	-	BCD?	16.0	0.26	0.10			
		13 26.9			4					
23		12 07.87	-	dE?	18.5	0.54				
		13 38.6			4					
24		12 08.05	M	BCD	14.95	0.89	0.43	1281	12	
Z		12 02.3			2			32		
25	NGC 4152	12 08.08	-	Sc(r)I.4	12.46	1.50	0.17	2167	31	
SA	UGC 7169	16 18.7			1	1.37	0.09	4		
26		12 08.12	-	Im?	17.5	0.73	0.18			
		14 55.5			4					
27	IC 3029	12 08.15	B	SBc(s)I	14.75	1.23	0.50	6825	91	*
Z	UGC 7171	13 36.5			1	1.19	0.57	17		
28		12 08.21	B	SBc	15.38	0.91	0.18			
Z		16 08.7			2					
29		12 08.27	M	dE3,N	17.4	0.68	0.15			
		15 32.0			4					
30	$16^\circ 4$	12 08.36	-	?	17.2	0.86	0.30			
		16 13.6			4					
31		12 08.39	-	?	14.87	0.65	0.32	2215	12	
Z		9 29.8			2			40		
32	IC 767	12 08.50	-	E4	14.3	0.95	0.22	1894	12	
Z		12 22.8			7			23		
33	IC 3032	12 08.58	M	d:E2,N:	14.67	0.73	0.08	1093	12	
Z		14 33.1			2			52		
34	IC 3033	12 08.62	M	Sc:	14.65	1.16	0.30	261	92	
Z	UGC 7181	13 51.9			1	1.10	0.16	10		
35		12 08.78	-	?	19.0:	0.43	0.18			
		12 11.3			4					
36		12 08.92	M	dE0:	19.0	0.45	0.00			
		13 51.7			4					
37	$13^\circ 9$	12 09.22	-	dE5,N	18.3	0.63	0.30			
		13 18.1			4					
38	IC 768	12 09.24	B	Sc(s)II-III	14.28	1.23	0.32	4021	91	
Z	UGC 7192	12 25.1			1	1.22	0.27	16		
39	UGC 7196	12 09.44	B	Sbc (on edge)	14.7	1.18	0.63	7095	12	
Z		15 40.9			6	1.16	0.60	33		
40		12 09.50	B	Sbc(s)	15.38	0.97	0.17			
Z		15 11.1			2					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
41	13°10	12 09.52	-	IBm?	18.0	0.88	0.40			
		13 01.1			4					
42		12 09.54	M	dE	19.5	0.73				
		15 13.9			4					
43	NGC 4164	12 09.55	-	E3	15.3	0.73	0.18			
Z		13 29.0			7					
44		12 09.56	M	dE5	19.0	0.76	0.30			
		10 10.5			4					
45		12 09.57	-	BCD?	16.0	0.30	0.00			
		15 23.4			4					
46	13°11	12 09.64	-	dE3?	17.0	0.63	0.15			
		13 10.3			4					
47	NGC 4165	12 09.65	B	Sa(r)	14.20	1.10	0.27	1849	93	*
Z	UGC 7201	13 31.5			1	1.18	0.14	17		
48	12°9	12 09.70	M	Sd(s)/SmIII	14.3	1.33	0.12	-53	12	
Z	UGC 7200	12 45.9			6	1.26	0.07	37		
49	NGC 4168	12 09.74	-	E2	12.21	1.26	0.10	2316	34	
SA	UGC 7203	13 29.0			1	1.45	0.04	20		
50	15°8	12 09.77	M	dE2,N	16.6	0.86	0.12			
		15 45.8			4					
51	IC 3037	12 09.78	B	Sb	15.1	0.73	0.08	9642	12	
Z		10 15.8			7			42		
52	7°6	12 09.82	-	Im?	17.8	0.43	0.00			
		7 15.6			4					
53		12 09.82	B	Sa:	15.2	0.86	0.20			
Z		9 03.2			7					
54		12 09.87	B	$S0_1(8)$	15.3	0.77	0.52	7244	12	
Z		15 40.5			7			37		
55		12 09.90	M	dE1	18.7	0.57	0.05			
		13 33.5			4					
56	UGC 7210	12 09.97	B	Sb (on edge)	15.1	1.02	0.56	7137	12	
Z		15 33.0			6	1.03	0.47	34		
57	IC 3038	12 09.99	B	SbI	15.13	1.03	0.18			
Z		11 37.8			2					
58	IC 769	12 09.99	-	SBb(r)I-II	13.17	1.50	0.16	2213	35	
Z	UGC 7209	12 24.0			1	1.40	0.15	4		
59	IC 3039	12 09.99	B	Sc	14.9	1.10	0.45	7001	12	
Z		12 35.2			7			41		
60	IC 3040	12 10.02	M	SmIII-IV	15.04	1.00	0.09			
Z	11°6	11 21.2			2					
61	6°7	12 10.05	-	dE0?	17.7	0.51	0.00			
		6 46.8			4					
62		12 10.08	B	S0	15.2	0.80	0.46			
Z		10 18.5			7					
63		12 10.13	-	dE5?	19.3	0.49	0.30			
		10 26.6			4					
64		12 10.14	B	Sab	15.04	0.80	0.31			
Z		11 49.9			2					
65		12 10.17	-	dE?	18.0	0.34				
		12 24.0			4					
66	NGC 4178	12 10.23	M	SBc(s)II	11.89	1.82	0.45	355	20	
SA	UGC 7215	11 08.8			1	1.70	0.40	12		
67	IC 3044	12 10.26	M	Sc(s) pec	13.98	1.45	0.45	-182	91	
Z	UGC 7216	14 15.3			1	1.33	0.34	19		
68	13°12	12 10.27	-	dE3:,N	17.0	0.57	0.15			
		13 37.5			4					
69		12 10.37	M	dE0,N:	18.5	0.51	0.00			
		10 50.3			4					
70		12 10.39	-	dE?	18.0	0.43				
		13 20.8			4					
71	14°12	12 10.43	-	?	18.0	0.86	0.43			
		14 23.2			4					
72	15°9	12 10.48	M	ImIII/BCD	16.0	0.60	0.10	90	12	
		15 12.7			4			20		
73	NGC 4180	12 10.50	-	Sb:	13.35	1.33	0.43	2120	11	
Z	UGC 7219	7 19.1			1	1.26	0.39	13		
74		12 10.53	-	BCD?	16.3	1.03	0.70			
		16 10.4			4					
75		12 10.58	B	S0	15.21	0.77	0.12	7893	12	
Z		16 22.0			2			40		
76	IC 3046	12 10.60	B	Sc(s)I	15.27	1.21	0.65	8112	91	*
Z	UGC 7220	13 11.8			1	1.10	0.61	16		
77	7°7	12 10.63	-	dE6?	18.2	0.65	0.40			
		7 30.0			4					
78		12 10.74	-	Im?	18.0	0.43	0.27			
		11 25.1			4					
79	15°10	12 10.79	-	Im?	17.2	0.86	0.30			
		15 05.0			4					
80		12 10.84	-	dE3?	20.0	0.43	0.18			
		8 01.7			4					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A. (1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
81	NGC 4186	12 10.89	M	d:Sc	15.6	1.26	0.07	2077	94	
	15°11	15 03.0			4			10		
82	10°6	12 10.98	M	dEl	17.0	0.63	0.05			
		10 35.3			4					
83	IC 3049	12 11.01	M	ImIII-IV	15.13	1.03	0.27	2438	95	*
Z	14°13	14 45.5			2			10		
84		12 11.04	-	dE	18.5	0.40				
		13 40.9			4					
85		12 11.06	-	?	17.5	0.56	0.22			
		13 18.7			4					
86	UGC 7230	12 11.10	B	Sc+Sc	14.43	1.21	0.18	7133	32	*
Z		16 24.1			1	1.23	0.31	10		
87		12 11.13	M	SmIII	15.0	1.26	0.30	-129	12	
Z		15 43.9			7			10		
88		12 11.19	-	dE0?,N	18.2	0.49	0.00			
		13 40.4			4					
89	NGC 4189	12 11.24	-	SBc(sr)II.2	12.53	1.45	0.14	2115	37	
SA	UGC 7235	13 42.2			1	1.39	0.06	2		
90		12 11.24	M	dE	18.5:	0.73				
		15 06.9			4					
91	6°8	12 11.25	M	dE0:	18.0:	0.56	0.00			
		6 38.4			4					
92	NGC 4192	12 11.26	M	SbII:	10.92	2.08	0.57	-131	34	
SA	M 98	15 10.8			1	1.98	0.48	12		
93	12°10	12 11.27	-	dE2	16.3	0.73	0.18			
		12 58.0			4					
94	NGC 4191	12 11.30	-	S0/a	13.57	1.21	0.18	2634	11	
Z	UGC 7233	7 28.8			1	1.17	0.12	33		
95	IC 3053	12 11.32	B	Sb(r)I	15.13	1.03	0.30	15342:	12	
Z		14 30.0			2			(50)		
96	7°8	12 11.34	-	dEl	17.5	0.60	0.04			
		7 44.1			4					
97	NGC 4193	12 11.35	-	Sc(s)II	13.20	1.37	0.30	2466	38	
Z	UGC 7234	13 27.0			1	1.36	0.27	6		
98	14°14	12 11.35	M	ImV:	18.5:	0.71:				
		14 08.9			4					
99		12 11.49	-	Sa?	14.81	1.10	0.54			
Z		7 00.1			2					
100	13°15	12 11.52	M	dE2	18.5	0.59	0.10			
		13 55.8			4					
101	NGC 4192B	12 11.56	B	Sa(r)	14.42	1.05	0.11	7863	91	*
Z	UGC 7240	15 00.3			1	1.15	0.11	16		
102		12 11.58	-	BCD	15.04	0.65	0.22			*
Z		13 51.9		or merger	2					
103		12 11.58	B	Sb	14.78	0.95	0.22	15215	12	*
Z		14 26.1			2			36		
104	10°7	12 11.59	M	dE3	18.0:	0.95	0.15			
		10 00.0		or ImV	4					
105	8°5	12 11.60	M	SBdIV	13.68	1.49	0.08	1220	39	
Z	UGC 7239	8 03.2			1	1.40	0.03	8		
106	12°11	12 11.6	M	dE3	18.0	0.57	0.15			*
		12 13			4					
107	13°14	12 11.63	M	dE	20.0	0.43:				
		13 30.8			4					
108	16°7	12 11.65	M	dE2:	17.0	1.02	0.10			
		16 14.7			4					
109	13°16	12 11.69	M	dE3,N	16.4	0.84	0.13			
		13 49.3			4					
110		12 11.81	M	dE2:	18.3	0.56	0.10			
		15 15.4			4					
111		12 11.84	M	dE:	19.5	0.46				
		11 04.4			4					
112		12 11.94	-	dE?	19.5	0.29				
		14 21.3			4					
113	12°13	12 12.0	-	?	17.0	0.73	0.18			*
		12 21			4					
114		12 12.02	-	Im?	16.0	0.91	0.35			
		5 57.3			4					
115	12°12	12 12.03	M	dE5	16.7	1.03	0.30			
		12 08.4			4					
116		12 12.04	-	BCD?	17.2	0.03	0.00			
		7 32.0			4					
117		12 12.04	-	Im?	16.5	0.91	0.26			
		9 28.6			4					
118	9°2	12 12.07	M	dE3	15.6	0.82	0.15			
		9 58.0			4					
119	13°17	12 12.08	M	Sc	14.76	1.33	0.48	625	40	
Z	DDO 114	13 05.4			1	1.19	0.40	8		
120	NGC 4197	12 12.09	M	Scd (on edge)	13.47	1.65	0.74	2064	9	
Z	UGC 7247	6 05.2			1	1.55	0.73	4		

TABLE II (a). (continued)

VCC Cat. / Name 1 / Name 2	R.A.(1950) / Dec. (1950)	VC memb.	Hubble type	B_T / Source	$\log D_{est}$ / $\log D_{25}$	$\log R_{est}$ / $\log R_{25}$	$v_\odot$ / ϵ	Source	Note
(1) (2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
121	12 12.15	B	E7/S0$_1$(7)	16.0:	0.91	0.48			*
Z	13 16.2			4					
122 NGC 4200	12 12.18	-	S0$_1$(4)	13.85	1.33	0.30	2376	11	
Z UGC 7251	12 27.5			1	1.25	0.26	28		
123	12 12.20	B	Sa	15.2	0.86	0.12			
Z	13 36.1			7					
124 13°18	12 12.24	-	SmIV:	16.0	0.95	0.00			
	13 21.9			4					
125 13°19	12 12.37	-	?	18.2:	0.86	0.37			
	13 28.9			4					
126 IC 3059	12 12.38	M	SBd	14.23	1.37	0.21	262	10	
Z 13°21	13 44.2			1	1.24	0.07	10		
127 12°14	12 12.41	M	dE0	17.5	0.81	0.01			
	12 08.3			4					
128 9°3	12 12.46	M	dE0	15.6	0.86	0.00			
	9 50.6			4					
129 IC 3060	12 12.5	B	Sab	14.64	1.10	0.24	5808	12	*
Z	12 48			2			33		
130	12 12.52	-	BCD?	16.5	0.65	0.40			
	10 01.9			4					
131 IC 3061	12 12.53	-	Sc	14.34	1.51	0.95	2324	96	
Z UGC 7255	14 18.4			1	1.36	0.61	17		
132 13°20	12 12.54	M	SBd	16.4	1.23	0.13			
	13 18.7			4					
133	12 12.54	M	dE	19.5	0.43				
	13 23.4			4					
134 IC 3062	12 12.54	B	ScI	14.5	1.03	0.12	7869	12	
Z	13 52.3			7			35		
135 IC 3063	12 12.55	M	S pec/BCD	14.81	1.16	0.30	2378	12	
Z UGC 7259	12 17.7			1	1.03	0.27	31		
136	12 12.56	-	?	18.5	0.51				
	5 04.5			4					
137 15°12	12 12.60	-	?	17.4	0.64	0.15			
	15 15.0			4					
138 9°4	12 12.64	M	ImIV-V	18.3	0.62	0.06			
	9 26.1			4					
139	12 12.66	-	dE?,N	19.3	0.43				
	11 16.7			4					
140 IC 3065	12 12.66	M	S0$_{1/2}$(4)	14.3	1.10	0.24	1072	12	
Z	14 42.8			7			46		
141	12 12.67	B	Sbc	14.9	0.95	0.36			
Z	4 50.6			7					
142 IC 771	12 12.67	B	SBc(s)II	14.56	1.10	0.07	5898	12	
Z	13 27.9			2			38		
143 IC 3066	12 12.72	M	Sc (on edge):	15.46	1.10	0.67	385	12	
Z UGC 7262	13 45.1			1	1.03	0.62	42		
144	12 12.74	M	BCD	15.31	0.65	0.28	1960	3	
	6 02.4			1	0.75	0.17	52		
145 NGC 4206	12 12.74	M	Sc(s)	12.77	1.80	0.77	702	41	
Z UGC 7260	13 18.2			1	1.72	0.63	2		
146	12 12.80	M	dE:	20.0	0.41				
	12 53.6			4					
147	12 12.89	M	dE,N	19.0	0.16				
	9 52.4			4					
148	12 12.90	-	BCD	15.3	0.56	0.12			
	15 31.4		or S	4					
149	12 12.91	-	dE?	19.5	0.16				
	8 04.8			4					
150	12 12.93	-	dE?	20.0	0.41				
	12 55.6			4					
151	12 12.94	M	dE:	19.5	0.29				
	14 14.8			4					
152 NGC 4207	12 12.97	M	Scd (on edge)	13.48	1.37	0.34	603	32	
Z UGC 7268	9 51.8			1	1.26	0.26	4		
153	12 13.00	M	dE	19.5	0.26				
	9 56.4			4					
154	12 13.02	-	E(0,3)	16.5	0.76	0.22			
	14 13.2		or S0	4					
155 IC 3073	12 13.04	M	dS0?	14.95	1.16	0.35			
Z 13°22	13 53.7			1	1.03	0.09			
156 12°15	12 13.05	M	dE?	19.5	0.54				
	12 01.3			4					
157 NGC 4212	12 13.11	M	Sc(s)II-III	11.86	1.65	0.25	-82	37	
SA UGC 7275	14 10.8			1	1.48	0.16	20		
158 15°13	12 13.12	M	dE3,N	15.8	1.03	0.18			
UGC 7269	15 17.0			4					
159	12 13.14	M	ImIII	15.08	0.95	0.30	2584	10	
Z	8 33.8			2			10		
160 7°9	12 13.16	-	dE	19.0	0.33				
	7 43.7			4					

TABLE II (a). (continued)

VCC Cat. Name 1 Name 2	R.A.(1950) Dec.(1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1) (2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
161 UGC 7273	12 13.18	B	Sbc(s)II	15.22	1.16	0.51	11223	12	
Z	8 24.7			1	1.03	0.47	43		
162 IC 3074	12 13.19	M	Sd (on edge)	14.41	1.56	0.76	1980	42	
Z UGC 7279	10 58.6			1	1.36	0.61	8		
163	12 13.22	M	dE	19.6	0.56				
	12 50.4			4					
164	12 13.33	-	dE:	20.0	0.33				
	12 18.5			4					
165	12 13.34	M	$S0_1(0,2)$:	14.87	1.02	0.16	255	12	
Z	13 29.7			2			43		
166 NGC 4215	12 13.36	-	$S0_2(9)$	13.12	1.43	0.57	2073	34	
SA UGC 7281	6 40.8			1	1.29	0.41	21		
167 NGC 4216	12 13.36	M	Sb(s)	10.97	2.05	0.62	121	34	
SA UGC 7284	13 25.6			1	1.92	0.58	9		
168 $14^\circ 15$	12 13.36	M	dE2	17.0	0.73	0.08			
	14 18.1		or ImIV	4					
169 $9^\circ 5$	12 13.39	M	ImV	16.5:	1.03	0.30			
	9 55.6			4					
170 IC 3077	12 13.40	M	dS0 pec:	14.86	1.16	0.20	1411	23	
Z $14^\circ 16$	14 42.6			1	1.16	0.27	20		
171 $8^\circ 7$	12 13.43	M	ImV	17.4	0.86	0.20			
	8 39.1			4					
172	12 13.46	-	BCD:	14.5	1.03	0.35	2167	14	
Z	4 55.7			7			10		
173 $8^\circ 6$	12 13.46	M	dS0(1)?	15.0	0.86	0.00	802	12	
Z	8 28.8			7			45		
174 IC 3078	12 13.46	B	Sb(r)I	14.69	0.80	0.00	23514:	12	
Z	12 57.9			2			(71)		
175	12 13.50	-	dE:	20.0	0.26				
	12 52.4			4					
176 IC 3080	12 13.50	B	SBa	14.87	0.95	0.10	7634	12	
Z	14 28.0			2			37		
177 IC 3079	12 13.52	B	SBa (smooth)	15.2	0.86	0.12	8077	12	
Z	11 48.7			7			52		
178 IC 3081	12 13.61	M	dE5,N	15.1	0.95	0.30			
Z	12 58.1			7					
179 $11^\circ 7$	12 13.65	M	dE3	18.3	0.73	0.18			
	11 38.3			4					
180	12 13.67	B	S0 pec	15.3	0.86	0.12			
Z	8 12.4			7					
181	12 13.69	-	dE7?,N?	17.3	0.80	0.46			
	13 51.8			4					
182 $15^\circ 15$	12 13.69	M	dE6	18.3	0.80	0.24			
	15 50.0			4					
183 $14^\circ 17$	12 13.72	-	dE?	18.5	0.34				
	14 31.1			4					
184 $10^\circ 8$	12 13.77	-	dE0?,N	16.2	0.65	0.00			
	10 01.5			4					
185	12 13.79	M	dE:	19.3	0.43				
	13 24.9			4					
186	12 13.81	B	Sa (on edge)	15.1	0.95	0.70	6280	12	
Z	11 05.0			7			32		
187 NGC 4222	12 13.83	M	Scd (on edge)	13.91	1.64	0.84	225	35	
Z UGC 7291	13 35.2			1	1.52	0.77	4		
188	12 13.83	-	dE?	19.0	0.34				
	14 32.0			4					
189	12 13.83	B	Sc(s)II	14.75	1.00	0.20	10752	12	
Z	15 32.4			2			35		
190 $8^\circ 8$	12 13.84	M	dE4	18.0:	0.82	0.22			
	8 04.6			4					
191	12 13.90	M	dE	18.7	0.38				
	10 37.5			4					
192	12 13.94	-	dE5	18.1	0.51	0.26			
	5 50.8			4					
193 IC 3091	12 13.94	B	S0 (tides)	14.39	1.43	0.30	7693	12	
Z	14 17.5			2			29		
194	12 13.95	B	S0	14.61	0.95	0.10	7857	12	
Z	14 46.6			2			32		
195	12 14.00	-	?	19.3	0.41				
	9 40.8			4					
196	12 14.00	-	BCD?	16.5	0.33	0.30			
	9 46.4			4					
197 $13^\circ 23$	12 14.00	M	dE	19.5	0.65				
	13 26.4			4					
198	12 14.01	-	ImIV?	18.0	0.73	0.18			
	7 06.8			4					
199 NGC 4224	12 14.01	-	Sa	12.95	1.56	0.46	2603	31	
SA UGC 7292	7 44.4			1	1.38	0.36	6		
200	12 14.02	M	dE2,N	14.69	1.03	0.08	65	12	
Z	13 18.6			2			43		

TABLE II (a). (continued)

VCC Cat. Name 1 Name 2	R.A. (1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1) (2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
201 $7^\circ 10$	12 14.04	-	?	18.0	0.56	0.52			
	7 19.2			4					
202	12 14.05	-	BCD?	16.0	0.40	0.30			
	9 57.4			4					
203	12 14.11	-	?	19.5	0.43:				
	9 06.3			4					
204	12 14.11	-	?	18.5	0.54				
	13 09.0			4					
205	12 14.16	-	dE?	19.3	0.38				
	6 58.1			4					
206 IC 3093	12 14.16	B	Sc	14.67	0.65	0.22	7056	12	
Z	14 33.3			2			38		
207	12 14.25	-	BCD?	17.2	0.40	0.45			
	8 19.7			4					
208 $7^\circ 11$	12 14.34	-	dE2:	17.8	0.56	0.12			
	7 11.4			4					
209 IC 3096	12 14.34	M	dS0?	14.63	1.33	0.60	1208	12	
Z	14 47.6			2			34		
210	12 14.38	B	Sc(s)II	14.78	0.73	0.18	11266	12	
Z	8 38.2			2			35		
211	12 14.39	-	dE2?,N?	17.5	0.65	0.10			
	4 20.1			4					
212	12 14.39	-	dE	19.5	0.34				
	6 51.9			4					
213 IC 3094	12 14.39	M	dS?/BCD?	14.44	0.86	0.12	-163	97	
Z UGC 7305	13 54.2			1	0.90	0.08	17		
214	12 14.41	-	dE3	18.2	0.58	0.15			
	5 08.1			4					
215	12 14.42	M	dE4	18.4	0.65	0.22			
	12 32.5			4					
216 IC 3097	12 14.47	M	dE5 pec,N	14.9	0.95	0.30	1325:	12	
Z	9 41.2			7			(79)		
217 $10^\circ 9$	12 14.53	M	ImIV-V:	15.5:	1.33	0.54	1185	95	
UGC 7307	10 17.0			4			10		
218 IC 3100	12 14.54	M	dS0(8),N:	14.88	1.43	0.57	533	43	
Z $12^\circ 16$	12 34.0			2			53		
219	12 14.58	-	?	19.5	0.18				
	7 37.8			4					
220 NGC 4233	12 14.58	-	$SB0_1(6)$ pec	12.97	1.53	0.50	2224	20	
SA UGC 7311	7 54.1			1	1.37	0.33	188		
221 NGC 4234	12 14.60	-	SBcIII.4	13.43	1.26	0.05	2017	44	
SA UGC 7309	3 57.6			1	1.11	0.02	15		
222 NGC 4235	12 14.61	-	Sa	12.62	1.73	0.78	2527	20	
SA UGC 7310	7 28.1			1	1.63	0.60	41		
223	12 14.62	-	BCD?	16.5	0.37	0.11			
	6 42.6			4					
224 IC 3099	12 14.62	M	Scd (on edge)	14.7	1.37	0.81	2133	23	
Z UGC 7313	12 43.9			7			20		
225	12 14.65	-	BCD?	17.0	0.16	0.30			
	8 36.2			4					
226 NGC 4237	12 14.65	M	Sc(r)II.8	12.53	1.40	0.24	867	37	
SA UGC 7315	15 36.1			1	1.36	0.16	4		
227 $9^\circ 6$	12 14.69	M	dE5,N	14.90	1.16	0.36	1290:	12	
Z UGC 7314	9 13.2			1	1.07	0.18	(91)		
228	12 14.74	B	Sb	14.87	0.95	0.22	4999	12	
Z	13 04.4			2			32		
229	12 14.77	M	dE	20.0	0.34				
	8 29.8			4					
230 IC 3101	12 14.78	M	dE4:,N:	15.2	0.95	0.22	1398	12	
Z	12 13.2			7			73		
231	12 14.80	-	dE4?	18.2	0.56	0.22			
	5 58.5			4					
232	12 14.85	M	dE	19.0:	0.58				
	13 47.0			4					
233 $13^\circ 24$	12 14.86	-	?	17.7	0.80	0.24			
	13 42.9			4					
234 NGC 4241	12 14.88	-	Sa	12.99	1.62	0.25	2235	11	
Z UGC 7319	6 58.1			1	1.39	0.25	25		
235 $14^\circ 18$	12 14.90	M	dE0:,N	16.7	0.86	0.00			
	14 00.9			4					
236 $8^\circ 9$	12 14.93	M	dE6	15.7	1.03	0.38			
	8 48.6			4					
237 $15^\circ 16$	12 14.94	-	?	18.0	0.73	0.18			
	15 09.8			4					
238	12 14.96	-	dE0,N	18.3	0.51	0.00			
	6 58.6			4					
239	12 14.97	M	dE:	20.0	0.10				
	10 26.1			4					
240 $14^\circ 19$	12 14.98	M	dE2,N	18.2	0.65	0.10			
	14 38.0			4					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
241	IC 3105	12 15.02	M	Sd (on edge)	14.60	1.51	0.48	-165	98	
Z	UGC 7326	12 40.0			1	1.26	0.50	10		
242		12 15.05	M	dE0	18.5	0.65	0.00			
		5 42.3			4					
243		12 15.07	-	dE?	20.0	0.18				
		8 45.7			4					
244		12 15.11	M	dE3	18.0	0.68	0.15			
		5 37.2			4					
245		12 15.11	M	dE3:	18.4	0.63	0.15			
		14 33.3			4					
246	$7^\circ 12$	12 15.13	-	?	19.0	0.26				
		7 25.7			4					
247	$8^\circ 10$	12 15.13	-	?	18.0	0.64				
		8 39.8			4					
248	$9^\circ 8$	12 15.14	-	ImIV-V?	17.2	0.80	0.15			
		9 05.7			4					
249		12 15.15	B	Sa	14.61	0.95	0.62			*
Z		13 39.5			2					
250		12 15.20	-	dE	19.5	0.25				
		6 42.5			4					
251	IC 3109	12 15.20	B	Sc(s)I	14.72	0.95	0.10			
Z		13 26.9			2					
252		12 15.21	-	dE4	17.3	0.73	0.25			
		5 43.6			4					
253		12 15.22	-	dE	19.0	0.46				
		4 08.4			4					
254		12 15.22	-	dE	20.0	0.26				
		6 42.1			4					
255		12 15.23	-	ImIV:	18.5	0.65	0.32			
		7 32.3			4					
256		12 15.24	B	S (on edge)	15.2	0.91	0.65			
Z		4 45.3			7					
257	IC 3107	12 15.24	B	Sbc(s)I-II	14.21	1.21	0.18	7292	97	
Z	UGC 7330	11 07.3			1	1.19	0.30	17		
258		12 15.30	M	dE	18.5:	0.56				
		6 16.1			4					
259	IC 3111	12 15.30	B	Sb(s)II	14.78	0.86	0.30	14793	12	
Z		8 42.5			2			34		
260		12 15.33	M	ImIV	15.7	0.91	0.05	1775	10	
		5 18.2			4			10		
261	$13^\circ 25$	12 15.34	M	dE2	16.0	0.95	0.10			
		13 27.3			4					
262		12 15.37	B	Sc(s)II	15.1	0.95	0.30			
Z		6 09.0			7					
263		12 15.40	-	dE2?	18.6	0.39	0.10			
		12 16.4			4					
264	NGC 4246	12 15.42	B	Sc(s)I-II	13.36	1.46	0.30	3724	11	
Z	UGC 7334	7 27.7			1	1.40	0.23	10		
265	NGC 4247	12 15.42	B	RSa pec	14.80	1.16	0.06	3944	4	
Z		7 32.9			1	0.83	0.07	82		
266	NGC 4249	12 15.43	B	$S0_1(0)$	14.6	0.86	0.00			
Z		5 52.6			7					
267	IC 3115	12 15.45	-	SBbc(s)I-II	13.82	1.40	0.00	2261	11	
Z	UGC 7333	6 55.8			1	1.23	0.09	23		
268		12 15.47	-	Im?	19.5	0.22				
		7 26.5			4					
269		12 15.54	B	Sc	15.54	1.10	0.61	6852	12	
Z		16 14.5			1	1.03	0.62	48		
270		12 15.56	B	$S0_3$	15.02	0.91	0.11			*
Z		5 57.8		or Sa	2					
271	IC 773	12 15.57	B	SBb(s)	14.4	1.00	0.14			
Z		6 25.2			6	1.26	0.28			
272		12 15.57	B	$S0_1(6)$	15.2	0.80	0.37			
Z		11 10.5			7					
273	$14^\circ 20$	12 15.62	M	dE3,N:	16.6	0.80	0.15			
		14 58.3			4					
274	$6^\circ 12$	12 15.63	-	BCD?	17.5	0.86	0.40			
		6 12.6			4					
275	IC 3118	12 15.64	M	dS0(6)	14.54	1.35	0.44			
Z	$9^\circ 9$	9 46.7			1	1.22	0.27			
276		12 15.65	-	?	18.4	0.49				
		5 55.9			4					
277	$7^\circ 13$	12 15.65	-	ImIII	15.1	1.10	0.37			
Z		7 56.2		or S pec	7					
278		12 15.69	-	dS0,Npec	15.1	0.73	0.00			
Z		6 52.9			7					
279	$10^\circ 10$	12 15.70	-	Sc?	16.3	0.80	0.00			
		10 37.9			4					
280	$11^\circ 8$	12 15.70	M	ImIV-V	17.7	0.56	0.00			
		11 45.5			4					

TABLE II (a). (continued)

VCC Cat. / Name 1 / Name 2	R.A.(1950) / Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ / $\log D_{25}$	$\log R_{est}$ / $\log R_{25}$	$v_\odot$ / ϵ	Source	Note
(1) (2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
281 IC 3120	12 15.71	M	dS0	15.3	0.95	0.00	203	15	
Z	14 01.6		or BCD	7			10		
282	12 15.75	-	dE5?	17.0	0.80	0.29			
	4 40.8			4					
283	12 15.83	-	dE?	18.8	0.53				
	3 56.9			4					
284	12 15.83	-	?	18.3	0.34	0.00			
	13 08.4			4					
285	12 15.90	-	dE?	19.5	0.34				
	10 55.7			4					
286	12 15.91	-	ImIII?	16.0	0.56	0.19			
	5 53.7			4					
287	12 15.92	-	dE4,N:	16.0	0.86	0.20			
	6 41.0			4					
288	12 15.94	-	dE4?,N	17.7	0.82	0.22			
	15 21.0			4					
289 NGC 4252	12 15.96	-	Sc (on edge)	14.81	1.33	0.68			
Z UGC 7343	5 50.3			1	1.17	0.54			
290	12 15.96	-	dE?	20.0	0.34				
	12 40.7			4					
291	12 15.97	-	dE?	18.8	0.25				
	5 15.4			4					
292 $6^\circ 14$	12 15.97	-	dE1,N	17.0	0.62	0.04			
	6 07.8			4					
293 $13^\circ 26$	12 16.00	M	dE5,N	16.6	0.86	0.30			
	13 28.2			4					
294 $6^\circ 13$	12 16.03	M	dE	18.0:	0.73:				
	6 46.4			4					
295 IC 3127	12 16.04	B	Sbc(s)I-II	15.13	0.80	0.00	8688	21	
Z	12 08.9			2			100		
296	12 16.07	-	dE	19.3	0.37				
	6 35.4			4					
297	12 16.09	B	Sc (on edge)	15.1	1.16	0.90			
Z	6 59.1			7					
298	12 16.09	B	$S0_1(8)/a$	15.13	1.00	0.56	7713	15	
Z	13 12.9			2			60		
299 $13^\circ 27$	12 16.12	M	dE3	17.2	0.80	0.18			
	13 52.5			4					
300	12 16.15	-	dE5	18.1	0.56	0.30			
	5 56.7			4					
301	12 16.15	-	dE0?,N?	18.5	0.56	0.00			
	7 44.5			4					
302 IC 3128	12 16.15	B	Sc (tides)	14.8	0.95	0.22	11680	12	*
Z	12 00.5			7			35		
303	12 16.16	-	dE2?,N:	15.8	0.60	0.09			
	6 04.1			4					
304 $12^\circ 17$	12 16.19	-	dE1 pec?	16.3	0.80	0.07			
	12 39.8			4					
305	12 16.24	-	dE?	20.0	0.34				
	10 55.5			4					
306	12 16.26	M	dE:	19.3	0.26				
	9 16.1			4					
307 NGC 4254	12 16.28	M	Sc(s)I.3	10.43	1.88	0.04	2413	20	
SA M 99	14 41.7			1	1.73	0.05	10		
308 IC 3131	12 16.30	M	$d:S0_1(0),N:$	14.30	1.16	0.00	1596	12	
Z $8^\circ 12$	8 08.3			2			39		
309 $12^\circ 18$	12 16.31	M	Im/BCD	16.2	0.91	0.11	1508	12	
	12 52.5			4			20		
310 $12^\circ 19$	12 16.35	M	dE2:	19.5	0.69	0.10			
	12 28.3			4					
311 IC 775	12 16.35	B	$E4/S0_1(4)$	14.5	1.26	0.22	7586	15	*
Z UGC 7350	13 11.5			4	1.14	0.13	76		
312 NGC 4255	12 16.39	-	$S0_1(6)$	13.61	1.26	0.40	1696	11	
Z UGC 7348	5 03.8			1	1.17	0.29	50		
313 IC 3134	12 16.39	B	Sa	14.62	1.03	0.38	4448	12	
Z	9 14.4			2			33		
314 IC 3136	12 16.40	-	Sc(s)II	14.86	1.16	0.46			
Z UGC 7349	6 28.0			1	1.06	0.51			
315	12 16.45	B	SBa(s)	14.98	0.95	0.22			
Z	6 22.6			2					
316	12 16.47	-	?	19.3	0.16				
	6 04.1			4					
317	12 16.50	M	dE2	18.0	0.68	0.10			
	5 22.5			4					
318 IC 776	12 16.50	M	SBcd(s)III	14.01	1.33	0.23	2467	46	
Z UGC 7352	9 08.1			1	1.33	0.25	8		
319 $14^\circ 21$	12 16.50	M	dE0,N	16.2	0.80	0.00			
	14 15.5			4					
320	12 16.54	-	S?	16.5:	0.95	0.00			
	4 56.2			4					

TABLE II (a). (continued)

VCC Cat. Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ε	Source	Note
(1) (2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
321	12 16.54	-	dE6	18.0	0.65	0.40			
	6 01.1			4					
322 IC 3142	12 16.55	M	Im:	15.1	1.03	0.38	-206	23	*
Z 14°22	14 15.3			4			20		
323 NGC 4257	12 16.56	-	Sa	14.91	1.16	0.60			
Z	6 00.3			1	1.08	0.49			
324 UGC 7354	12 16.61	-	BCD	14.78	1.07	0.07	1582	3	
Z Mark 49	4 08.0			1	0.81	0.07	39		
325 12°20	12 16.62	-	S0:	15.8	1.03	0.30			
	11 59.3			4					
326	12 16.64	-	dE:	20.0	0.25				
	6 46.2			4					
327	12 16.65	B	$S0_1(6)$	14.8	0.86	0.30			
Z	6 39.4			7					
328 13°29	12 16.65	M	ImIV	16.9	1.10	0.37	2180	99	
Boe 113	13 09.7			5			10		
329 6°15	12 16.67	-	ImV?	16.8	0.65	0.40			
	6 16.0			4					
330 13°28	12 16.68	M	dE2,N	16.7	0.80	0.10			
	13 07.8			4					
331	12 16.70	B	pec	15.0	0.89	0.19			
Z	6 34.3			7					
332	12 16.70	B	$S0_1(6)$	15.0	0.77	0.34			
Z	6 35.1			7					
333	12 16.70	M	dE:	19.3	0.41				
	14 04.2			4					
334 RMB 56	12 16.70	M	BCD	16.2	0.60	0.04	-250	16	
	14 09.6			8			25		
335 15°18	12 16.73	M	dE3:	17.8	0.80	0.15			
	15 40.3			4					
336	12 16.74	-	dE4?,N?	16.2	0.70	0.22			
	6 09.3			4					
337 IC 3147	12 16.74	B	(S+E)(tides)	14.95	0.98		7836	12	*
Z	12 17.5			2			35		
338	12 16.78	-	dE3,N	16.5	0.80	0.15			
	5 44.7			4					
339	12 16.79	-	?	18.2	0.43	0.18			
	6 58.9			4					
340	12 16.81	-	BCD	14.43	0.95	0.40			
Z	6 11.5		or merger	2					
341 NGC 4260	12 16.81	-	SBa(s)	12.70	1.64	0.30	1935	20	
SA UGC 7361	6 22.8			1	1.42	0.28	86		
342 NGC 4259	12 16.82	-	$S0_1(7)$	14.59	1.26	0.60	2401	47	
Z UGC 7359	5 39.3			1	1.06	0.38	27		
343 IC 3148	12 16.82	-	SBd(s)II	15.1	0.95	0.00	2411	12	
Z 8°15	8 08.8			7			44		
344	12 16.83	-	E2	15.3	0.30	0.10			
	6 04.5			4					
345 NGC 4261	12 16.84	-	E2	11.31	1.69	0.13	2200	11	
Z UGC 7360	6 06.2			1	1.59	0.08	38		
346 6°16	12 16.84	-	dE5,N	16.7	0.84	0.30			
	6 30.7			4					
347	12 16.84	B	S0/a	15.2	0.86	0.30			
Z	12 19.1			7					
348 IC 3149	12 16.86	B	$SB0_3(r)/a$	15.04	1.16	0.00	8127	21	
Z	12 34.7			2			100		
349	12 16.89	M	dE	18.6	0.53				
	6 32.1			4					
350 13°30	12 16.91	M	ImIV-V:	17.2	0.92	0.15			
	13 35.2			4					
351	12 16.92	-	E7	14.92	1.13	0.48			
Z	5 19.5			2					
352 IC 3150	12 16.94	B	merger	15.2	0.73	0.30	7277	12	
Z	8 04.5			7			36		
353	12 16.96	M	dE?	19.0	0.73				
	12 29.1			4					
354 14°23	12 16.96	M	dE0	16.0	0.86	0.00			
	14 16.2			4					
355 NGC 4262	12 16.97	M	$SB0_{2/3}$	12.41	1.32	0.06	1366	34	
SA UGC 7365	15 09.3			1	1.34	0.03	7		
356 IC 3151	12 17.00	B	SBa(r)I	14.63	1.03	0.30	7377	12	
Z	9 41.6			2			31		
357	12 17.03	-	?	19.0	0.26				
	6 43.7			4					
358 NGC 4264	12 17.04	-	SBa(s)	13.80	1.16	0.16	2633	11	
Z UGC 7364	6 07.5			1	1.03	0.08	75		
359 IC 3153	12 17.07	B	Sc(r)I-II	14.8	0.80	0.07			
Z	5 40.5			7					
360 15°19	12 17.07	M	dE:	18.5:	0.95:				
	15 43.7			4					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
361		12 17.08	M	dEl:	17.4	0.58	0.05			
		15 26.3			4					
362	NGC 4266	12 17.16	-	Sa (on edge)	14.51	1.43	0.70			
Z	UGC 7368	5 49.0			1	1.32	0.61			
363	IC 3156	12 17.19	B	SBc(s):	14.51	0.91	0.15	5784	12	
Z		9 25.6			2			46		
364	12°21	12 17.19	M	ImV?	17.3	0.97	0.15			
		12 33.4			4					
365		12 17.20	-	dE4:	18.7	0.65	0.25			
		4 07.2			4					
366	IC 3155	12 17.20	-	$S0_1(6)$	14.89	1.10	0.45	2045	5	
Z		6 17.2			1	1.03	0.28	100		
367		12 17.21	-	ImV?	17.2	0.60	0.09			
		5 44.1			4					
368		12 17.21	-	dE:	19.0	0.38				
		7 54.4			4					
369	NGC 4267	12 17.21	M	$SB0_1$	11.80	1.67	0.03	1009	34	
SA	UGC 7373	13 04.6			1	1.54	0.03	13		
370		12 17.22	B	S	15.1	0.73	0.30			
Z		17 50.4			7					
371	NGC 4268	12 17.24	-	$S0_2(6)$	13.73	1.30	0.50	2318	11	
Z	UGC 7371	5 33.7			1	1.21	0.41	75		
372	14°24	12 17.25	M	dE0,N:	18.0	0.65	0.00			
		14 58.9			4					
373	NGC 4269	12 17.26	-	$S0_1(2)$	13.69	1.26	0.15	2535	11	
Z	UGC 7372	6 17.8			1	1.19	0.17	75		
374	IC 3157	12 17.26	B	$S0_1(6)$	14.95	1.03	0.33	17770:	12	
Z		12 41.9			2			(52)		
375	NGC 4270	12 17.28	-	$S0_1(6)$	13.11	1.43	0.33	2347	11	
SA	UGC 7376	5 44.5			1	1.34	0.35	50		
376		12 17.29	-	dE:	20.0	0.27				
		7 01.7			4					
377		12 17.30	B	SBc(s)II	14.7	0.95	0.00			
Z		7 16.1			7					
378	15°20	12 17.30	M	dE:	18.8:	0.64				
		15 56.9			4					
379	6°17	12 17.31	-	?	17.0	0.95	0.44			
		6 16.6			4					
380		12 17.34	M	BCD	15.2	0.95	0.62			
Z		8 00.3			7					
381	6°18	12 17.35	M	ImV	16.5:	1.03	0.18	482	10	
		6 56.6			4			10		
382	NGC 4273	12 17.38	-	SBc(s)II	12.37	1.40	0.19	2378	48	
SA	UGC 7380	5 37.3			1	1.36	0.17	4		
383		12 17.41	-	dE?	20.0	0.18				
		9 50.3			4					
384		12 17.43	-	dE?	20.0	0.26				
		6 36.6			4					
385	UGC 7383	12 17.48	B	Sbc(r)I.2	14.46	1.21	0.18	7374	91	
Z		8 53.1			1	1.10	0.16	17		
386	NGC 4277	12 17.51	-	SBa	14.47	1.16	0.20	2499	5	
Z		5 37.2			1	0.97	0.05	100		
387	6°20	12 17.51	M	dE	18.5	0.53				
		6 00.0			4					
388	6°19	12 17.51	-	dE6:	17.4	0.86	0.35			
		6 17.5			4					
389	IC 781	12 17.51	M	dS0(4),N	14.4	1.10	0.19	1330	49	
Z		15 14.3			7			28		
390		12 17.52	-	dE3	16.9	0.51	0.18			
		5 41.6			4					
391		12 17.52	M	dE0	18.5	0.56	0.00			
		14 04.4			4					
392		12 17.55	B	SBc(r)I	14.91	0.73	0.12	19336	12	
Z		8 05.4			2			46		
393	NGC 4276	12 17.58	-	Sc(s)II	13.25	1.30	0.00	2616	50	
Z	UGC 7385	7 58.0			1	1.24	0.00	7		
394	9°11	12 17.60	M	dE3,N	17.7	0.60	0.17			
		9 44.7			4					
395		12 17.61	B	Sc(s)II	14.60	1.16	0.12	7388	12	
Z		8 55.3			2			32		
396		12 17.66	-	dE4?,N	17.0	0.56	0.19			
		4 32.8			4					
397		12 17.66	-	dE5?,N	15.0	0.98	0.26			
Z		6 53.9			7					
398		12 17.67	-	dE0?,N	18.3	0.26	0.00			
		12 57.0			4					
399		12 17.69	-	dE	19.0	0.43				
		6 11.7			4					
400		12 17.70	B	Sc(r)II	14.52	0.86	0.06	9094	12	
Z		17 37.5			2			34		

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
401		12 17.71	M	dEl:	17.7	0.68	0.05			
		13 08.6			4					
402		12 17.72	-	dE0,N	18.2	0.53	0.02			
		5 19.1			4					
403	10°11	12 17.74	M	dE0:	18.0	0.73	0.00			
		10 35.8			4					
404	UGC 7387	12 17.75	-	Scd (on edge)	15.0	1.33	0.90			
Z		4 28.6			6	1.33	1.02			
405		12 17.75	-	dE:	20.0	0.26				
		6 16.6			4					
406		12 17.77	B	SBbc(r) pec	15.00	0.75	0.03			
Z		8 48.6			2					
407	IC 3167	12 17.77	M	dSB0(3),N:	14.64	1.16	0.30	2078:		12
Z		9 49.4		or dE5 pec,N:	2			(68)		
408	NGC 4281	12 17.81	-	$S0_3(6)$	12.27	1.62	0.46	2711		34
SA	UGC 7389	5 39.9			1	1.49	0.31	20		
409	6°21	12 17.83	-	dE2	18.0	0.46	0.09			
		6 25.0			4					
410	RMB 169	12 17.84	M	BCD	17.1	0.33	0.30	272		15
		12 27.8			5			30		
411	NGC 4282	12 17.85	B	$S0_3$ (on edge)	14.53	1.03	0.30	6542		5
Z		5 51.1			2			75		
412		12 17.85	-	dE	20.0	0.43				
		10 57.4			4					
413	14°25	12 17.85	-	ImIII?	18.0:	0.73	0.48			
		14 10.7			4					
414	14°26	12 17.87	M	dE2	17.2	0.86	0.12			
		14 58.3		or ImV	4					
415		12 17.88	-	Sd:	14.82	1.16	0.30			
Z		7 11.2			2					
416		12 17.89	M	dE	20.0	0.56				
		13 04.4		or ImV	4					
417	IC 3170	12 17.90	B	Sbc(s)I-II	14.51	0.73	0.00	7526		12
Z		9 42.1			2			34		
418	15°21	12 17.90	M	dE3	17.3	0.80	0.15			
		15 03.8			4					
419	IC 3174	12 17.94	B	Sb(r)I	15.04	1.03	0.30			
Z		10 31.4			2					
420	IC 3173	12 17.95	B	Sa	15.04	0.69	0.26			
Z		11 37.2			2					
421	13°32	12 17.96	M	dE2	17.0	0.78	0.10			
		13 47.8			4					
422		12 17.97	M	dE0	18.0	0.80	0.00			
		18 36.0			4					
423		12 18.01	-	ImIV:	17.3	0.81	0.48			
		3 14.8			4					
424	IC 3175	12 18.01	B	Sb(r)II	14.86	0.86	0.52	5904		12
Z		10 07.9			2			32		
425	8°16	12 18.05	M	ImV:	17.3	0.73	0.05			
		8 28.8			4					
426	13°33	12 18.06	M	dE0,N	18.5	0.73	0.00			
		13 09.7			4					
427		12 18.12	-	dE?	18.5	0.29				
		5 04.5			4					
428	BB 18	12 18.14	M	BCD	17.5	0.70	0.54	790		15
		14 10.1			5			10		
429	14°27	12 18.20	-	?	17.2	0.58	0.12			
		14 54.7			4					
430		12 18.21	-	dE2?	19.0	0.30	0.10			
		12 30.6			4					
431	13°34	12 18.24	M	dE3?	18.2	0.62	0.15			
		13 02.1			4					
432		12 18.24	M	dE:	19.0	0.63				
		17 30.5			4					
433		12 18.25	-	?	19.5	0.29				
		6 03.8			4					
434	NGC 4287	12 18.26	B	S (on edge)	14.65	1.26	0.70			
Z		5 55.1			2					
435		12 18.26	B	S	14.87	0.91	0.27	7725		12
Z		17 17.6			2			37		
436	6°23	12 18.27	-	dE4:,N?	15.9	0.86	0.20			
		6 59.9			4					
437		12 18.27	M	dE5,N	14.54	1.18	0.30	1474		12
Z		17 45.9			1	1.23	0.29	46		
438		12 18.28	-	dE	19.5	0.26				
		5 29.2			4					
439		12 18.29	-	dE4?	16.2	0.73	0.25			
		7 20.0			4					
440		12 18.31	-	dE2:	17.2	0.80	0.11			
		5 30.6			4					

TABLE II (a). (continued)

VCC Cat. Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1) (2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
441 6°22	12 18.34 6 36.0	-	?	18.5 4	0.41				
442 IC 3188	12 18.37	B	Sbc(s)II	14.64	1.00	0.20	5877	12	
Z	11 17.2			2			29		
443 IC 3187	12 18.37	B	Sc(r)I	15.2	0.91	0.26			
Z	11 26.3			7					
444 15°22	12 18.37 15 16.2	M	dE5	16.8 4	1.10	0.30			
445 12°22	12 18.39 12 36.2	M	dE,N:	20.0 4	0.73:				
446	12 18.41 6 36.9	M	Im/BCD:	15.5 4	1.03	0.30	825 10	10	
447	12 18.44 9 08.7	M	dE	19.3 4	0.34				
448	12 18.46 13 00.3	-	ImIII?	16.8 4	0.43				
449 NGC 4289	12 18.48	-	Sbc (on edge)	14.34	1.73	1.00	2530	14	
Z UGC 7403	3 59.9			1	1.59	0.93	5		
450	12 18.52	-	S0 pec	15.08	1.03	0.48			
Z	7 21.3			2					
451	12 18.53 8 42.7	-	dE?	20.0 4	0.26				
452 12°23	12 18.54 12 02.1	M	dE4,N	15.8 4	0.95	0.22			
453	12 18.55 11 52.4	-	Sm?	16.0 4	1.00	0.66			
454 15°23	12 18.58 15 59.8	M	dE3	17.4 4	0.81	0.15			
455	12 18.60 9 59.2	M	dE	19.0 4	0.34				
456	12 18.60 12 34.6	M	dE	19.5 4	0.43				
457	12 18.62 6 38.7	-	dE	19.0 4	0.49				
458 9°12	12 18.66 9 14.4	M	dE4	16.3 4	0.80	0.24			
459	12 18.66	M	BCD	14.95	0.80	0.37	2107	51	
Z	17 54.9			2			9		
460 NGC 4293	12 18.69	M	Sa pec	11.20	1.80	0.24	933	11	
SA UGC 7405	18 39.7			1	1.78	0.31	38		
461 13°35	12 18.70 13 37.4	M	dE4	16.5 4	0.95	0.22			
462 NGC 4292	12 18.71	-	SB0/a	13.50	1.33	0.12	2258	11	
Z UGC 7404	4 52.2			1	1.32	0.18	25		
463	12 18.71 12 42.9	M	dE0,N	19.0 4	0.65	0.00			
464	12 18.73 5 37.3	-	BCD?	17.5 4	0.91	0.65			
465 NGC 4294	12 18.75	M	SBc(s)II-III	12.62	1.69	0.50	357	52	
SA UGC 7407	11 47.4			1	1.49	0.37	4		
466	12 18.75 15 01.8	M	dE0	17.7 4	0.65	0.00			
467	12 18.77 4 03.9	-	Im?	17.7 4	0.73	0.08			
468	12 18.77 4 21.3	-	BCD?	16.0 4	0.60	0.04			
469 16°12	12 18.79 16 53.2	-	dE2?	18.5 4	0.56	0.12			
470	12 18.82 6 40.3	-	dE	19.4 4	0.26				
471 9°13	12 18.87 9 53.9	M	Im?	18.5 4	0.56	0.30			
472 15°24	12 18.88 15 53.8	M	ImIV-V or dE4	16.4 4	0.86	0.20			
473 NGC 4297	12 18.91	B	S0(7) (tides)	15.2	0.95	0.52			*
Z	6 56.9			4					
474	12 18.91 7 59.8	-	dE?	20.0 4	0.03				
475 NGC 4296	12 18.92	B	SB0(5) pec	13.8	1.30	0.30	4227	11	*
Z UGC 7409	6 55.9			4	1.25	0.21	24		
476 10°12	12 18.93 10 45.7	-	ImIV:	17.9 4	0.40	0.15			
477 15°25	12 18.93 15 18.1	M	ImV	16.7 4	1.10	0.30	1866 10	12	
478	12 18.93 15 46.8	M	dE7	19.0 4	0.76	0.52			
479	12 18.94 8 25.7	-	Amorphous	16.6 4	0.95	0.30			
480	12 18.94 13 04.6	-	dE?	19.5 4	0.26				

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
481		12 18.97	M	dE	18.3	0.65:				
		15 46.6			4					
482	NGC 4301	12 19.00	-	S0(8)/a	14.77	1.16	0.60			
Z	UGC 7411	5 03.4			1	1.14	0.45			
483	NGC 4298	12 19.01	M	Sc(s)III	12.08	1.65	0.25	1135	37	
SA	UGC 7412	14 53.1			1	1.50	0.22	4		
484		12 19.03	-	dE	19.2	0.16				
		6 49.3			4					
485		12 19.04	B	S	15.38	0.80	0.37			
Z		16 15.7			2					
486	IC 782	12 19.07	-	SB0/SBa(r)	14.4	1.30	0.44			
Z		6 02.6			7					
487		12 19.09	M	dE:	19.5:	0.56:				
		6 33.8			4					
488	7°15	12 19.10	-	?	17.2	0.95	0.70			
		7 31.7			4					
489		12 19.11	-	dE5?	16.8	0.73	0.30			
		4 40.2			4					
490	IC 783	12 19.11	M	dS0(3),N	14.33	1.26	0.15	1293	49	
Z	16°13	16 01.4			1	1.18	0.02	29		
491	NGC 4299	12 19.13	M	Scd(s)III	12.86	1.37	0.00	234	31	
SA	UGC 7414	11 46.8			1	1.24	0.03	4		
492	NGC 4300	12 19.14	-	Sa ring	13.76	1.43	0.48	2310	12	
Z	UGC 7413	5 39.8			1	1.19	0.36	31		
493		12 19.15	M	dE	19.0	0.41				
		13 28.3			4					
494	15°26	12 19.16	M	dE5	16.0	1.03	0.30			
		15 21.3			4					
495		12 19.16	-	dE?	19.5	0.56				
		18 06.3			4					
496	9°15	12 19.17	M	dE?	18.7	0.53				
		9 37.9			4					
497	NGC 4302	12 19.17	M	Sc (on edge)	12.55	1.92	0.62	1149	37	
SA	UGC 7418	14 52.6			1	1.72	0.66	3		
498		12 19.18	M	dE,N:	18.5	0.34				
		10 30.7			4					
499	9°14	12 19.21	M	dE2:	17.6	0.51	0.08			
		9 30.9			4					
500	IC 3199	12 19.21	B	$RSB0_2(4)$	14.89	1.16	0.25	7947	12	
Z	UGC 7417	10 52.2			1	1.03	0.27	27		
501	13°36	12 19.26	M	dE5?	17.2	0.64	0.30			
		13 06.2			4					
502		12 19.28	M	dE2	19.5	0.43	0.10			
		12 07.8			4					
503	8°17	12 19.29	M	dE3,N	16.8	0.73	0.18			
		8 49.1			4					
504	10°13	12 19.30	M	dE4	16.0	0.70	0.19			
		10 01.1			4					
505		12 19.30	M	dE3,N	17.8	0.90	0.15			
		18 42.5			4					
506		12 19.34	M	dE0	18.5:	0.60	0.00			
		5 01.9			4					
507		12 19.34	-	dE?	19.0	0.40				
		15 39.7			4					
508	NGC 4303	12 19.36	-	Sc(s)I.2	10.17	1.91	0.09	1566	37	
SA	M 61	4 45.1			1	1.78	0.04	2		
509	UGC 7423	12 19.37	-	Sd	14.98	1.26	0.30	1258	10	
Z		6 43.7		or SmIV	1	1.13	0.24	10		
510	15°27	12 19.38	M	dE3,N	14.90	1.10	0.15			
	UGC 7425	15 55.3			1	1.10	0.16			
511		12 19.39	M	dE0:	18.2	0.49	0.00			
		8 37.5			4					
512	12°25	12 19.39	M	SBmIV	15.3	1.26	0.40	152	10	
	UGC 7421	12 14.6			4			10		
513		12 19.41	-	BCD?	15.1	0.73	0.08			
Z		2 37.4			7					
514	8°19	12 19.42	M	Sc(s) pec:	14.70	1.10	0.07	852	10	
Z	UGC 7424	8 57.1			1	1.10	0.03	10		
515		12 19.42	M	dE5	18.2	0.95	0.30			
		18 10.3			4					
516		12 19.46	-	?	20.0	0.26				
		12 54.8			4					
517	UGC 7422	12 19.47	B	SBab(s)	14.9	1.10	0.41			
Z		5 22.7			6	1.03	0.47			
518		12 19.47	-	?	20.0	0.41				
		11 54.8			4					
519	14°28	12 19.48	M	dE:,N:	19.5	0.56				
		14 24.7			4					
520	8°18	12 19.49	-	Im?	17.5	0.80	0.37			
		8 30.9			4					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec.(1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
521		12 19.51	M	dE0	18.5	0.86	0.00			
		17 28.6			4					
522	NGC 4305	12 19.52	M	Sa	13.28	1.51	0.30	1888	53	
Z	UGC 7432	13 01.1			1	1.34	0.23	12		
523	NGC 4306	12 19.53	M	d:SB0(5),N	13.75	1.37	0.21	1508	53	
Z	UGC 7433	13 04.0			1	1.21	0.08	20		
524	NGC 4307	12 19.55	M	Sbc (on edge)	12.79	1.69	0.73	1072	37	
SA	UGC 7431	9 19.1			1	1.57	0.60	25		
525	7°16	12 19.56	-	dE4,N	16.7	0.65	0.22			
		7 03.4			4					
526	IC 3211	12 19.56	B	Sc(r)I-II	14.78	1.10	0.00	5971	4	
Z	UGC 7430	9 16.0			1	1.07	0.08	100		
527	IC 3209	12 19.57	B	Sbc(s)I-II	14.75	1.03	0.60	7521	54	
Z		12 02.0			2			17		
528		12 19.58	B	Sab	15.1	0.86	0.60			
Z		6 22.9			7					
529	10°15	12 19.60	M	dE4,N	18.2	0.56	0.22			
		10 10.3			4					
530	16°14	12 19.61	M	ImIV-V	15.8	1.21	0.18	1298	12	
		16 04.7			4			10		
531		12 19.63	B	Sa?	15.00	0.95	0.30			
Z		5 13.8			2					
532		12 19.64	M	dE1?	18.7	0.63	0.05			
		11 55.2			4					
533		12 19.66	-	dE	18.7	0.41				
		5 28.7			4					
534	NGC 4309	12 19.66	-	SBa pec	13.59	1.40	0.30	1082	55	
Z	UGC 7435	7 25.3			1	1.31	0.23	13		
535	16°15	12 19.67	M	dE4,N?	17.0	1.16	0.20			
		16 43.5			4					
536		12 19.67	M	dE	19.0	0.80				
		17 15.0			4					
537		12 19.68	M	dE:	18.5	0.49				
		12 58.3			4					
538		12 19.70	-	E0	15.4	0.40	0.00			
		7 26.5			4					
539	14°29	12 19.71	M	dE3,N	16.8	0.91	0.15			
		14 25.2			4					
540		12 19.74	M	dE3:	19.4	0.57	0.15			
		11 13.8			4					
541		12 19.75	-	BCD	16.0	0.65	0.40			
		4 33.8			4					
542	IC 3218	12 19.78	-	dE0,N	15.00	0.73	0.00			
Z		7 12.3			2					
543	UGC 7436	12 19.79	M	dE5	14.77	1.26	0.40	861	49	
Z		15 02.4			1	1.13	0.19	58		
544		12 19.80	M	ImIII	17.0	0.51	0.18			
		9 18.5			4					
545	IC 783A	12 19.80	M	dE2,N	15.17	0.91	0.18	1159	19	
		16 00.7			1	0.81	0.00	49		
546	10°17	12 19.82	M	dE6	15.7	1.16	0.38			
		10 52.6			4					
547		12 19.82	M	dE2	18.8	0.63	0.10			
		15 26.1			4					
548		12 19.83	-	ImV?	18.3	0.65	0.10			
		4 01.4			4					
549		12 19.83	-	?	16.6	0.73	0.18			
		5 57.5			4					
550		12 19.87	-	ImIII?	16.5	0.56	0.30			
		9 46.0			4					
551		12 19.87	M	dE4	16.3	1.16	0.20			
		17 17.8			4					
552	NGC 4303A	12 19.89	-	SBc(s)II-III	13.61	1.33	0.12	1273	56	
Z	UGC 7439	4 50.6			1	1.22	0.06	5		
553		12 19.89	M	dE:	19.0	0.45				
		10 36.2			4					
554	15°28	12 19.89	M	dE2,N:	17.2	0.93	0.10			
		15 44.9			4					
555		12 19.91	-	dE,N	19.2	0.51				
		7 22.5			4					
556		12 19.93	M	dE	19.5	0.34				
		13 26.3			4					
557		12 19.95	-	?	18.7	0.49	0.23			
		13 35.5			4					
558		12 19.97	-	dE2,N	16.2	0.60	0.10			
		7 23.8			4					
559	NGC 4312	12 19.98	M	Sab	12.56	1.80	0.61	153	57	
Z	UGC 7442	15 49.0			1	1.67	0.55	7		
560	12°27	12 19.99	M	dE2:,N	17.0	0.56	0.00			
		12 04.9			4					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
561	9°16	12 20.05	M	dE3?	18.0	0.43	0.18			
		9 05.4			4					
562	12°28	12 20.06	M	BCD	16.6	0.65	0.10	44	15	
	RMB 175	12 26.1			5			30		
563	16°16	12 20.06	M	dE4	16.3	1.16	0.20			
		16 37.6			4					
564		12 20.07	M	dE	20.0	0.43				
		11 34.2			4					
565	6°24	12 20.09	M	ImIV	15.7	0.86	0.26	877	10	
		6 17.4			4			10		
566		12 20.09	-	SBmIII:	15.8	0.95	0.30	1407	10	
		8 34.4			4			10		
567	IC 3225	12 20.10	-	ScdIII	14.36	1.43	0.57	2360	14	
Z	UGC 7441	6 57.3			1	1.26	0.37	10		
568		12 20.11	B	S (on edge)	14.91	1.10	0.57			
Z		6 30.1			2					
569		12 20.11	-	dE6?	19.5	0.60	0.40			
		10 54.2			4					
570	NGC 4313	12 20.11	M	Sab	12.73	1.80	0.64	1443	58	
Z	UGC 7445	12 04.9			1	1.59	0.54	6		
571		12 20.14	M	$SB0_1(6)$	14.74	1.03	0.40	1047	12	
Z		8 13.6			2			37		
572		12 20.16	B	E6	14.9	0.86	0.37			
Z		3 25.1			7					
573		12 20.16	B	Sc	15.1	0.73	0.18			
Z		5 54.9			7					
574	9°17	12 20.16	M	dE3	17.0	0.73	0.18			
		9 06.6		or ImV	4					
575	NGC 4318	12 20.17	M	E4	14.14	0.91	0.27	1215	12	
Z	UGC 7446	8 28.5			1	1.01	0.12	17		
576	NGC 4316	12 20.17	M	Sbc (on edge)	13.70	1.49	0.69	1252	92	
Z	UGC 7447	9 36.6			1	1.43	0.65	5		
577		12 20.20	-	dE2,N	18.3	0.56	0.12			
		5 41.6			4					
578		12 20.20	-	?	17.6	0.93	0.19			
		18 49.5			4					
579		12 20.21	-	dE	20.0	0.29				
		7 32.5			4					
580		12 20.21	-	BCD?	17.2	0.95	0.52			
		12 34.3			4					
581		12 20.23	-	?	20.0	0.07				
		7 22.7			4					
582		12 20.24	M	dE	20.0	0.16				
		8 42.7			4					
583	15°29	12 20.24	M	ImIV-V:	15.7	1.16	0.30			
		15 46.6			4					
584	8°20	12 20.25	M	ImIV-V	15.8	0.95	0.10			
		8 11.4			4					
585	11°11	12 20.25	M	ImV	17.0:	1.16	0.20			
		11 37.6			4					
586		12 20.25	M	dE4	18.5	0.52	0.22			
		11 43.4			4					
587	7°17	12 20.26	-	dE1,N:	17.6	0.65	0.06			
		7 21.6			4					
588		12 20.28	B	Sb	14.6	0.80	0.00			
Z		3 22.8			7					
589		12 20.30	-	dE:	19.8	0.10				
		7 20.8			4					
590	9°18	12 20.30	M	dE:	19.0	0.29				
		9 10.7			4					
591		12 20.31	-	dE,N	20.0	0.14				
		7 24.7			4					
592		12 20.31	M	dE6,N	16.6	0.98	0.42			
		13 52.2			4					
593	IC 3229	12 20.33	-	S	15.08	1.16	0.60			
Z	UGC 7448	6 57.4			1	1.07	0.44			
594	15°30	12 20.34	M	dE5	16.3	1.00	0.26			
		15 33.1			4					
595		12 20.36	-	dE?	19.5	0.26:				
		12 40.1			4					
596	NGC 4321	12 20.38	M	Sc(s)I	10.11	2.05	0.05	1568	20	
SA	M 100	16 06.0			1	1.84	0.05	4		
597		12 20.39	B	S0(8)	14.8	1.21	0.65			
Z		3 01.4			7					
598	8°21	12 20.39	-	dE3:	18.4	0.43	0.18			
		8 00.6			4					
599	NGC 4320	12 20.42	B	pre merger?	14.76	1.21	0.21	7997	12	
Z	UGC 7452	10 49.4			1	1.07	0.31	41		
600		12 20.42	M	dE4	18.0	0.76	0.22			
		15 50.2			4					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec.(1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
601		12 20.43	-	dE?	19.7	0.25				
		7 18.1			4					
602		12 20.43	M	dE0	18.3	0.56	0.00			
		8 28.2			4					
603		12 20.45	M	dE:	19.5	0.43				
		14 02.0			4					
604		12 20.47	-	dE	18.5	0.56				
		4 39.4			4					
605		12 20.49	M	dE,N	19.7	0.43				
		13 50.2			4					
606		12 20.50	-	dE3?,N	18.2	0.43	0.18			
		6 03.8			4					
607		12 20.50	M	dE7	19.2	0.73	0.48			
		14 11.3			4					
608	NGC 4322	12 20.50	M	dE4,N	14.70	1.16	0.30	1803	19	
Z	16°17	16 11.0			1	1.11	0.09	100		
609		12 20.52	-	?	19.2	0.03				
		8 48.7			4					
610		12 20.52	M	dE1:	20.0	0.69	0.05			
		16 36.4			4					
611	8°22	12 20.53	M	dE5 pec:	15.7	1.03	0.30			
		8 36.5			4					
612		12 20.54	-	?	17.3	0.56	0.12			
		4 24.5			4					
613	NGC 4324	12 20.55	-	Sa(r) ring	12.60	1.64	0.54	1678	34	
SA	UGC 7451	5 31.7			1	1.39	0.32	11		
614		12 20.55	-	dE2?	18.6	0.47	0.10			
		15 04.9			4					
615	12°29	12 20.56	M	dE,N	17.5:	0.82				
		12 17.3			4					
616	NGC 4325	12 20.57	B	E4	14.40	1.16	0.20	7709	12	
Z		10 53.8			2			39		
617	IC 3238	12 20.57	B	S0(4)	14.59	0.73	0.18	12744	12	
Z		14 44.1		or Sa	2			29		
618	14°31	12 20.58	-	Im?	16.5	0.88	0.23			
		14 01.3			4					
619	16°18	12 20.58	M	dE5:	18.2	0.79	0.30			
		16 13.1			4					
620	IC 3239	12 20.63	M	SmIII	15.2	1.03	0.48	746	23	
Z		12 00.3			7			20		
621		12 20.64	-	dE2	18.2	0.63	0.10			
		4 48.9			4					
622	9°19	12 20.64	M	dE5	16.7	0.64	0.34			
		9 18.3			4					
623	NGC 4326	12 20.65	B	SBa(r)	14.09	1.30	0.14	7112	59	
Z	UGC 7454	6 20.9			1	1.24	0.09	40		
624	13°37	12 20.65	M	dE,N	20.0	0.64				
		13 41.7			4					
625	15°31	12 20.66	M	dE4:	18.2	0.76	0.22			
		15 08.3			4					
626		12 20.67	-	dE?	18.5	0.21				
		10 09.2			4					
627	IC 3244	12 20.67	B	Sc(s)II	14.9	1.10	0.15	12836	60	
Z		14 39.9			6	0.87	0.06	30		
628		12 20.71	M	ImV:	18.2	0.56	0.10			
		7 58.0			4					
629		12 20.75	-	ImV:	18.2	0.60	0.04			
		7 11.3			4					
630	NGC 4330	12 20.75	M	Sd (on edge)	13.10	1.86	0.60	1565	61	
Z	UGC 7456	11 38.7			1	1.63	0.62	6		
631		12 20.76	-	dE	18.5	0.16				
		7 56.5			4					
632	7°18	12 20.79	M	dE3,N	17.5	0.73	0.18			
		7 20.6			4					
633	7°19	12 20.80	M	dE5:	18.0:	0.95	0.30			
		7 52.2			4					
634	NGC 4328	12 20.80	M	dE1,N	14.24	1.21	0.11	499	49	
Z		16 05.8			1	1.17	0.03	24		
635		12 20.82	-	dE?	19.0	0.43				
		13 37.2			4					
636		12 20.82	-	dE0,N	16.44	0.65	0.00			
		16 08.7		or $S0_1(0)$	3	0.70				
637	NGC 4333	12 20.83	B	SBab(s)	14.27	1.03	0.08	6975	59	
Z		6 19.0			1	1.04	0.07	40		
638	NGC 4334	12 20.85	B	SBab(s)	13.93	1.56	0.12	4226	49	
Z	UGC 7458	7 45.1			1	1.38	0.32	29		
639		12 20.87	-	dE:	19.0	0.42				
		7 16.6			4					
640		12 20.91	M	dE	19.2	0.43				
		8 04.8			4					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
641		12 20.92	-	BCD?	15.08	0.73	0.48			
Z		6 05.6			2					
642		12 20.95	M	dE0	18.3	0.49	0.00			
		5 46.4			4					
643		12 20.96	M	dE1	18.5	0.63	0.05			
		15 09.9			4					
644		12 20.96	M	dE	20.0	0.56				
		17 49.1			4					
645	11°12	12 21.00	M	dE0,N	18.2	0.73	0.00			
		11 32.9			4					
646		12 21.00	M	dE3:	18.8	0.80	0.15			
		18 04.3			4					
647		12 21.02	M	dE:	20.0	0.57				
		18 05.9			4					
648	NGC 4339	12 21.03	-	$S0_{1/2}(0)$	12.32	1.46	0.06	1287	34	
SA	UGC 7461	6 21.6			1	1.37	0.01	20		
649	IC 3255	12 21.03	B	Sbc(s)II	14.6	0.76	0.11	6460	12	
Z		9 54.6			7			36		
650	13°38	12 21.03	-	?	20.0	0.73				
		13 34.6			4					
651	9°20	12 21.04	M	dE4:	17.5	0.56	0.19			
		9 47.6			4					
652	9°21	12 21.05	M	dE0	17.8	0.43	0.00			
		9 00.2			4					
653	7°20	12 21.06	-	dE0	17.6	0.56	0.00			
		7 52.4			4					
654	NGC 4340	12 21.06	M	$RSB0_2(5)$	12.03	1.65	0.28	930	34	
SA	UGC 7467	17 00.1			1	1.61	0.10	10		
655	NGC 4344	12 21.10	M	S pec,N:/BCD	13.21	1.16	0.00	1154	62	
Z	UGC 7468	17 49.1			1	1.29	0.04	10		
656	NGC 4343	12 21.11	-	Sb	13.14	1.49	0.42	1014	58	
Z		7 14.0			1	1.44	0.51	5		
657	NGC 4342	12 21.11	-	$S0_1(7)$	13.54	1.16	0.51	714	20	
SA	IC 3256	7 19.9			1	1.15	0.31	50		
658	10°19	12 21.11	M	dE5	18.5	0.86	0.30			
		10 18.5			4					
659	12°30	12 21.11	M	dE2:	18.3	0.54	0.10			
		12 54.3			4					
660		12 21.12	M	Im?	19.5	0.56				
		14 05.7			4					
661	7°21	12 21.14	-	dE	18.5	0.56				
		7 34.2			4					
662	UGC 7464	12 21.15	B	Sc(s)	14.80	1.30	0.70			
Z		3 14.2			1	1.22	0.65			
663		12 21.19	-	dE6?	18.2	0.91	0.35			
		18 56.4			4					
664	IC 3258	12 21.20	M	ScIII-IV	13.75	1.51	0.14	-432	63	
Z	UGC 7470	12 45.3			1	1.21	0.05	7		
665		12 21.21	B	Sb	14.8	0.95	0.59	7096	12	
Z		9 36.9			7			47		
666		12 21.24	M	ImV:	16.8	1.10	0.24			
		17 04.1			4					
667	IC 3259	12 21.27	-	Sc(s)	14.24	1.33	0.30	1422	64	
Z	UGC 7469	7 28.0			1	1.25	0.22	10		
668	15°32	12 21.27	M	dE0:	16.5	0.65	0.00			
		15 24.2			4					
669		12 21.28	-	dE4,N?	16.3	0.73	0.25			
		6 20.2			4					
670		12 21.29	B	SBab(s)	15.06	0.80	0.07			
Z		4 21.9			2					
671	6°25	12 21.33	M	dE6	18.0	0.86	0.35			
		6 02.0			4					
672	NGC 4341	12 21.34	-	$S0_1(8)$	14.21	1.37	0.64	934	33	
Z	IC 3260	7 23.0			1	1.27	0.41	32		
673		12 21.34	M	dE	20.0	0.34				
		11 02.2			4					
674	14°32	12 21.34	M	dE0,N	18.0:	0.86	0.00			
		14 09.6			4					
675		12 21.35	B	Sa?	15.0	0.60	0.20			
Z		3 21.6			7					
676		12 21.36	-	dE,N	19.5	0.43				
		7 10.7			4					
677		12 21.36	-	dE1?	18.2	0.67	0.03			
		18 54.6			4					
678	13°39	12 21.37	M	dE,N	19.0:	0.73				
		13 02.9			4					
679	11°13	12 21.38	-	?	15.7	1.10	0.34			
		11 46.1			4					
680		12 21.39	-	dE:	19.0	0.38				
		6 17.9			4					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec.(1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
681		12 21.39	-	?	19.5	0.26				
		13 16.5			4					
682		12 21.42	B	$S0_1(6)$	15.2	0.51	0.35	7609	12	
Z		9 32.7			7			32		
683		12 21.43	-	dE	19.0	0.21				
		8 11.0			4					
684	13°40	12 21.44	M	dE0,N	16.0	0.62	0.00			
		13 10.0			4					
685	NGC 4350	12 21.44	M	$S0_1(8)$	11.99	1.60	0.44	1241	34	
SA	UGC 7473	16 58.3			1	1.50	0.44	19		
686		12 21.45	M	dE	18.5	0.49				
		9 46.3			4					
687	12°31	12 21.45	M	dE3	17.7	0.95	0.15			
		12 10.2			4					
688	NGC 4353	12 21.46	M	Sc(s)II-III	13.94	1.10	0.24	1059	5	
Z	IC 3265	8 03.7			1	1.11	0.18	75		
689		12 21.47	-	?	19.8	0.49				
		17 55.8			4					
690		12 21.48	B	S (on edge)	15.23	1.10	0.85			
Z		5 35.4			2					
691		12 21.48	M	dE	19.5	0.49				
		12 08.2			4					
692	NGC 4351	12 21.49	M	Sc(s)II.3	13.04	1.56	0.19	2297	65	
Z	UGC 7476	12 28.9			1	1.31	0.15	10		
693		12 21.50	-	SBmIII?	15.06	1.16	0.06	2048	10	
Z		5 27.4			2			10		
694		12 21.54	-	dE?	18.8	0.49				
		7 48.5			4					
695	10°20	12 21.54	M	dE0,N	15.7	0.80	0.00			
		10 20.7			4					
696		12 21.54	-	dE5?	18.3	0.80	0.29			
		17 49.6			4					
697	IC 3267	12 21.55	-	Sc(s)II.2	14.17	1.16	0.00	1225	66	
Z	UGC 7474	7 19.2			1	1.04	0.01	10		
698	NGC 4352	12 21.55	M	$S0_1(8)$	13.60	1.49	0.33	2106	11	
Z	UGC 7475	11 29.7			1	1.29	0.34	22		
699	IC 3268	12 21.57	M	Sc(s)III-IV	14.22	1.26	0.15	728	62	
Z	UGC 7477	6 53.1		or SmIII	1	0.91	0.02	10		
700		12 21.59	B	$S0_1(0)$	14.9	0.60	0.00	7717	12	
Z		9 39.7			7			29		
701		12 21.60	M	dE	19.2	0.64				
		11 25.3			4					
702		12 21.61	M	dE:,N:	19.5	0.26				
		8 47.4			4					
703	9°22	12 21.64	M	ImV	17.5	0.73	0.30			
		9 30.8			4					
704		12 21.64	M	dE	20.0	0.58				
		13 38.9			4					
705	12°33	12 21.66	M	dE2,N	17.2	0.91	0.11			
		12 13.4			4					
706		12 21.68	M	dE0,N	17.3	0.56	0.00			
		11 48.5			4					
707	12°32	12 21.68	M	dE	19.0:	0.79				
		12 02.3			4					
708		12 21.68	M	dE0,N	19.0	0.43	0.00			
		13 54.6			4					
709		12 21.68	M	dE1	19.0	0.56	0.05			
		14 45.1			4					
710	Mark 51	12 21.69	-	dS0:	14.83	0.95	0.40	957	67	
Z		4 30.3			1	1.17	0.48	44		
711	7°22	12 21.69	M	dE1,N	15.8	0.80	0.07			
		7 27.1			4					
712	IC 3271	12 21.69	B	Sc(r)I	14.37	1.10	0.00	7212	91	
Z	UGC 7481	8 13.9			1	1.07	0.00	18		
713	NGC 4356	12 21.69	M	Sc (on edge)	14.04	1.60	0.80	1146	93	
Z	IC 3273	8 48.9			1	1.41	0.64	17		
714		12 21.70	-	dE2?	18.3	0.73	0.08			
		17 46.9			4					
715	IC 3274	12 21.71	B	S0:	14.8	0.86	0.30	6815	12	
Z		9 32.6			7			28		
716		12 21.71	M	dE3	19.2	0.62	0.15			
		15 12.3			4					
717		12 21.72	-	?	20.0	0.07				
		8 50.1			4					
718		12 21.76	B	Sb	15.0	0.58	0.00	6652	12	
Z		9 36.6			7			35		
719		12 21.78	M	dE2:	18.5	0.45	0.10			
		13 11.4			4					
720		12 21.79	B	$S0_1(6)$	15.3	0.51	0.26			
Z		9 46.2			7					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
721		12 21.82	-	?	20.0	0.56:				
		13 41.7			4					
722	NGC 4360	12 21.83	B	E2	13.47	1.16	0.12	7019	12	
Z	UGC 7484	9 34.2			1	1.23	0.10	65		
723		12 21.83	-	dS0?	15.04	0.91	0.05			
Z		13 18.4			2					
724	7°23	12 21.88	-	dE:	18.3	0.41				
		7 24.5			4					
725	15°33	12 21.88	M	dE2,N	16.0	0.95	0.10			
		15 21.0			4					
726		12 21.88	M	dE,N	18.7	0.80				
		16 39.9			4					
727		12 21.89	-	dE1	18.4	0.40	0.07			
		7 23.4			4					
728		12 21.91	M	dE,N:	18.5	0.41				
		12 32.4			4					
729		12 21.91	B	Sbc(r)I-II	14.87	1.15	0.11	7624	91	
Z		13 30.6			2			18		
730		12 21.93	-	dE:	20.0	0.10				
		6 57.4			4					
731	NGC 4365	12 21.93	M	E3	10.51	1.95	0.15	1240	12	
SA	UGC 7488	7 35.7			1	1.79	0.13	12		
732		12 21.99	M	dE0	18.5	0.65	0.00			
		12 05.4			4					
733		12 22.00	M	dE4,N	18.2	0.33	0.23			
		8 54.8			4					
734		12 22.01	B	SBbc(s)	15.1	0.80	0.24			
Z		6 59.3			7					
735		12 22.02	M	Im?	19.3	0.45				
		14 16.9			4					
736	IC 3284	12 22.09	B	SBa(r)	15.04	0.86	0.06			
Z		11 06.9			2					
737		12 22.11	-	Sd/BCD?	14.94	1.13	0.48			
Z		4 16.6			2					
738		12 22.11	-	?	19.0	0.60	0.34			
		12 03.9			4					
739		12 22.12	-	SdIII-IV	14.37	1.40	0.00	926	10	
Z		3 34.8			2			10		
740		12 22.12	M	SBmIII	15.7	0.95	0.34	874	10	
		8 46.7			4			10		
741		12 22.14	-	BCD?	15.5	0.80	0.54			
		4 00.2			4					
742		12 22.17	M	dE,N	18.3	0.73				
		15 59.0			4					
743		12 22.18	M	dE	20.0	0.43:				
		11 45.7			4					
744	8°23	12 22.23	-	dE?	19.0	0.49				
		8 11.8			4					
745	NGC 4366	12 22.24	M	dE6,N	14.67	1.03	0.38	1234:	12	
Z		7 37.8			2			(46)		
746	8°24	12 22.25	M	dE2,N	17.7	0.56	0.12			
		8 42.9			4					
747	9°24	12 22.26	M	dE0,N	16.2	0.86	0.00			
		9 16.1			4					
748	14°33	12 22.26	M	dE4:	17.3	0.86	0.20			
		14 51.2			4					
749		12 22.27	B	SBab(r)	14.78	0.86	0.00	7250	12	
Z		9 04.8			2			42		
750		12 22.28	M	dE5,N	14.95	1.03	0.30			
Z		7 02.2			2					
751	IC 3292	12 22.28	M	dS0	15.3	0.88	0.15	710	12	
Z		18 28.4			7			39		
752		12 22.29	M	dE	19.0:	0.49:				
		12 06.0			4					
753	13°41	12 22.33	M	dE0,N	15.5	0.95	0.00			
		13 23.2			4					
754	15°34	12 22.33	M	dE4	19.0	0.72	0.22			
		15 17.3			4					
755	7°24	12 22.35	M	dE3,N	16.6	0.73	0.18			
		7 50.0			4					
756	9°25	12 22.35	M	dE1,N:	16.2	0.80	0.03			
		9 46.2			4					
757		12 22.36	M	dE0:	18.6	0.53	0.00			
		14 56.0			4					
758	NGC 4370	12 22.38	M	$S0_3(6)$	13.69	1.26	0.30	787	12	
Z	UGC 7492	7 43.3			1	1.21	0.25	37		
759	NGC 4371	12 22.38	M	$SB0_2(r)(3)$	11.80	1.80	0.31	943	34	
Z	UGC 7493	11 58.8			1	1.59	0.20	19		
760	12°34	12 22.41	M	dE0 pec?	17.6	0.65	0.00			
		12 06.7			4					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
761	15°35	12 22.48 15 52.7	M	dE4	17.3 4	0.99	0.22			
762		12 22.50 7 47.0	M	dE3,N	15.3 4	0.80	0.15			
763	NGC 4374	12 22.52	M	E1	10.26	1.95	0.00	1000	34	
SA	M 84	13 09.8			1	1.70	0.06	8		
764		12 22.53	B	$S0_2(6)$	14.9	0.73	0.36			
Z		5 36.4			7					
765		12 22.53 13 31.3	M	dE1,N	16.0 4	0.68	0.05			
766		12 22.53 13 37.6	-	dE?	20.0 4	0.26				
767		12 22.54 13 21.2	M	dE	19.5 4	0.38				
768	IC 3298	12 22.54	-	SBc	14.91	1.11	0.56	2436	12	
Z		17 17.5			2			37		
769		12 22.56 15 59.2	M	dE1	16.3 4	0.58	0.05			
770		12 22.58	B	Sc (on edge):	15.19	1.10	0.85			
Z		4 45.2			2					
771	6°26	12 22.58 6 22.4	-	dE0	18.0 4	0.53	0.00			
772		12 22.59 4 41.6	-	BCD?	17.0 4	0.56	0.40			
773	7°25	12 22.59 7 10.1	-	dE4?	18.2 4	0.65	0.22			
774		12 22.63 10 43.9	M	dE	18.5 4	0.51				
775	12°35	12 22.64 12 39.6	M	dE3	17.5 4	0.72	0.15			
776		12 22.66 6 35.7	-	dE2	18.2 4	0.51	0.08			
777		12 22.66 14 43.0	M	dE1	18.0 4	0.82	0.05			
778	NGC 4377	12 22.68	M	$S0_1(3)$	12.67	1.43	0.18	1371	34	*
SA	UGC 7501	15 02.4			1	1.26	0.08	14		
779	13°42	12 22.69 13 18.1	M	dE0,N	17.7 4	0.73	0.00			
780	15°36	12 22.70 15 07.3	M	dE1	18.0 4	0.76	0.05			
781	IC 3303	12 22.71	M	$dS0_3(5)$,N:	14.46	1.07	0.34	-254	68	
Z	UGC 7500	12 59.5			1	1.14	0.19	27		
782		12 22.72 7 13.7	-	?	19.5 4	0.12				
783		12 22.72 7 30.9	-	dE	19.0 4	0.43				
784	NGC 4379	12 22.72	M	$S0_1(2)$	12.62	1.43	0.13	1069	34	
SA	UGC 7502	15 53.0			1	1.32	0.06	10		
785	NGC 4378	12 22.73	-	Sa(s)	12.16	1.58	0.09	2554	31	
SA	UGC 7497	5 12.0			1	1.52	0.03	4		
786	IC 3305	12 22.73	M	dE7,N	15.11	1.32	0.58	2388	68	
Z	UGC 7499	12 07.9			1	1.07	0.39	30		
787	NGC 4376	12 22.75	M	Scd(s)III	13.69	1.30	0.23	1136	56	
Z	UGC 7498	6 00.9			1	1.22	0.22	10		
788		12 22.76 11 53.1	M	dE7,N:	15.8 4	1.00	0.51			
789	13°43	12 22.76 13 31.9	M	dE5:	19.0 4	0.75	0.30			
790	14°34	12 22.76 14 26.8	M	dE1,N	16.4 4	0.80	0.07			
791	6°27	12 22.83 6 59.3	M	dE7:	16.4 4	0.95	0.47			
792	NGC 4380	12 22.83	M	Sab(s)	12.36	1.64	0.30	967	31	
SA	UGC 7503	10 17.6			1	1.57	0.22	5		
793	13°44	12 22.83 13 21.0	M	ImIII-IV,N?	16.5 4	0.78	0.15	1910 20	12	
794	UGC 7504	12 22.84 16 42.4	M	dS0(8) pec:	15.5 4	1.33	0.60			
795	15°37	12 22.86 15 04.7	M	dE7,N:	18.0 4	0.94	0.52			
796		12 22.87 12 57.1	M	dE,N:	20.0 4	0.26				
797		12 22.88 18 25.1	M	dE3,N	17.0 4	0.65	0.17			
798	NGC 4382	12 22.88	M	$S0_1(3)$ pec	10.09	1.86	0.24	760	34	
SA	M 85	18 28.0			1	1.85	0.13	12		
799	IC 787	12 22.90	B	Sa	14.8	1.16	0.60	9225	12	
Z		16 24.0			7			29		
800		12 22.92 12 57.2	M	dE	18.2 4	0.56				

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
801	NGC 4383	12 22.92	M	Amorphous	12.68	1.51	0.30	1710	100	
SA	UGC 7507	16 44.7			1	1.34	0.26	3		
802	13°46	12 22.95	M	BCD	17.4	0.91	0.48	-215	15	
	Boe 146	13 46.4			5			20		
803	12°36	12 22.96	M	dE5	18.0	0.91	0.30			
		12 46.3			4					
804		12 22.96	M	dE,N?	19.0:	0.60				
		13 15.4			4					
805		12 23.00	B	Sbc	14.9	0.73	0.27			
Z		3 43.0			7					
806		12 23.00	-	ImV?	18.4	0.49				
		5 05.5			4					
807		12 23.00	M	dE:	19.0	0.33				
		8 05.0			4					
808	14°35	12 23.00	M	dE5,N	17.7	1.03	0.30			
		14 25.7			4					
809	IC 3311	12 23.01	M	Sc (on edge)	14.55	1.26	0.60	-147	91	
Z	UGC 7510	12 32.2			1	1.33	0.70	18		
810	13°45	12 23.03	M	dE0,N	16.5	0.65	0.00			
		13 30.1			4					
811		12 23.06	M	dE	16.5:	1.10:				
		10 31.7		or ImV	4					
812	15°38	12 23.07	M	dE1,N	16.5	0.80	0.07			
		15 28.2			4					
813	16°21	12 23.07	M	dE0,N	18.2	0.93	0.02			
		16 52.4			4					
814		12 23.08	-	?	19.0:	0.34				
		13 07.6			4					
815	13°47	12 23.09	M	dE2,N	16.1	0.84	0.10			*
		13 25.2			4					
816	16°20	12 23.09	M	dE5,N	15.3	1.16	0.30			
		16 07.7			4					
817	IC 3313	12 23.10	M	dE1	15.0	1.16	0.06			
Z	16°19	16 06.7			7					
818	16°22	12 23.10	M	Im?	18.3	0.82	0.17			
		16 56.5			4					
819		12 23.11	-	dE	19.5	0.12				
		7 50.1			4					
820		12 23.11	-	dE3:,N	17.0	0.43	0.18			
		8 00.5			4					
821		12 23.11	M	ImV:	19.5	0.26:				
		8 02.2			4					
822		12 23.12	B	SBc	15.04	0.86	0.35			
Z		9 11.6			2					
823	12°38	12 23.12	M	dE0,N	15.7	0.80	0.00	1691	19	
		12 35.5			4			33		
824		12 23.12	M	dE0,N	18.0	0.65	0.00			
		14 25.5			4					
825	10°22	12 23.14	M	ImIV,N?	15.9	1.10	0.00			
		10 51.4			4					
826	UGC 7512	12 23.15	-	ImIV	15.0	1.18	0.30	1508	10	*
Z		2 26.0			4			10		
827	IC 3322A	12 23.16	M	Sc (on edge)	13.76	1.65	0.92	1001	17	
Z	UGC 7513	7 29.5			1	1.55	0.81	8		
828	NGC 4387	12 23.16	M	E5	13.02	1.30	0.34	573	67	
Z	UGC 7517	13 05.3			1	1.27	0.21	24		
829		12 23.19	-	dE?	18.5	0.60				
		15 51.1			4					
830		12 23.19	-	dE?	19.3	0.60				
		18 16.1			4					
831		12 23.20	B	Sc	15.04	0.73	0.36			
Z		9 18.0			2					
832		12 23.20	-	dE?	19.0	0.10				
		12 57.1			4					
833		12 23.21	M	dE0,N	17.48	0.65	0.06			
		13 17.7			3	0.52				
834	UGC 7516	12 23.23	-	Sc(s)II	14.61	1.15	0.30			
Z		4 47.3			1	1.13	0.24			
835		12 23.23	-	?	20.0	0.34				
		5 14.6			4					
836	NGC 4388	12 23.23	M	Sab	11.83	1.80	0.61	2529	34	
SA	UGC 7520	12 56.3			1	1.71	0.56	19		
837		12 23.24	-	?	19.0	0.43				
		7 46.1			4					
838	12°39	12 23.24	M	dE2	17.5	0.43	0.10			
		13 01.9			4					
839	10°23	12 23.25	M	dE0:	17.1	0.65	0.00			
		10 22.1			4					
840	11°15	12 23.25	M	dE3	17.4	0.84	0.15			
		11 56.6			4					

TABLE II (a). (continued)

VCC Cat. (1)	Name 1 Name 2 (2)	R.A.(1950) Dec.(1950) (3)	VC memb. (4)	Hubble type (5)	B_T Source (6)	$\log D_{est}$ $\log D_{25}$ (7)	$\log R_{est}$ $\log R_{25}$ (8)	$v_\odot$ ϵ (9)	Source (10)	Note (11)
841	RMB 46	12 23.26	M	BCD	16.7	0.80	0.46	503	91	
	BB 135	15 13.8			8			14		
842		12 23.28	-	dE:	20.0	0.26				
		12 30.1			4					
843		12 23.28	M	dE3	18.7	0.37	0.15			
		13 04.7			4					
844		12 23.28	M	dE	18.9	0.43				
		13 23.8			4					
845	14°36	12 23.28	M	dE6?	19.0	0.83	0.40			
		14 07.7			4					
846	13°48	12 23.30	M	dE1,N:	16.2	0.72	0.05			
		13 28.3			4					
847		12 23.31	B	SBc	14.92	0.86	0.37			
Z		9 12.3			2					
848		12 23.33	M	ImIII pec/BCD	14.72	1.16	0.07			
Z		6 05.1			2					
849	NGC 4390	12 23.33	M	Sbc(s)II	13.27	1.33	0.08	1104	32	
Z	UGC 7519	10 43.8			1	1.26	0.10	10		
850	13°49	12 23.34	M	ImIV?	18.8	0.41				
		13 28.0			4					
851	IC 3322	12 23.36	M	Sc (on edge)	14.14	1.43	0.63	1169	93	
Z	UGC 7518	7 50.0			1	1.40	0.63	16		
852	11°14	12 23.36	M	dE:	19.0:	0.56:				
		10 59.8			4					
853		12 23.38	M	dE	20.0	0.26				
		12 05.1			4					
854	12°41	12 23.39	M	dE8,N	17.3	1.03	0.78			
		13 02.7			4					
855	7°26	12 23.40	M	dE6,N	17.2	0.77	0.37			
		7 30.9			4					
856	IC 3328	12 23.41	M	dE1,N	14.42	1.02	0.05	972	49	
Z		10 19.8			2			32		
857	NGC 4394	12 23.41	M	SBb(sr)I-II	11.76	1.65	0.00	944	20	
SA	UGC 7523	18 29.4			1	1.59	0.04	10		
858		12 23.42	B	S0 pec?	14.7	0.70	0.07	5700	1	
Z		4 45.2			7			300		
859	UGC 7522	12 23.43	-	Sc (on edge)	14.61	1.56	0.89			
Z		3 42.5			1	1.44	0.94			
860		12 23.43	M	dE	19.5	0.43				
		9 40.7			4					
861	15°39	12 23.44	M	dE4:	17.9	0.76	0.20			
		15 33.1			4					
862		12 23.46	-	dE3?	18.0	0.57	0.15			
		7 44.0			4					
863	14°37	12 23.46	M	dE3	18.0:	0.78	0.15			
		14 18.9			4					
864	IC 3327	12 23.46	B	SBa	15.02	0.80	0.03	13222	12	
Z		15 09.8			2			35		
865	NGC 4396	12 23.46	M	Sc(s)II	13.02	1.62	0.52	-128	38	
Z	UGC 7526	15 56.8			1	1.55	0.47	3		
866		12 23.46	M	dE	20.0	0.56:				
		16 40.4			4					
867		12 23.48	M	ImIV?	19.0	0.33				
		8 28.2			4					
868		12 23.53	M	dE4	20.0	0.33	0.23			
		11 14.2			4					
869	9°26	12 23.56	M	ImV	15.0:	0.95	0.00			
		9 14.6		or dE0	4					
870	IC 3331	12 23.56	M	dS0(5),N	14.68	1.16	0.43			*
Z		12 05.8			2					
871	12°40	12 23.56	M	dE4,N	15.4	1.09	0.22			
		12 50.2			4					
872	13°50	12 23.57	M	dE0,N	17.00	0.65	0.00			
		13 08.2			3	0.59				
873	NGC 4402	12 23.58	M	Sc (on edge)	12.56	1.69	0.53	232	69	
Z	UGC 7528	13 23.4			1	1.61	0.49	5		
874	NGC 4405	12 23.59	-	Sc(s)/S0	12.99	1.33	0.23	1747	55	
Z	UGC 7529	16 27.5			1	1.30	0.16	21		
875		12 23.61	-	?	19.8	0.46				
		7 34.7			4					
876		12 23.62	M	dE,N:	18.5	0.49				
		12 40.2			4					
877	13°51	12 23.64	M	dE0,N	17.6	0.56	0.00			
		13 56.9			4					
878	15°40	12 23.64	M	dE5	17.3	1.00	0.26			
		15 12.6			4					
879	6°28	12 23.66	M	dE	19.0:	0.56:				
		6 21.7			4					
880		12 23.67	-	dE3?	19.6	0.46	0.15			
		12 21.7			4					

TABLE II (a). (continued)

VCC Cat. Name 1 Name 2	R.A.(1950) Dec.(1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ Source		Note
(1) (2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
881 NGC 4406	12 23.67	M	$S0_1(3)/E3$	10.06	2.03	0.18	-227	34	*
SA M 86	13 13.4			1	1.87	0.13	8		
882	12 23.71	M	dE3,N	16.7	0.73	0.18			
	13 14.4			4					
883 8°25	12 23.72	M	dE:	19.0	0.26				
	8 01.9			4					
884	12 23.72	M	dE:	18.5:	0.73:				
	13 25.1			4					
885	12 23.73	B	$S0_1(4)$	14.65	0.91	0.26			*
Z	5 45.2			2					
886	12 23.73	M	dE	20.0	0.26				
	13 37.1			4					
887	12 23.77	-	S?	19.5	0.43:				
	7 01.3			4					
888 8°26	12 23.77	M	ImIII	15.0	1.16	0.32	1089	10	
	8 37.5			4			10		
889 IC 789	12 23.79	B	SB0/a	14.71	1.16	0.36	7392	12	
Z UGC 7533	7 44.3			1	1.10	0.29	28		
890	12 23.80	-	BCD?	16.0	0.16	0.00			
	6 56.7			4					
891	12 23.80	M	dE:	20.0	0.26				
	7 04.0			4					
892	12 23.80	M	dE:	18.32	0.34				
	12 47.0			3	0.37				
893	12 23.82	M	dE	20.0	0.29				
	8 03.1			4					
894	12 23.82	M	dE	19.0	0.37				
	8 50.2			4					
895 10°24	12 23.84	M	dE0,N	18.3	0.65	0.00			
	10 51.7			4					
896 13°52	12 23.84	M	dE3,N	17.8	0.65	0.14			
	13 03.6			4					
897	12 23.84	M	dE4:	19.5	0.57	0.22			
	14 02.1			4					
898	12 23.87	-	dE?	19.5	0.26				
	13 39.0			4					
899 6°29	12 23.89	M	ImIV	16.6	0.86	0.30			
	6 59.1			4					
900 14°38	12 23.91	M	dE2	18.5	0.65	0.10			
	14 00.8			4					
901 16°24	12 23.91	M	dE3:	18.0	0.73	0.18			
	16 48.0			4					
902 9°27	12 23.92	M	dE0	18.3	0.56	0.00			
	9 04.4			4					
903	12 23.92	M	dE2,N	18.91	0.38	0.10			
	13 11.7			3	0.26				
904 NGC 4410A	12 23.93	B	pec	14.41	0.86	0.12	7546	33	*
Z UGC 7535	9 17.8			2			30		
905 NGC 4411A	12 23.94	M	SBc(s)II	13.42	1.43	0.00	1277	70	
Z UGC 7537	9 08.9			1	1.35	0.04	9		
906	12 23.94	M	dE:	19.0	0.41				
	10 15.1			4					
907 NGC 4410B	12 23.95	B	pec	14.15	0.86	0.06	7533	33	*
Z UGC 7535	9 17.8			2			60		
908	12 23.96	B	Sc	14.82	0.86	0.40	7470	12	
Z	8 20.2			2			25		
909 16°25	12 23.97	M	dE3:	16.2	0.73	0.18			
	16 37.5			4					
910	12 23.98	M	dE	20.0	0.43				
	11 45.1			4					
911	12 23.99	B	E3	15.30	0.91	0.18			
Z	16 54.7			2					
912 NGC 4413	12 24.00	M	SBbc(rs)II-III	12.97	1.56	0.22	96	17	
Z UGC 7538	12 53.3			1	1.39	0.17	8		
913	12 24.01	M	dE:	20.0	0.34				
	7 45.0			4					
914 9°28	12 24.02	M	dE,N:	19.0	0.43				
	9 16.2			4					
915 11°17	12 24.02	M	dE0,N	18.2	0.65	0.00			
	11 33.9			4					
916	12 24.02	M	d:E1,N:	15.3	0.43	0.06	1349	12	
	13 01.1			4			72		
917 IC 3344	12 24.02	M	dE6	14.8	1.03	0.38	1375	12	
Z	13 51.4			7			66		
918	12 24.03	B	SBb	15.3	0.95	0.30	13560	12	
Z	17 07.2			7			37		
919 IC 790	12 24.04	B	S0 pec	14.68	0.86	0.30	7525	12	
Z	9 18.8			2			25		
920 10°25	12 24.04	M	dE1?,N	17.2	0.67	0.05			
	10 15.5			4					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
921	NGC 4412	12 24.05	-	SBbc(s)II	13.14	1.33	0.08	2293	71	
SA	UGC 7536	4 14.5			1	1.18	0.04	13		
922	10°26	12 24.05	M	dE,N	19.5	0.26				
		10 28.9			4					
923		12 24.07	M	dE0,N	19.5	0.34	0.00			
		13 04.7			4					
924		12 24.07	-	dE2?	19.3	0.33	0.12			
		14 08.9			4					
925		12 24.09	M	dE	19.5:	0.73:				
		15 21.9			4					
926	9°29	12 24.11	M	dE3:	17.6	0.73	0.18			
		9 46.4			4					
927		12 24.11	M	dE,N	19.5:	0.43:				
		13 21.3			4					
928	12°42	12 24.12	M	dE6,N	16.11	0.95	0.40			
		12 47.2			3					
929	NGC 4415	12 24.14	M	d:El,N	13.72	1.10	0.10	910	12	
Z	UGC 7540	8 42.7			1	1.17	0.03	38		
930	13°54	12 24.14	M	dE3	18.0	0.70	0.15			
		13 07.2			4					
931	11°18	12 24.17	M	dE2,N	15.8	0.95	0.10			
		11 11.0			4					
932		12 24.17	M	dE?	18.6	0.48				
		11 14.2			4					
933	9°30	12 24.19	M	dE2,N	16.6	0.80	0.10			
		9 06.0			4					
934		12 24.19	B	SBa(s)	14.75	0.86	0.12	6938	33	
Z		9 19.5			2			30		
935		12 24.19	M	dE	19.0	0.38				
		11 17.0			4					
936	11°19	12 24.21	M	dEl,N	15.5	0.73	0.03			
		11 39.5			4					
937	13°55	12 24.23	M	dE3	19.0	0.76	0.15			
		13 32.7			4					
938	NGC 4416	12 24.24	M	SBc(s)II.2	12.89	1.37	0.03	1392	72	
Z	UGC 7541	8 11.7			1	1.26	0.05	4		
939	NGC 4411B	12 24.25	M	Sc(s)II	12.92	1.51	0.00	1266	73	
Z	UGC 7546	9 09.7			1	1.43	0.00	9		
940	IC 3349	12 24.25	M	dEl,N	14.78	1.10	0.07	1563	15	
Z	12°43	12 43.7			2	1.02		57		
941		12 24.26	M	dE:	19.1	0.34				
		13 39.4			4					
942		12 24.27	M	dE4	19.77:	0.36	0.22			
		12 40.5			3	0.17				
943		12 24.27	M	dE0	18.6	0.37	0.00			
		13 57.3			4					
944	NGC 4417	12 24.30	M	$S0_1(7)$	12.08	1.65	0.55	832	34	
SA	UGC 7542	9 51.7			1	1.56	0.40	19		
945	IC 3355	12 24.30	M	SBmIII	14.82	1.21	0.35	80	74	
Z	DDO 124	13 27.2			1	1.12	0.35	69		
946	IC 3357	12 24.31	B	Sc:	15.2	0.73	0.57	13697	12	
Z		10 03.5			7			46		
947		12 24.33	B	E0	15.7	0.56	0.00	13645	12	
Z		16 33.0			7			34		
948		12 24.35	M	dE:	20.0	0.37:				
		8 01.8			4					
949	10°27	12 24.35	M	dE4,N	15.1	1.16	0.20			
		10 56.8			4					
950	IC 3356	12 24.36	M	SmIV	14.49	1.33	0.30	1098	101	
Z	11°20	11 50.3			1	1.22	0.15	7		
951	IC 3358	12 24.37	M	dE2 pec,N	14.23	1.28	0.18	2066	53	
Z	UGC 7550	11 56.7		or dS0(2),N	1	1.17	0.08	21		
952	10°28	12 24.38	-	SB?	16.5	0.76	0.25			
		10 09.3			4					
953	13°57	12 24.39	M	dE5?,Npec?	15.7	0.86	0.30	-629	19	
		13 50.6			4			65		
954	6°30	12 24.40	M	dE3,N:	17.2	0.80	0.15			
		6 14.8			4					
955		12 24.40	-	dE?,N	19.0	0.29				
		10 27.6			4					
956	13°56	12 24.40	M	dEl,N:	18.75:	0.56	0.07			
		13 14.1			3					
957	NGC 4420	12 24.42	-	Sc(s)III	12.67	1.40	0.37	1680	20	
SA	UGC 7549	2 46.3			1	1.35	0.28	10		
958	NGC 4419	12 24.42	M	Sa	12.13	1.64	0.40	-196	34	
SA	UGC 7551	15 19.4			1	1.53	0.43	10		
959		12 24.43	M	dE2	19.5	0.23	0.10			
		12 41.9			4					
960		12 24.44	M	dE	20.0	0.31				
		7 04.6			4					

TABLE II (a). (continued)

VCC Cat. / Name 1 / Name 2	R.A.(1950) / Dec. (1950)	VC memb.	Hubble type	B_T / Source	$\log D_{est}$ / $\log D_{25}$	$\log R_{est}$ / $\log R_{25}$	$v_\odot$ / ϵ	Source	Note
(1) (2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
961	12 24.44	B	SB0	15.04	1.03	0.48	7280	5	
Z	9 14.1			2			75		
962 12°44	12 24.46	M	dE3	17.53:	0.91	0.13			
	12 46.6			3					
963 15°41	12 24.46	M	Im:	17.2	0.80	0.24			
	15 03.7			4					
964	12 24.51	M	dE2	18.4	0.39	0.10			
	14 23.1			4					
965 IC 3363	12 24.52	M	dE7,N	15.40	1.26	0.52	791:	15	
Z 12°45	12 50.1			3	1.16		(60)		
966 NGC 4421	12 24.52	M	$SB0_2(3)$	12.45	1.63	0.26	1603	67	
Z UGC 7554	15 44.3			1	1.43	0.08	23		
967	12 24.53	M	dE4	18.72:	0.42	0.15			
	13 08.5			3	0.25:				
968 13°58	12 24.57	M	dE4?	19.2	0.49	0.19			
	13 36.1			4					
969	12 24.58	M	dE	20.0	0.34				
	11 40.5			4					
970	12 24.60	M	dE:	19.5	0.37:				
	8 05.5			4					
971 NGC 4423	12 24.61	M	Sd (on edge)	14.28	1.58	0.85	1113	12	
Z UGC 7556	6 09.4			1	1.35	0.71	35		
972 13°59	12 24.61	M	dE3,N	16.9	0.83	0.15			
	13 36.7			4					
973 IC 792	12 24.62	B	Sc(s)II	14.61	1.26	0.38	6205	91	
Z UGC 7558	16 36.3			1	1.26	0.43	16		
974	12 24.63	M	dE3:,N	16.4	0.73	0.18			
	8 40.0			4					
975 7°27	12 24.64	M	Scd(s)II	13.58	1.69	0.03	932	39	
Z UGC 7557	7 32.4			1	1.49	0.08	7		
976 9°32	12 24.65	M	dE4	18.0	0.56	0.19			
	9 06.9			4					
977	12 24.65	M	dE4,N	17.89	0.43	0.22			
	12 18.9			3	0.49				
978	12 24.65	M	dE6:	18.10:	0.80	0.37			
	12 23.4			3					
979 NGC 4424	12 24.67	M	Sa pec	12.32	1.73	0.30	439	37	
SA UGC 7561	9 41.8			1	1.57	0.29	4		
980 IC 3365	12 24.67	M	Scd(s)III	14.17	1.49	0.39	2339	46	
Z UGC 7563	16 10.5			1	1.33	0.22	7		
981	12 24.68	B	$SB0_1(1)$	14.95	0.56	0.00	7437	12	
Z	9 59.3			2			30		
982	12 24.69	M	dE6	17.3	0.95	0.40			
	18 05.9			4					
983 9°31	12 24.70	M	dE	18.0:	0.65				
	9 53.8			4					
984 NGC 4425	12 24.70	M	SBa	12.82	1.57	0.47	1883	13	
SA UGC 7562	13 00.7			1	1.53	0.44	50		
985	12 24.72	-	BCD?	17.0	0.65	0.32			
	4 32.3			4					
986	12 24.72	M	dE	19.5	0.37				
	10 58.7			4					
987	12 24.73	M	dE:	18.5:	0.56:				
	12 56.5			4					
988	12 24.74	M	dE,N	20.0	0.37:				
	7 02.6			4					
989 7°28	12 24.75	-	Sc	15.8	0.69	0.05			
	7 56.9		or Im	4					
990 IC 3369	12 24.76	M	dE4,N	14.81	0.95	0.22	1727	12	
Z	16 18.1			2			34		
991	12 24.77	M	dE6	14.7	1.21	0.35			
	14 25.5			4					
992 8°27	12 24.78	M	dE0,N	15.8	0.65	0.00			
	8 29.4			4					
993	12 24.78	M	dE?	18.5:	0.43				
	9 52.3			4					
994 16°27	12 24.81	M	dE3 pec?	15.9	1.00	0.14			
	16 42.4			4					
995 IC 3371	12 24.82	M	Sc (on edge)	15.32	1.40	1.15	928	91	
Z UGC 7565	11 08.6			1	1.29	0.99	18		
996 13°60	12 24.82	M	dE5	18.41	0.65	0.28			
	13 23.2			3	0.41				
997	12 24.84	M	dE3,N	17.72	0.49	0.15			
	12 20.6			3	0.51				
998 12°46	12 24.85	M	dE4,N:	18.16	0.73	0.22			
	12 36.2			3	0.50				
999	12 24.86	-	dE?	19.7	0.16				
	12 24.4			4					
1000	12 24.88	M	dE3	18.2	0.42	0.15			
	11 31.0			4					

TABLE II (a). (continued)

VCC Cat. Name 1 Name 2	R.A.(1950) Dec.(1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1) (2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1001 13°62	12 24.88 13 59.6	M	Im	16.6 4	0.73	0.18	338 10	10	
1002 NGC 4430	12 24.89	M	SBc(r)II	12.48	1.43	0.05	1451	75	
Z UGC 7566	6 32.3			1	1.43	0.05	4		
1003 NGC 4429	12 24.90	M	$S0_3(6)$/Sa pec	11.15	2.00	0.36	1130	34	
SA UGC 7568	11 23.1			1	1.74	0.33	13		
1004 13°61	12 24.90 13 40.9	M	dE?	19.0: 4	0.64				
1005 14°39	12 24.90 14 01.6	M	dE5,N	16.4 4	0.95	0.30			
1006	12 24.90 14 42.5	M	dE2	18.2 4	0.81	0.10			
1007 UGC 7564	12 24.91	B	Sbc(s)I	15.22	1.10	0.48			
Z	3 34.7			2					
1008	12 24.91 12 13.1	M	dE:	20.0 4	0.10				
1009	12 24.92 8 37.7	M	dE:	19.5 4	0.29				
1010 NGC 4431	12 24.92	M	dS0(5),N	13.72	1.40	0.30	913	12	
Z UGC 7569	12 34.1			1	1.30	0.18	30		
1011 7°29	12 24.94	M	SdmIII	14.85	1.21	0.37	874	10	
Z UGC 7567	7 55.3			1	1.07	0.18	10		
1012	12 24.95 8 40.0	M	dE:	20.0 4	0.16				
1013 9°33	12 24.96 9 36.9	M	ImIII-IV	16.4 4	0.73	0.18			
1014	12 24.96 12 31.7	M	dE2?	18.34: 3	0.57	0.10			
1015	12 24.96 12 32.6	M	dE:	19.8 4	0.10				
1016	12 24.97	B	Sb(r)	14.9	0.95	0.22			
Z	3 32.2			7					
1017 9°34	12 24.97 9 52.0	M	ImV	14.5: 4	1.43	0.27			
1018 NGC 4432	12 25.00	B	Sc(s)I-II	14.81	1.03	0.00	6466:	15	
Z UGC 7570	6 30.5			1	1.03	0.14	(33)		
1019	12 25.00	B	Sa(r)	15.00	0.80	0.15			
Z	8 14.4			2					
1020 11°21	12 25.00 11 53.5	M	dE4,N: or ImIV	16.9 4	0.56	0.22			
1021 IC 3374	12 25.01	M	ImIII	15.04	1.16	0.30			
Z 10°29	10 16.7			2					
1022	12 25.01 11 48.7	M	dE?	20.0 4	0.43				
1023	12 25.05 13 04.7	M	dE	20.0 4	0.34:				
1024	12 25.06 16 01.0	-	dE?,N	18.3 4	0.43				
1025 NGC 4434	12 25.07	M	$E0/S0_1(0)$	12.99	1.16	0.00	1052	33	
Z UGC 7571	8 25.9			1	1.20	0.00	24		
1026 15°42	12 25.08 15 07.3	M	dE2	18.3 4	0.65	0.10			
1027 13°63	12 25.10 13 09.4	M	dE0,N:	18.08 3	0.77	0.00			
1028	12 25.11 14 44.0	-	dS0?	15.7 4	0.73	0.00			
1029	12 25.13 14 49.2	M	dE5	19.0 4	0.56	0.30			
1030 NGC 4435	12 25.14	M	$SB0_1(6)$	11.84	1.56	0.07	775	34	
SA UGC 7575	13 21.4			1	1.47	0.18	15		
1031 8°28	12 25.15 8 48.8	M	dE6 or ImIV-V	16.1 4	1.10	0.37			
1032 6°31	12 25.16 6 38.7	M	Im?	19.5 4	0.27				
1033	12 25.16 16 13.3	M	dE0,N	18.4 4	0.60	0.00			
1034 10°30	12 25.17 10 15.6	M	dE2	18.0 4	0.56	0.10			
1035	12 25.17 12 21.9	-	E4	16.0 4	0.65	0.22			
1036 NGC 4436	12 25.17	M	dE6/dS0(6),N	14.03	1.33	0.38	1163	53	
Z UGC 7573	12 35.5			1	1.27	0.32	50		
1037	12 25.17 12 45.9	M	dE0	19.62 3	0.38 0.00:	0.00			
1038	12 25.18 14 52.4	-	?	18.6 4	0.29	0.00			
1039 11°23	12 25.20 11 29.4	M	dE0 pec:	17.2 4	0.73	0.00			
1040	12 25.21 13 15.5	M	dE3,N	17.5 4	0.56	0.15			

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec.(1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1041		12 25.23 12 01.2	-	?	19.5 4	0.40				
1042		12 25.23 13 08.9	M	dE	18.6 4	0.45				
1043	NGC 4438	12 25.23	M	Sb (tides)	10.91	2.00	0.34	30	34	
SA	UGC 7574	13 17.1			1	1.97	0.38	9		
1044	11°22	12 25.24 11 42.7	M	dE5,N	16.7 4	0.65	0.28			
1045	7°30	12 25.29 7 17.9	M	ImV:	18.7: 4	0.56:				
1046		12 25.29 12 46.4	M	dE	20.0 4	0.29				
1047	NGC 4440	12 25.36	M	SBa(sr)	12.74	1.40	0.07	724	33	
Z	UGC 7581	12 34.2			1	1.30	0.07	18		
1048	UGC 7579	12 25.38	-	Scd (on edge)	15.1	1.33	0.85			
Z		5 59.9			7					
1049	UGC 7580	12 25.38	M	S0(4)	14.20	0.91	0.11	688	12	
Z		8 22.1			1	1.20	0.03	53		
1050		12 25.38 9 07.5	-	dE?	18.5 4	0.21				
1051		12 25.38 12 52.8	-	dE?	19.8 4	0.14				
1052		12 25.39 12 38.7	M	dE	16.0: 4	1.03:				
1053		12 25.39 14 05.7	M	dE	19.5 4	0.41				
1054		12 25.40 8 21.9	M	dE,N	18.5 4	0.16				
1055		12 25.42 11 37.0	-	?	19.0 4	0.56	0.52			
1056		12 25.43 14 44.8	M	dE	18.7 4	0.60				
1057		12 25.45 8 23.5	M	dE	19.5 4	0.37:				
1058		12 25.48	B	S (on edge)	15.3	0.86	0.90			
Z		4 34.1			7					
1059		12 25.48 12 13.4	M	dE6,N	18.0 4	0.73	0.40			
1060		12 25.51 3 11.2	-	SmIII-IV	15.0 4	1.13	0.22	1487 10	10	
1061	15°43	12 25.51 15 43.2	-	dE3?	18.2 4	0.60	0.17			
1062	NGC 4442	12 25.53	M	$SB0_1(6)$	11.40	1.73	0.48	517	34	
SA	UGC 7583	10 04.8			1	1.66	0.37	19		
1063		12 25.54 11 53.0	M	dE	20.0 4	0.34				
1064		12 25.55 13 53.3	M	dE3,N	17.3 4	0.66	0.15			
1065	13°64	12 25.56 13 51.3	M	dE0,N	16.4 4	0.56	0.00			
1066	IC 3379	12 25.56	B	S	16.0:	0.91	0.33	13527	12	*
Z		17 35.0			4			49		
1067		12 25.57 8 20.3	-	?	20.0 4	0.26:				
1068		12 25.57 12 21.3	-	E2	15.85: 3	0.56	0.12			
1069		12 25.57 13 10.4	M	dE6,N	16.44 3	0.95 0.94	0.59			
1070		12 25.57 13 15.2	M	dE,N	19.6 4	0.40				
1071		12 25.58 9 05.4	M	dE	18.5 4	0.32				
1072	NGC 4446	12 25.59	B	Sc(s)II.2	14.41	1.10	0.10	7319	109	
Z	UGC 7586	14 11.3			1	1.07	0.00	18		
1073	IC 794	12 25.62	M	dE3,N	14.23	1.26	0.12	1899	53	
Z	UGC 7585	12 22.1			1	1.23	0.14	19		
1074	8°29	12 25.63 8 43.2	M	dE	19.0 4	0.56:				
1075	IC 3383	12 25.64	M	dE4,N	14.95	1.06	0.22	1844	49	
Z	10°32	10 34.3			2			40		
1076	10°33	12 25.64 10 48.3	M	dE0,N	17.0 4	0.80	0.00			
1077		12 25.64 13 05.0	M	dE0,N	19.21 3	0.26 0.13	0.00			
1078		12 25.65	-	dE5 pec?	15.3	0.86	0.30			
Z		10 02.4			7					
1079	10°31	12 25.65 10 38.5	M	dE2,N	16.4 4	0.87	0.10			
1080		12 25.66	B	S pec(tides)	15.2	0.73	0.00			
Z		7 05.7			7					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1081	13°65	12 25.67 13 17.5	M	dE2	18.8 4	0.43	0.10			
1082		12 25.68 6 35.2	-	?	20.0 4	0.06				
1083		12 25.68 12 14.8	M	dE2	19.05 3	0.26 0.16	0.10			
1084		12 25.69	B	Sb pec	14.9	0.86	0.06	7401	12	
z		7 53.1			7			34		
1085	NGC 4447	12 25.69	B	$RSB0_1(3)$	14.69	1.07	0.16	7203	54	
z		14 10.6			2			20		
1086	NGC 4445	12 25.73	M	S (on edge)	13.66	1.60	0.80	300	12	
z	UGC 7587	9 42.8			1	1.45	0.65	43		
1087	IC 3381	12 25.73	M	dE3,N	14.30	1.26	0.22	645	53	
z	UGC 7589	12 03.9			1	1.16	0.11	27		
1088		12 25.73 14 25.9	M	dE	20.0 4	0.26				
1089	11°24	12 25.74 11 08.7	M	dE3:	18.0 4	0.72	0.15			
1090		12 25.75 10 00.3	M	dE,N	19.0 4	0.41				
1091	UGC 7590	12 25.77	M	Sbc(s)I.8	14.6	1.26	0.52	1117	102	
z		9 00.3			6	1.19	0.51	5		
1092	9°35	12 25.79 9 26.7	M	dE0,N	17.3 4	0.62	0.00			
1093	11°25	12 25.79 11 58.6	M	dE0,N	16.5 4	0.80	0.00			
1094		12 25.80 6 28.3	-	?	17.3 4	0.43	0.10			
1095		12 25.81 8 17.3	M	dE,N	18.5 4	0.26				
1096		12 25.81 11 31.1	M	dE?	19.0 4	0.33				
1097	15°44	12 25.82 15 58.5	M	dE2	19.0 4	0.70	0.10			
1098		12 25.83 9 00.2	M	ImIV-V	18.0 4	0.76	0.20			
1099		12 25.87 11 41.8	M	dE4,N	18.0 4	0.45	0.22			
1100		12 25.87 11 51.3	M	dE3:	18.1 4	0.68	0.15			
1101	13°66	12 25.88 13 28.2	M	dE6,N	15.94 3	1.00 1.00	0.44			
1102		12 25.91 7 13.4	-	Im?	17.7 4	0.65	0.49			
1103		12 25.91 12 37.4	M	dE	20.0 4	0.26				
1104	IC 3388	12 25.93	M	dE5,N	15.31	0.91	0.26	1704	53	
z	13°67	13 05.9			3			31		
1105	14°40	12 25.94 14 25.9	M	dE0,N	16.2 4	0.80	0.00			
1106	10°34	12 25.95 10 47.8	M	ImV:	16.8 4	0.87	0.15			
1107	7°31	12 25.96 7 36.1	M	dE4:,N	15.1 4	0.99	0.22			
1108		12 25.96 8 48.8	M	dE:	19.5 4	0.03				
1109	7°32	12 25.97 7 11.0	M	dE	18.5: 4	0.56:				
1110	NGC 4450	12 25.97	M	Sab pec	10.93	1.88	0.18	1954	37	
SA	UGC 7594	17 21.7			1	1.68	0.14	4		
1111		12 25.98 12 13.3	M	dE4,N	17.70: 3	0.62	0.22			
1112		12 26.00 16 20.4	-	dE?	18.8 4	0.43				
1113		12 26.02 7 50.8	M	dE,N	19.5: 4	0.43:				
1114	8°30	12 26.02	M	ImIII	14.51	1.33	0.38	560	10	
z	UGC 7596	8 54.9			1	1.29	0.39	10		
1115	12°47	12 26.02 12 01.2	M	dE2,N	17.8 4	0.84	0.10			
1116		12 26.09 8 34.8	M	dE	20.0 4	0.34:				
1117		12 26.12 9 06.2	-	dE?	19.0 4	0.10				
1118	NGC 4451	12 26.14	M	Sc(s)III	13.31	1.37	0.30	860	12	
z	UGC 7600	9 32.1			1	1.17	0.15	42		
1119	10°35	12 26.15 10 00.4	M	dE4:,N:	17.0 4	0.86	0.20			
1120	8°31	12 26.16 8 04.9	M	dE2,N	16.6 4	0.67	0.10			

TABLE II (a). (continued)

VCC Cat. / Name 1 / Name 2	R.A.(1950) / Dec. (1950)	VC memb.	Hubble type	B_T / Source	$\log D_{est}$ / $\log D_{25}$	$\log R_{est}$ / $\log R_{25}$	$v_\odot$ / ϵ	Source	Note
(1)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1121 11°26	12 26.16 11 24.5	M	Im?	16.4: 4	0.95	0.10			
1122 IC 3393 Z	12 26.16 13 11.5	M	dE7,N	14.82 1	1.30 1.13	0.64 0.41	436 29	53	
1123 12°48	12 26.18 12 49.4	M	dE2,N	16.65 3	0.86 0.71	0.12			
1124 11°27	12 26.19 11 08.2	M	dE4	16.3 4	1.03	0.23			
1125 NGC 4452 SA UGC 7601	12 26.19 12 01.9	M	$S0_1(9)$	13.30 1	1.56 1.38	0.70 0.58	152 82	20	
1126 IC 3392 Z UGC 7602	12 26.19 15 16.5	M	Sc/Sa	13.30 1	1.56 1.37	0.40 0.33	1678 28	11	
1127 9°36	12 26.20 9 18.1	M	dE2	18.5 4	0.56	0.12			
1128 9°37	12 26.21 9 19.9	M	ImV:	16.0: 4	0.95	0.10			
1129 13°68	12 26.22 13 05.1	M	dE3	17.69 3	0.49	0.15			
1130 NGC 4453 Z	12 26.23 6 47.3	B	Sc pec	15.68 1	0.80 0.79	0.43 0.33			*
1131 12°49	12 26.24 12 17.8	M	dE3	18.10: 3	0.73	0.18			
1132	12 26.25 16 30.0	M	dE2?	17.2 4	0.77	0.10			
1133	12 26.27 8 30.5	M	dE	19.3 4	0.34				
1134 Z	12 26.28 6 25.4	B	pre merger?	15.1 7	1.16	0.43			
1135	12 26.29 11 12.0	M	dE1,N:	18.4 4	0.58	0.05			
1136 12°50	12 26.29 12 24.5	M	dE1,N:	18.02 3	0.73	0.05			
1137 14°41	12 26.32 14 26.0	M	dE0,N	17.2 4	0.65	0.00			
1138 UGC 7607 Z	12 26.33 4 34.3	-	Sd (on edge)	15.2 6	1.43 1.33	1.18 1.18			
1139	12 26.33 12 13.9	-	?	20.0 4	0.14				
1140	12 26.36 14 40.2	M	dE4	18.5 4	0.65	0.22			
1141	12 26.37 9 42.0	-	BCD?	16.2 4	0.51	0.18			
1142	12 26.38 9 05.5	M	dE	19.0 4	0.26				
1143 13°69	12 26.39 12 58.9	M	dE1:	18.71 3	0.49 0.29	0.05			
1144	12 26.42 15 01.7	M	dE	19.8 4	0.56:				
1145 NGC 4457 SA UGC 7609	12 26.43 3 50.8	-	RSb(rs)II	11.66 1	1.56 1.48	0.00 0.08	868 21	20	
1146 NGC 4458 Z UGC 7610	12 26.43 13 31.1	M	E1	12.92 1	1.28 1.30	0.07 0.02	1951 17	12	
1147	12 26.44 12 13.9	M	dE	20.0 4	0.26				
1148	12 26.44 12 56.2	-	E0	15.7 4	0.43	0.06			
1149 13°70	12 26.44 13 10.9	M	dE3	17.47: 3	0.91	0.15			
1150	12 26.44 15 51.5	M	dE:	20.0 4	0.49:				
1151 7°33	12 26.45 7 48.2	M	dE0,N	16.7 4	0.65	0.00			
1152 Z	12 26.46 8 07.7	B	Sb(r)II	14.82 2	1.03	0.30	7478 28	12	
1153 12°51	12 26.46 12 55.4	M	dE5:	17.8 4	0.65	0.28			
1154 NGC 4459 SA UGC 7614	12 26.48 14 15.3	M	$S0_3(2)$	11.37 1	1.62 1.58	0.11 0.13	1210 16	34	
1155 16°28	12 26.48 16 58.8	M	dE0	18.5 4	0.86	0.00			
1156 DDO 128 Z UGC 7612	12 26.49 2 59.9	-	SBcd(s)II	14.13 1	1.49 1.34	0.28 0.26	1574 7	62	
1157	12 26.51 12 42.7	M	dE3	19.5 4	0.57	0.15			
1158 NGC 4461 SA UGC 7613	12 26.52 13 27.7	M	Sa	12.09 1	1.64 1.57	0.43 0.38	1919 16	34	
1159	12 26.53 5 07.5	M	dE:	19.0 4	0.51				
1160	12 26.54 8 44.0	M	ImIV-V:	18.5 4	0.29				

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ε	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1161		12 26.56	M	dE	19.03	0.42				
		12 18.3			3	0.00:				
1162		12 26.56	M	dE,N	19.8	0.33				
		12 25.9			4					
1163	14°42	12 26.58	M	dE3:	16.4	0.73	0.18			
		14 16.8			4					
1164	9°38	12 26.59	M	dE6,N	16.8	0.95	0.40			
		9 43.1			4					
1165	9°39	12 26.63	M	dE3	18.0	0.51	0.15			
		9 32.6		or ImV	4					
1166	16°29	12 26.65	M	ImV?	17.7	0.95	0.22			
		16 58.2			4					
1167	8°32	12 26.66	M	dE0,N	15.5	0.86	0.00			
		8 09.3			4					
1168		12 26.66	-	ImIII?	17.7	0.73	0.18			
		9 26.1			4					
1169		12 26.67	-	ImIV?	17.8	0.56	0.12			
		17 23.4			4					
1170		12 26.68	M	dE	19.0	0.37				
		11 15.9			4					
1171		12 26.71	M	dE?	19.2	0.22				
		8 31.1			4					
1172	9°40	12 26.71	M	dE5,N	15.5	0.73	0.30			*
Z		9 05.5			4					
1173	13°71	12 26.72	M	dE5,N	16.06	0.80	0.29			
		13 15.3			3	0.90				
1174		12 26.76	-	BCD?	15.5	0.43	0.10			
		10 12.9			4					
1175		12 26.77	M	$E5/S0_1(5)$	15.1	0.86	0.30	70	12	
Z		10 24.8			7			34		
1176		12 26.78	-	?	19.0	0.26				
		8 17.8			4					
1177		12 26.79	M	dE7:	18.7	0.91	0.48			
		12 39.2			4					
1178	NGC 4464	12 26.82	M	E3	13.70	1.10	0.15	1199	13	
Z	UGC 7619	8 26.1			1	1.06	0.10	50		
1179	IC 3412	12 26.82	M	ImIII/BCD	14.87	1.16	0.51	762	77	
Z		10 15.9			2			10		
1180		12 26.83	M	dE4	16.5	1.00	0.20			
		17 05.1			4					
1181		12 26.84	M	dE	20.0	0.41				
		15 20.6			4					
1182	NGC 4465	12 26.85	B	Sc	15.1	0.56	0.30	7368	12	
Z		8 18.2			7			38		
1183	IC 3413	12 26.85	M	dS0(0,5),N	14.32	1.16	0.30	1387	49	
Z	UGC 7620	11 42.5			1	1.21	0.19	21		
1184		12 26.86	M	dE:	19.2	0.34				
		10 13.7			4					
1185	12°52	12 26.86	M	dE1,N	15.56	0.95	0.05			
		12 43.6			3	0.89				
1186	10°36	12 26.88	M	dE0	17.8	0.73	0.00			
		10 31.5		or ImV	4					
1187		12 26.92	M	dE,N:	20.0	0.37				
		9 13.0			4					
1188	IC 796	12 26.92	M	Amorphous	14.23	1.29	0.47	1553	98	
Z	UGC 7623	16 40.8			1	1.16	0.40	8		
1189	IC 3414	12 26.93	M	Sc(s)II	13.70	1.30	0.23	528	56	
Z	UGC 7621	7 02.9			1	1.23	0.20	8		
1190	NGC 4469	12 26.93	M	Sa	12.22	1.73	0.52	508	20	
Z	UGC 7622	9 01.6			1	1.59	0.42	25		
1191	12°53	12 26.95	M	dE4,N	17.42	0.86	0.24			
		12 46.3			3	0.66				
1192	NGC 4467	12 26.96	M	E3	15.05	0.73	0.18	1474	13	
Z		8 16.2			1	0.85	0.08	300		
1193	NGC 4466	12 26.97	M	Sc:	14.62	1.18	0.53	740	91	
Z	UGC 7626	7 58.4			1	1.14	0.46	18		
1194		12 26.97	M	dE0	18.3	0.60	0.00			
		14 26.8			4					
1195		12 26.99	M	dE	19.0	0.45				
		8 06.0		or ImV	4					
1196	NGC 4468	12 26.99	M	S0/a	13.80	1.26	0.22	878	78	
Z	UGC 7628	14 19.5			1	1.18	0.12	19		
1197		12 27.01	M	dE	20.0	0.38				
		9 53.4			4					
1198		12 27.01	-	dE6?	17.7	0.65	0.40			
		13 47.1			4					
1199		12 27.04	-	E2	15.5	0.26	0.10			
		8 20.1			4					
1200	IC 3416	12 27.04	M	ImIII	14.78	1.03	0.18	-123	12	
Z		11 04.2			2			46		

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec.(1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1201		12 27.05 13 36.3	M	dE:	18.8 4	0.56				
1202		12 27.06 13 29.1	-	dE?	20.0 4	0.26				
1203		12 27.08 8 12.6	-	S0:	15.7 4	0.46	0.00			
1204		12 27.09 7 23.0	M	dE7?	16.6 4	1.07	0.64			
1205 Z	NGC 4470 UGC 7627	12 27.09 8 06.0	-	ScIII pec	13.04 1	1.30 1.18	0.20 0.12	2340 5	58	
1206 Z		12 27.09 9 46.5	B	SBc(s)II	14.81 2	0.86	0.06	7300 30	12	
1207	9°41	12 27.09 9 47.8	M	dE0,N	17.2 4	0.56	0.00			
1208 Z		12 27.10 3 53.3	-	SmIII	15.1 7	0.80	0.24	1336 10	10	
1209	10°37	12 27.11 10 39.8	M	dE1:	17.2 4	0.56	0.05			
1210	11°28	12 27.11 11 34.4	M	dE0,N	17.2 4	0.65	0.00			
1211		12 27.12 9 44.3	M	dE	18.6 4	0.21				
1212	11°29	12 27.12 11 54.4	M	dE0,N	16.5: 4	0.95	0.00			
1213	12°55	12 27.12 12 49.4	M	dE0,N	16.2 4	0.80	0.00			
1214		12 27.13 14 20.0	M	dE2	20.0 4	0.48	0.10			
1215		12 27.15 17 14.4	M	dE5	19.4 4	0.73	0.30			
1216	12°54	12 27.16 12 19.2	M	dE4	18.1 4	0.86	0.20			
1217	IC 3418 DDO 130	12 27.19 11 40.7	M	SBmIV	14.0: 4	1.37	0.16			
1218	6°32	12 27.20 6 11.8	M	dE0,N	15.7 4	0.80	0.00			
1219		12 27.20 13 04.8	M	dE4,N	18.21 3	0.37 0.46	0.21			
1220		12 27.20 14 38.6	-	?	19.0 4	0.56	0.30			
1221		12 27.20 17 47.5	-	dE4?,N	18.2 4	0.75	0.19			
1222	15°46	12 27.21 15 18.3	M	dE4,N or dS0(4),N	16.4 4	0.89	0.24			
1223	15°47	12 27.21 15 23.6	M	dE4	16.7 4	1.03	0.08			
1224		12 27.22 17 33.8	M	dE0	17.5 4	0.80	0.00			
1225	7°34	12 27.24 7 14.5	M	dE2,N	17.3 4	0.43	0.10			
1226 SA	NGC 4472 M 49	12 27.24 8 16.7	M	E2/$S0_1$(2)	9.31 1	2.10 1.95	0.10 0.08	969 11	34	
1227	11°30	12 27.24 11 26.5	M	dE0 or ImV	17.4 4	0.91	0.00			
1228	14°43	12 27.24 14 54.5	M	dE5	16.2 4	1.03	0.30			
1229		12 27.26 13 21.2	-	?	19.38 3	0.38				
1230	7°36	12 27.28 7 33.5	M	ImV:	19.5: 4	0.49:				
1231 SA	NGC 4473 UGC 7631	12 27.28 13 42.4	M	E5	11.10 1	1.70 1.65	0.30 0.24	2240 9	34	
1232		12 27.29 11 46.1	-	?	19.0 4	0.26				
1233		12 27.30 4 43.5	-	?	16.8 4	0.43	0.06			
1234		12 27.31 6 20.1	M	dE?	19.5: 4	0.41				
1235	14°44	12 27.31 14 29.6	M	dE6:	18.0 4	0.95	0.40			
1236		12 27.32 6 28.3	M	dE2:	18.4 4	0.51	0.10			
1237		12 27.34 14 08.7	-	?	15.5 4	0.86	0.20			
1238	10°38	12 27.35 10 36.9	M	dE2,N	15.7 4	0.86	0.12			
1239	12°56	12 27.35 12 14.3	M	dE5,N	17.8 4	0.73	0.30			
1240	7°35	12 27.37 7 25.0	M	dE5,N	16.8 4	0.73	0.27			

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec.(1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1241		12 27.37	M	dE0:	19.0:	0.56:	0.00			
		14 14.0			4					
1242	NGC 4474	12 27.37	M	$S0_1(8)$	12.60	1.49	0.33	1610	34	
SA	UGC 7634	14 20.7			1	1.37	0.28	19		
1243	IC 3425	12 27.39	B	Sb(s)I-II	14.31	1.33	0.43	7361	12	
Z	UGC 7633	10 53.3			1	1.35	0.36	36		
1244		12 27.40	-	dE?	18.9	0.43				
		13 29.7			4					
1245		12 27.42	M	dE	18.7	0.43				
		11 03.2			4					
1246	$11^\circ 31$	12 27.43	M	dE0,N	17.5	0.73	0.00			
		11 07.7			4					
1247		12 27.43	M	dE1,N	18.2	0.56	0.05			
		13 32.9			4					
1248		12 27.44	M	dE	18.2	0.71				
		14 44.9			4					
1249	$8^\circ 33$	12 27.47	M	ImIII-IV	14.72	1.26	0.15	468:	10	*
Z	UGC 7636	8 12.4			1	1.10	0.16	(10)		
1250	NGC 4476	12 27.47	M	$S0_3(5)$	13.14	1.33	0.30	1958	34	
SA	UGC 7637	12 37.5			1	1.28	0.17	24		
1251		12 27.48	M	dE	19.81	0.26				
		13 23.5			3	-0.09:				
1252		12 27.49	M	dE0,N	18.8	0.56	0.00			
		9 45.0			4					
1253	NGC 4477	12 27.52	M	$SB0_{1/2}$/SBa	11.31	1.65	0.00	1353	34	
SA	UGC 7638	13 54.7			1	1.60	0.05	11		
1254	$8^\circ 34$	12 27.54	M	dE0,N	15.0	0.82	0.00	1350	2	
		8 21.0			4			29		
1255		12 27.56	M	ImV:	19.0:	0.49:				
		6 37.0			4					
1256		12 27.56	M	dE	19.0	0.31				
		14 11.4			4					
1257		12 27.56	-	Im pec?	16.5	1.23	0.62			
		17 40.6			4					
1258		12 27.57	-	BCD	15.30	0.56	0.12			
Z		16 39.1		or merger	2					
1259	$12^\circ 57$	12 27.58	M	dE5	18.24	0.80	0.34			
		12 39.1			3	0.50				
1260		12 27.62	M	dE	19.5	0.56				
		8 37.7			4					
1261	NGC 4482	12 27.62	M	d:E5,N	13.68	1.37	0.27	1850	78	
Z	IC 3427	11 03.1			1	1.28	0.24	30		
1262		12 27.65	-	BCD?	15.1	0.73	0.18			
Z		3 51.0			7					
1263		12 27.66	M	dE	18.3	0.53				
		10 13.8			4					
1264	$12^\circ 58$	12 27.66	M	dE0,N	16.8	0.70	0.00			
		12 28.2			4					
1265		12 27.67	M	dE0	19.0	0.56	0.00			
		13 58.3			4					
1266	UGC 7642	12 27.68	-	SdmIII-IV	14.63	1.16	0.16	1637	10	
Z		2 54.1			2	1.07	0.08	10		
1267		12 27.68	-	dE?	19.3	0.33				
		7 22.8			4					
1268	$10^\circ 39$	12 27.69	M	dE1,N	16.5	0.88	0.05			
		10 27.6			4					
1269		12 27.70	-	dE5?	18.8	0.43	0.27			
		10 48.3			4					
1270		12 27.73	B	SBa	15.00	0.91	0.35			
Z		8 48.0			2					
1271		12 27.73	M	dE	19.41	0.37				
		12 47.7			3					
1272		12 27.73	M	dE1,N	18.5	0.56	0.07			
		13 35.0			4					
1273	IC 3430	12 27.74	M	ImIII:	15.25	1.16	0.43	2015	12	
Z	UGC 7643	9 21.8			1	1.10	0.54	38		
1274		12 27.74	M	dE:	19.7	0.56:				
		14 59.1			4					
1275		12 27.76	M	dE:	20.0	0.10				
		8 09.7			4					
1276		12 27.76	-	dE?,N	20.0	0.56:				
		14 57.7			4					
1277		12 27.77	M	dE	19.0	0.49				
		12 19.1			4					
1278	$12^\circ 59$	12 27.77	M	dE4	18.3	0.80	0.24			
		12 31.1			4					
1279	NGC 4478	12 27.77	M	E2	12.15	1.33	0.12	1378	34	
SA	UGC 7645	12 36.3			1	1.31	0.06	20		
1280		12 27.77	-	?	19.5	0.56				
		14 24.4			4					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1281		12 27.78	M	dE	19.5	0.41				
		8 10.9			4					
1282		12 27.78	M	dE3	19.7	0.42	0.15			
		12 49.9			4					
1283	NGC 4479	12 27.78	M	$SB0_2(2)$	13.45	1.26	0.00	822	13	
Z	UGC 7646	13 51.2			1	1.26	0.09	100		
1284	UGC 7644	12 27.80	-	Sc	14.44	1.37	0.72			
Z		4 00.8			1	1.35	0.58			
1285		12 27.83	M	dE4	18.5	0.56	0.19			
		14 25.0			4					
1286	$13^\circ 72$	12 27.87	M	dE	18.85	0.47				
		13 04.0			3					
1287	$14^\circ 46$	12 27.87	M	ImV	16.0:	1.03:				
		14 15.5			4					
1288	$15^\circ 48$	12 27.87	M	dE4:	17.9	0.86	0.20			
		15 58.5			4					
1289	$13^\circ 73$	12 27.88	M	dE1	18.5	0.76	0.05			
		13 36.6			4					
1290	NGC 4480	12 27.89	-	Sb(r)II	13.09	1.40	0.27	2439	79	
Z	UGC 7647	4 31.3			1	1.42	0.26	4		
1291	$11^\circ 32$	12 27.90	M	dE2	18.3	0.86	0.12			
		11 42.5			4					
1292		12 27.91	M	dE,N:	18.8	0.34				
		8 27.7			4					
1293	IC 3432	12 27.93	B	Sc	14.64	0.80	0.24	6023	54	
Z		14 26.1			2			18		
1294		12 27.95	-	S0:	16.2	0.97	0.24			
		17 35.2			4					
1295	$10^\circ 40$	12 27.98	-	?	18.3	0.41				
		10 32.2			4					
1296	$6^\circ 33$	12 28.00	M	dE0,N	17.2	0.80	0.00			
		6 48.5			4					
1297	NGC 4486B	12 28.00	M	E1	15.11	0.56	0.05	1486	15	
	I Zw 38	12 46.0			1	0.68	0.03	43		
1298	$13^\circ 74$	12 28.03	M	dE3	17.94	0.65	0.17			
		13 10.6			3	0.46				
1299		12 28.04	M	dE:	19.5	0.22				
		8 15.7			4					
1300		12 28.05	M	dE:	19.28:	0.26				
		12 44.0			3					
1301		12 28.11	M	dE,N:	19.0	0.41				
		13 53.6			4					
1302		12 28.12	M	dE1:,N	18.0	0.68	0.05			
		15 53.0			4					
1303	NGC 4483	12 28.14	M	$SB0_1(5)$	13.17	1.37	0.41	875	18	
Z	UGC 7649	9 17.5			1	1.25	0.22	80		
1304	IC 3435	12 28.15	M	dS0(8),N	15.5	1.26	0.74			
Z	UGC 7650	15 24.2			6	1.10	0.70			
1305		12 28.16	M	dE	19.7	0.43				
		13 55.7			4					
1306		12 28.22	M	dE	19.5	0.33				
		9 17.3			4					
1307		12 28.22	M	dE3,N	18.0	0.43	0.18			
		14 04.5			4					
1308	IC 3437	12 28.24	M	dE6,N	15.1	1.10	0.45	1721	80	
Z		11 37.0			7			45		
1309	$10^\circ 41$	12 28.25	M	dE	19.0	0.49				
		10 25.0			4					
1310		12 28.25	M	dE4?	19.28	0.42	0.22			
		13 29.3			3					
1311	$7^\circ 37$	12 28.26	M	dE1,N	15.6	0.88	0.05			
		7 52.9			4					
1312		12 28.27	M	dE4:	18.7	0.51	0.21			
		11 48.4			4					
1313	RMB 132	12 28.29	M	BCD	16.8	0.49	0.33	1250	15	
		12 19.3			8			30		
1314	$13^\circ 75$	12 28.29	M	dE4:	17.18	0.80	0.24			
		13 29.9			3					
1315	$13^\circ 77$	12 28.29	M	ImV?	19.5:	0.64:				
		13 47.1			4					
1316	NGC 4486	12 28.30	M	E0	9.58	1.95	0.00	1258	34	
SA	M 87	12 40.1			1	1.86	0.03	10		
1317		12 28.31	M	dE2,N	17.98	0.46	0.12			
		13 00.6			3	0.43				
1318	NGC 4488	12 28.32	M	S0 pec(tides)	12.86	1.80	0.46	980	78	
Z	UGC 7653	8 38.2			1	1.56	0.37	32		
1319		12 28.34	M	dE	19.5	0.34				
		14 08.1			4					
1320		12 28.35	M	dE2,N	20.0:	0.65	0.10			
		6 53.1			4					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1321	NGC 4489	12 28.35	M	$S0_1(1)$	12.84	1.30	0.06	930	33	
Z	UGC 7655	17 02.1			1	1.34	0.02	21		
1322		12 28.37	B	RS0?,N	14.8	0.53	0.00	5400	1	
Z		3 46.0			7			300		
1323	15°49	12 28.39	M	dE2:	16.2	1.03	0.08			
		15 03.2			4					
1324	13°78	12 28.41	M	dE2	18.2	0.69	0.10			
		13 37.5			4					
1325	13°76	12 28.41	M	dE	20.0	0.43				
		13 43.5			4					
1326	NGC 4491	12 28.42	M	SBa(s)	13.43	1.33	0.30	497	12	
Z	UGC 7657	11 45.6			1	1.28	0.27	29		
1327	NGC 4486A	12 28.44	M	E2	13.5:	0.95	0.10	450	15	*
Z	UGC 7658	12 32.8			4	1.10	0.04	58		
1328		12 28.44	M	dE	19.3	0.33				
		13 53.8			4					
1329		12 28.45	M	dE5	18.1	0.86	0.30			
		5 50.0			4					
1330	NGC 4492	12 28.45	M	Sa (dust arms)	13.17	1.37	0.00	1787	103	
Z	UGC 7656	8 21.3			1	1.31	0.03	16		
1331	11°33	12 28.47	M	dE3	17.0:	1.02	0.15			
		11 59.0		or ImV	4					
1332	6°34	12 28.48	M	dE	18.3:	0.43				
		6 24.0		or ImV	4					
1333	8°35	12 28.49	M	dE0,N	15.8	0.73	0.00			
		7 59.9			4					
1334	16°30	12 28.49	M	$dS0_3(8)$?	16.0	1.10	0.40			
		16 00.3			4					
1335		12 28.53	M	dE0:	19.8	0.37	0.15			
		12 21.3			4					
1336	12°60	12 28.54	M	dE1	17.0:	0.93	0.05			
		12 06.7		or ImV	4					
1337	15°50	12 28.54	M	dE0:	18.0:	0.91	0.00			
		15 20.8			4					
1338		12 28.55	M	dE2	18.7	0.80	0.10			
		17 39.8			4					
1339		12 28.57	B	$S0_1(9)$ pec	14.9	1.03	0.78			
Z		4 51.8			7					
1340		12 28.65	M	dE0,N	18.26	0.71	0.00			
		13 22.4			3	0.25:				
1341		12 28.67	M	dE3	18.24	0.59	0.15			
		13 23.5			3	0.49				
1342	6°35	12 28.68	M	dE:,N:	19.0	0.56				
		6 56.8			4					
1343		12 28.68	M	dE2,N	18.24	0.61	0.10			
		13 24.0			3	0.37				
1344		12 28.71	-	dE?	20.0	0.50				
		17 13.7			4					
1345	9°42	12 28.72	M	dE:	19.0	0.58				
		9 38.2			4					
1346		12 28.73	-	?	18.5	0.33				
		10 07.1			4					
1347		12 28.74	B	S	15.0	0.64	0.27			
Z		5 21.2			7					
1348	IC 3443	12 28.74	M	dE0,Npec	15.64	0.77	0.00	1645	19	
Z		12 36.5			3			63		
1349		12 28.75	M	dE?	18.5	0.41				
		8 08.3			4					
1350		12 28.77	-	dE?	20.0	0.26				
		14 13.4			4					
1351	14°47	12 28.78	M	dE4	16.0	1.00	0.20			
		14 06.3			4					
1352	12°61	12 28.80	M	dE4:	17.2	0.73	0.22			
		12 53.2			4					
1353	12°62	12 28.80	M	dE2,N	16.49	0.56	0.12			
		13 00.8			3	0.70				
1354		12 28.80	M	dE2	18.5	0.39	0.10			
		13 36.6			4					
1355	IC 3442	12 28.81	M	dE2,N	14.31	1.10	0.15			*
Z	14°48	14 23.5			1	1.18	0.00			
1356	IC 3446	12 28.86	M	SmIII/BCD	14.9	0.95	0.40	1263	91	
Z		11 46.0			7			18		
1357	9°43	12 28.87	M	ImV:	18.9	0.53				
		9 45.1			4					
1358		12 28.87	-	Sa:	16.0	1.05	0.28			
		17 29.0			4					
1359		12 28.88	-	?	18.4	0.56				
		4 17.7			4					
1360		12 28.89	M	dE0,N	18.2	0.43	0.00			
		8 36.6			4					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec.(1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1361	10°42	12 28.91 10 00.5	M	dE6:	17.2 4	0.95	0.40			
1362		12 28.93 3 24.5	-	BCD?	17.2 4	0.56	0.60			
1363		12 28.93 11 12.4	M	dE,N	19.0 4	0.34				
1364		12 28.94 4 14.9	-	dE?,N	19.5 4	0.37				
1365		12 28.97 10 16.9	M	dE:,N:	19.3 4	0.51				
1366		12 28.99 11 52.3	M	dE0,N	17.6 4	0.65	0.00			
1367	9°44	12 29.00 9 14.2	M	ImV?	19.5: 4	0.56:				
1368	NGC 4497	12 29.01	M	SB0(5)/SBa	13.34	1.40	0.37	1123	33	
Z	UGC 7665	11 54.0			1	1.36	0.30	32		
1369	12°63	12 29.02 12 20.4	M	dE6,N	17.3 4	0.80	0.40			
1370	11°35	12 29.07 11 16.5	M	dE0:	17.4 4	0.65	0.00			
1371	14°49	12 29.07 14 05.9	M	dE:	18.2 4	0.73:				
1372		12 29.07 17 00.1	-	dE?,N	19.5 4	0.56				
1373	14°50	12 29.09 14 20.8	M	dE3,N	17.8 4	0.81	0.15			
1374	IC 3453	12 29.09	M	ImIII/BCD	15.16	1.18	0.63	2560	95	
Z	UGC 7666	15 08.2			1	1.09	0.47	9		
1375	NGC 4496A	12 29.11	-	SBcIII-IV	12.0:	1.77	0.10	1730	31	*
SA	UGC 7668	4 12.9			4	1.59	0.10	3		
1376	NGC 4496B	12 29.12	B	Sc:	14.5:	0.95	0.00	4548	10	*
Z		4 12.0			4			10		
1377	11°34	12 29.12 11 06.7	M	ImIV-V:	15.70: 3	1.13	0.15			
1378	6°36	12 29.14 6 03.1	M	dE:	18.2: 4	0.56:				
1379	NGC 4498	12 29.14	M	SBc(s)II	12.62	1.55	0.27	1507	58	
Z	UGC 7669	17 07.8			1	1.51	0.23	4		
1380		12 29.16 5 03.2	M	dE	19.0: 4	0.34				
1381		12 29.20 12 53.3	M	dE	19.0 4	0.51				
1382		12 29.21 10 17.3	-	?	19.5 4	0.26				
1383	9°45	12 29.25 9 21.7	-	?	18.5 4	0.49				
1384	10°43	12 29.25 10 56.7	M	dE2,N	17.10 3	0.78	0.10			
1385		12 29.27 17 06.8	-	dE?,N	19.0 4	0.40				
1386	IC 3457	12 29.32	M	dE3,N	14.43	1.17	0.22	1426:	90	
Z	12°64	12 56.0			1	1.21	0.13	(60)		
1387		12 29.32 13 57.6	M	dE6:	19.2 4	0.57	0.40			
1388		12 29.32 17 14.9	-	Im?	19.0 4	0.56				
1389		12 29.33 12 45.5	M	dE2:,N	15.6 4	0.76	0.10			
1390		12 29.34 14 39.1	M	dE?	20.0 4	0.26				
1391		12 29.35 5 26.9	M	dE	18.5 4	0.49				
1392	IC 3459	12 29.38	M	dSB0(3),N	14.62	1.21	0.15			
Z	12°66	12 27.0		or dE6 pec,N	1	1.10	0.03			
1393	IC 797	12 29.38	-	SBc(s)II-III	14.01	1.23	0.18	2070	104	
Z	UGC 7676	15 24.1			1	1.10	0.16	10		
1394		12 29.39 8 08.9	M	dE6?	19.5 4	0.73	0.36			
1395		12 29.39 8 52.8	-	dE4?,N	16.2 4	0.37	0.21			
1396	12°65	12 29.40 12 14.9	M	dE0:,N:	16.7 4	0.80	0.00			
1397		12 29.44 3 48.9	-	Im?	18.0 4	0.43	0.18			
1398		12 29.44 17 17.2	M	dE0 or ImV	18.5: 4	0.51	0.00			
1399	12°67	12 29.46 12 53.7	M	dE5,N	16.5 4	0.73	0.30			
1400	14°51	12 29.46 14 35.0	M	dE5,N	16.2 4	1.03	0.30			

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1401	NGC 4501	12 29.46	M	Sbc(s)II	10.27	1.95	0.27	2281	37	
SA	M 88	14 41.7			1	1.84	0.25	3		
1402	11°36	12 29.47	M	dE3,N:	18.0	0.57	0.15			
		11 17.6			4					
1403	13°80	12 29.47	M	ImV?	17.5	0.95	0.22			
		13 21.5			4					
1404	8°36	12 29.48	M	dE3	18.1	0.73	0.18			
		8 56.8			4					
1405		12 29.48	M	dE	19.0:	0.56:				
		11 34.5			4					
1406		12 29.50	M	dE	19.6	0.23				
		8 21.1			4					
1407	IC 3461	12 29.51	M	dE2,N	14.82	0.95	0.10	919	12	
Z		12 09.9			2			55		
1408	8°37	12 29.53	M	dE1	18.0	0.56	0.07			
		8 13.2		or ImV	4					
1409	15°51	12 29.54	M	dE1:	19.0	0.60	0.10			
		15 19.8			4					
1410	NGC 4502	12 29.54	M	SmIII	14.57	1.13	0.27	1624	105	
Z	UGC 7677	16 57.8			1	1.13	0.30	7		
1411	IC 3466	12 29.55	M	pec,N	15.72	0.95	0.22	900	104	
Z		12 05.6			3			7		
1412	NGC 4503	12 29.56	M	Sa	12.12	1.73	0.40	1342	34	
SA	UGC 7680	11 27.2			1	1.55	0.30	23		
1413	12°68	12 29.58	M	dE2	17.3	0.91	0.10			
		12 42.6		or ImIV-V	4					
1414	13°81	12 29.60	-	dE4?,N	17.0	0.65	0.22			
		13 07.0			4					
1415		12 29.61	M	dE2,N	19.5	0.56	0.12			
		8 18.9			4					
1416	12°70	12 29.61	-	?	19.0:	0.56				
		12 49.7			4					
1417	15°52	12 29.63	M	dE5:	16.1	0.94	0.30			
		15 34.6			4					
1418	12°69	12 29.65	M	dE3?,N	17.0	0.78	0.15			
		12 47.0			4					
1419	NGC 4506	12 29.65	M	S pec(dust)	13.64	1.43	0.22	737	23	
Z	UGC 7682	13 41.8			1	1.21	0.11	20		
1420	12°71	12 29.67	M	dE4,N	16.2	0.82	0.22	1022	12	
		12 20.3			4			87		
1421	9°46	12 29.68	M	dE,N?	20.0	0.43:				
		9 35.5			4					
1422	IC 3468	12 29.70	M	E1,N:	13.81	1.21	0.11	1372	12	
Z	UGC 7681	10 31.5			1	1.23	0.03	34		
1423		12 29.71	-	BCD?	16.0	0.73	0.30			
		3 16.5			4					
1424		12 29.80	-	?	19.5	0.41				
		10 35.1			4					
1425		12 29.81	M	dE	19.5	0.26				
		10 19.9			4					
1426	12°72	12 29.85	M	ImIV?	15.5	0.95	0.00			
		12 10.2			4					
1427	IC 3471	12 29.85	M	Im/BCD:	15.35	1.03	0.30	-132	10	
Z	16°31	16 17.8			2			10		
1428	II Zw 65	12 29.86	B	S0?	15.38	0.40	0.00			
Z		16 35.1			2					
1429	UGC 7686	12 29.87	B	Sc	15.41	1.10	0.85	7559	76	
Z		12 03.8			1	1.13	0.64	50		
1430		12 29.88	-	dE1?,N	17.2	0.68	0.05			
		5 55.9			4					
1431	IC 3470	12 29.88.	M	dE0,N	14.51	0.80	0.00	2025	5	
Z		11 32.1			2			75		
1432	10°44	12 29.96	M	dE4	16.5	0.86	0.20			
		10 17.6			4					
1433		12 29.96	M	dE:	19.0	0.43				
		14 38.5			4					
1434		12 29.97	M	dE?	20.0	0.33:				
		14 56.9			4					
1435	8°38	12 30.00	M	ImIII-IV	14.63	1.16	0.12	609	12	
Z	UGC 7688	8 19.2			1	1.03	0.00	82		
1436		12 30.01	M	dE2	18.5	0.65	0.10			
		14 07.5			4					
1437		12 30.02	M	BCD	15.7	0.62	0.11	1576	12	
Z		9 26.9			6	0.56	0.00	37		
1438	12°73	12 30.03	M	dE2:	17.7:	1.00:	0.10			
		12 55.5			4					
1439		12 30.04	M	dE:	20.0	0.29				
		8 54.7			4					
1440	IC 798	12 30.04	M	E0	14.92	0.80	0.00	414	12	
Z		15 41.6			2			44		

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec.(1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1441		12 30.05	M	dE4 pec:,N	16.3	0.56	0.22			
		8 22.1			4					
1442	IC 3474	12 30.06	-	Sd (on edge)	14.82	1.56	0.90	1727	14	
Z	UGC 7687	2 56.3			1	1.35	0.93	5		
1443		12 30.06	-	dE3?	17.3	0.60	0.17			
		5 39.8			4					
1444	10°45	12 30.06	M	dE8,N:	15.6	1.16	0.73			
		10 09.7			4					
1445		12 30.08	-	dE?,N	18.42	0.18				
		11 17.2			3	0.31				
1446	10°46	12 30.12	M	dE0,N	15.7	0.80	0.00			
		10 22.0			4					
1447		12 30.12	-	dE?	19.45	0.10				
		11 01.9			3	0.36				
1448	IC 3475	12 30.13	M	ImIV	13.93	1.46	0.10	2572	14	
Z	13°82	13 03.0		or dEl pec	1	1.41	0.02	15		
1449	13°83	12 30.13	M	dE3	18.0	1.00	0.15			
		13 36.2			4					
1450	IC 3476	12 30.18	M	Sc(s)II.2	13.29	1.51	0.11	-225	82	
Z	UGC 7695	14 19.5			1	1.34	0.06	10		
1451	16°32	12 30.18	M	dE5:,N	16.2	0.88	0.32			
		16 11.4			4					
1452		12 30.19	M	dE	19.5	0.43				
		14 37.7			4					
1453	IC 3478	12 30.21	M	dE2,N	14.34	1.21	0.11	1949	54	
Z	UGC 7696	14 28.2			1	1.10	0.04	26		
1454	11°37	12 30.22	M	dE0,N	18.69	0.65	0.00			
		11 13.4			3					
1455		12 30.24	M	ImIV	16.8	0.91	0.40	1340	10	
		8 04.5			4			10		
1456		12 30.28	-	Sbc(s)II	14.74	1.21	0.26			
Z		3 34.5			2					
1457		12 30.29	-	dE4 pec?,N	16.0	0.73	0.25			
		3 04.4			4					
1458		12 30.30	B	SBbcI	15.33	0.95	0.15			
Z		6 04.5			2					
1459		12 30.31	-	BCD:	16.3	0.73	0.27			
		2 54.3			4					
1460		12 30.33	-	BCD?	16.5	0.80	0.46			
		3 27.4			4					
1461		12 30.33	M	dE	19.3	0.34				
		11 34.3			4					
1462	IC 3481	12 30.35	B	E2 pec(tides)	14.8	1.10	0.10	7086	15	
Z		11 40.0			6	0.82	0.13	80		
1463		12 30.36	M	dE3	18.5	0.54	0.22			
		13 05.4			4					
1464	11°38	12 30.37	M	dE4	17.72	0.82	0.22			
		11 27.9			3	0.56				
1465		12 30.38	-	ImIV	15.0:	0.95	0.05	734	10	
		3 38.1			4			10		
1466		12 30.38	M	dE?	19.5	0.34				
		12 54.7			4					
1467		12 30.40	M	dE2,N:	18.8	0.45	0.10			
		14 09.9			4					
1468		12 30.41	-	ImIV	15.0	1.10	0.24			
		4 51.2			4					
1469		12 30.45	-	dE2?	19.5	0.58	0.10			
		15 17.7			4					
1470		12 30.47	M	dE:	20.0	0.26				
		10 24.2			4					
1471		12 30.50	-	BCD	16.5	0.95	0.52			
		11 25.5		or merger	4					
1472	10°47	12 30.55	M	dE2	17.5	0.65	0.10			
		10 15.6			4					
1473		12 30.55	M	dEl:	18.3	0.51	0.05			
		13 49.1			4					
1474		12 30.56	M	dE2	19.0	0.45	0.10			
		13 26.3			4					
1475	NGC 4515	12 30.57	M	E2	13.36	1.10	0.15	940	11	
Z	UGC 7701	16 32.5			1	1.20	0.07	52		
1476	IC 3484	12 30.57	B	Sc(s)I	14.89	0.92	0.16	8045	12	
Z		17 40.8			2			32		
1477		12 30.58	M	dE2,N	19.0	0.65	0.10			
		13 34.9			4					
1478	15°53	12 30.58	-	dE6 pec	18.3	0.73	0.40			
		15 47.1			4					
1479	NGC 4516	12 30.61	M	$SB0_{2/3}(5)$	13.67	1.43	0.33	958	11	
Z	UGC 7703	14 51.0			1	1.27	0.23	40		
1480		12 30.62	B	Sb(r)	14.94	0.95	0.62	6061	12	
Z		8 06.7			2			34		

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1481	11°39	12 30.62	M	dE4,N	17.39:	0.60	0.22			
		11 06.6			3					
1482	12°74	12 30.62	M	dE2	18.0	0.69	0.10			
		12 33.6			4					
1483		12 30.63	-	ImIV?	16.5	0.86	0.06			
		9 31.9			4					
1484	NGC 4518	12 30.65	B	$SB0_{2/3}(r)/a$	14.48	1.10	0.37	6544	12	
Z		8 07.7			2			32		
1485		12 30.65	M	dE	19.0	0.45				
		9 23.3			4					
1486	IC 3483	12 30.65	M	S pec,N	15.3	0.95	0.15	108	15	
Z		11 37.2			6	0.67	0.10	40		
1487		12 30.67	M	dE	19.5:	0.41				
		8 39.3			4					
1488	IC 3487	12 30.69	M	E6:	14.76	1.03	0.38	1157	12	
Z		9 40.5			2			48		
1489	IC 3490	12 30.70	M	dE5,N?	15.89	0.95	0.30	80	21	
Z	11°40	11 12.1			3	0.94		50		
1490	IC 3489	12 30.71	B	Sbc(r)I	14.68	0.73	0.00	7833	83	
Z		12 31.5			2			22		
1491		12 30.71	M	dE2,N	14.8	0.86	0.12	1903	19	
		13 07.9			4			42		
1492		12 30.75	-	dE2?	18.3	0.51	0.08			
		2 19.3			4					
1493		12 30.75	M	dE5,N:	19.5	0.56	0.30			
		12 51.4			4					
1494		12 30.76	M	dE	19.0	0.40				
		12 33.3			4					
1495	14°53	12 30.77	M	dE0,N	17.6	0.65	0.00			
		14 12.6			4					
1496	9°47	12 30.79	M	dE5,N:	17.5	0.73	0.30			
		9 23.8			4					
1497		12 30.79	M	dE4,N	15.7	1.03	0.23			
		17 44.2			4					
1498		12 30.80	M	dE2,N	17.3	0.43	0.10			
		8 07.9			4					
1499	IC 3492	12 30.81	M	E3 pec	14.58	0.80	0.15	-575	53	
Z		13 07.6		or S0	2			35		
1500		12 30.84	M	dE	19.2	0.34				
		11 54.9			4					
1501	NGC 4519A	12 30.88	M	dS0?	15.10	0.86	0.49	1434	12	
Z		8 58.0			2			49		
1502	13°84	12 30.89	M	dE3	18.5	0.87	0.15			
		13 41.5			4					
1503		12 30.90	M	dE4,N	15.5	1.00	0.20			
		6 53.6			4					
1504		12 30.90	B	Sc	15.0	0.56	0.22	7270	12	*
Z		13 30.4			4			38		
1505	15°54	12 30.90	M	dE7?	18.0	0.95	0.55			
		15 41.1			4					
1506		12 30.92	M	dE	18.3	0.56				
		8 07.8			4					
1507		12 30.94	-	SmIV:	15.08	1.16	0.30			
Z		4 04.2			2					
1508	NGC 4519	12 30.96	M	SBc(rs)II.2	12.34	1.65	0.14	1220	31	*
SA	UGC 7709	8 55.8			1	1.49	0.14	5		
1509	9°48	12 30.99	M	dE0,N	16.8	0.65	0.00			
		9 44.2			4					
1510		12 30.99	M	Im?	18.3	0.83	0.10			
		16 34.2			4					
1511	13°85	12 31.03	M	dE0?	18.2	0.60	0.00			
		13 45.3			4					
1512	11°41	12 31.05	M	dS0 pec	15.73	0.86	0.12	762	19	
		11 32.1			3	0.84		35		
1513		12 31.07	M	dE	19.0:	0.43:				
		16 34.6			4					
1514		12 31.08	M	dE7,N	15.1	1.26	0.60	538:	12	
		8 08.3			4			(72)		
1515		12 31.13	-	?	17.0	0.80	0.07			
		3 57.1			4					
1516	NGC 4522	12 31.13	M	Sc/Sb:	12.73	1.70	0.60	2328	31	
SA	UGC 7711	9 27.0			1	1.57	0.51	5		
1517		12 31.14	M	dE3,N	17.3	0.84	0.15			
		12 50.9			4					
1518		12 31.15	M	dE1	18.0	0.67	0.05			
		12 39.6			4					
1519	8°39	12 31.16	M	dE0,N	17.2	0.73	0.00			
		8 03.6			4					
1520		12 31.18	M	dE:	20.0	0.29				
		11 03.8			4					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1521	IC 3499	12 31.23	M	E7/S0$_1$(7)	14.21	1.37	0.51	1212	78	
Z	UGC 7712	11 16.1			1	1.21	0.43	23		
1522		12 31.24	M	dE,N	18.7	0.49				
		12 03.3			4					
1523	13°86	12 31.27	M	dE0,N	17.5	0.56	0.00			
		13 03.4			4					
1524	NGC 4523	12 31.29	M	SBd(s)III	13.62	1.60	0.04	262	62	
Z	DDO 135	15 26.6			1	1.42	0.02	4		
1525		12 31.31	B	Sbc(r)II	14.81	0.73	0.00	11381	12	
Z		8 18.1			2			42		
1526	IC 3500	12 31.31	B	SBc	14.9	0.95	0.22	6163	15	
Z		14 14.5			7			20		
1527		12 31.32	-	dE?	19.82	0.21				
		11 15.7			3	0.00				
1528	IC 3501	12 31.33	M	d:El	14.51	0.91	0.05	1608	12	
Z		13 35.9			2			35		
1529	UGC 7715	12 31.37	-	SdmIII-IV	14.63	1.16	0.09	1138	9	
Z		3 49.4			1	1.03	0.00	10		
1530		12 31.39	M	dE2,N	18.3	0.60	0.10			
		5 59.7			4					
1531		12 31.41	M	dE0,N	17.40	0.51	0.00			
		10 51.2			3	0.50				
1532	IC 800	12 31.43	-	SBc pec	14.05	1.37	0.14	2318	106	
Z	UGC 7716	15 37.9			1	1.22	0.12	15		
1533	6°37	12 31.48	M	dE2,N	18.0:	0.78	0.10			
		6 13.7			4					
1534		12 31.48	M	dE0	18.2	0.51	0.00			
		6 55.3			4					
1535	NGC 4526	12 31.51	M	S0$_3$(6)	10.61	1.91	0.54	533	34	
SA	UGC 7718	7 58.5			1	1.86	0.49	12		
1536	12°75	12 31.56	M	dE3,N	18.4	0.74	0.15			
		12 06.7			4					
1537	NGC 4528	12 31.57	M	SB0$_2$(5)	12.70	1.33	0.38	1374	33	
Z	UGC 7722	11 35.8			1	1.26	0.19	21		
1538		12 31.58	M	dE	19.4	0.43				
		11 19.7			4					
1539	13°87	12 31.58	M	dE0,N	15.4	0.95	0.00			
		13 01.2			4					
1540	NGC 4527	12 31.59	-	Sb(s)II	11.32	1.86	0.49	1738	20	
SA	UGC 7721	2 55.7			1	1.80	0.44	8		
1541		12 31.62	-	?	20.0	0.26				
		13 01.0			4					
1542	IC 3505	12 31.65	B	SBc	14.91	1.07	0.47	13907	12	
Z		16 15.0			2			40		
1543	16°33	12 31.65	M	dEl	18.0	0.88	0.05			
		16 59.2			4					
1544		12 31.67	-	BCD	17.0	0.80	0.37			
		12 05.0		or merger	4					
1545	IC 3509	12 31.67	M	E4	14.75	1.10	0.19	2050	49	
Z		12 19.6			2			32		
1546		12 31.67	M	dE?	19.5	0.41				
		13 51.0			4					
1547		12 31.69	-	dE3	18.2	0.43	0.18			
		2 34.3			4					
1548		12 31.69	-	dE6?	18.59	0.33	0.38			
		11 45.5			3	0.46				
1549	IC 3510	12 31.72	M	dE3,N	14.63	0.95	0.15	1357	90	
Z	UGC 7728	11 20.8			1	1.07	0.12	37		
1550		12 31.73	-	ImV?	18.5	0.45				
		4 00.6			4					
1551		12 31.73	M	dE	18.5:	0.64:				
		11 44.3			4					
1552	NGC 4531	12 31.74	M	Sa pec	12.58	1.72	0.24	195	9	
Z	UGC 7729	13 21.1			1	1.47	0.16	13		
1553	16°34	12 31.75	M	dEl:	16.8	0.93	0.00			
		16 20.3			4					
1554	NGC 4532	12 31.78	M	SmIII	12.30	1.51	0.41	2012	31	
SA	UGC 7726	6 44.7			1	1.46	0.36	4		
1555	NGC 4535	12 31.80	M	SBc(s)I.3	10.51	1.95	0.05	1961	31	
SA	UGC 7727	8 28.6			1	1.83	0.13	3		
1556		12 31.80	M	dE	19.3	0.41				
		14 44.9			4					
1557	NGC 4533	12 31.81	-	Scd (on edge)	14.53	1.51	0.78			
Z	UGC 7725	2 36.1			1	1.30	0.67			
1558		12 31.82	M	ImV?	18.83:	0.43				
		11 41.5			3					
1559		12 31.86	-	dE	19.5	0.26				
		2 36.4			4					
1560		12 31.86	-	?	20.03	0.26				
		11 14.2			3					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1561	13°88	12 31.87	M	dE0,N:	15.3:	1.03	0.00			
		13 10.7			4					
1562	NGC 4536	12 31.90	-	Sc(s)I	11.01	1.95	0.34	1809	20	
SA	UGC 7732	2 27.7			1	1.87	0.33	6		
1563	12°76	12 31.91	M	dE3,N	16.0	1.02	0.15			
		12 11.7			4					
1564		12 31.91	M	dE:	20.0	0.43				
		15 43.3			4					
1565	12°77	12 31.96	M	dE0,N	16.91	0.73	0.00			
		12 00.6			3	0.61				
1566	IC 3517	12 31.98	M	SdIV	14.51	1.16	0.20	437	107	
Z	9°49	9 25.9			1	1.19	0.20	9		
1567	IC 3518	12 31.98	M	dE5,N	14.64	1.16	0.36	1440	12	
Z	9°50	9 54.0		or dS0(5),N	1	1.13	0.19	55		
1568		12 32.00	B	Sb	15.0	0.60	0.26			
Z		6 16.9			7					
1569	IC 3520	12 32.00	M	Scd:	15.0	1.13	0.18	799	23	
Z		13 46.9			7			20		
1570		12 32.02	-	E3	16.0	0.73	0.18			
		16 18.4			4					
1571		12 32.02	-	dE4?	15.8	0.65	0.22			
		16 18.8			4					
1572		12 32.03	-	BCD	16.0	0.86	0.49			
		2 50.7			4					
1573	10°48	12 32.03	M	dE4	16.57	0.80	0.20			
		10 49.5			3	0.75				
1574		12 32.03	-	?	17.3	0.73	0.13			
		15 27.4			4					
1575	IC 3521	12 32.11	M	SBm pec	13.98	1.10	0.15	594	51	
Z	UGC 7736	7 26.2			1	1.07	0.12	10		
1576	NGC 4538	12 32.13	B	S pec	14.4	1.03	0.38	5100	1	
Z		3 35.9			7			300		
1577	15°55	12 32.13	M	dE4	15.8	0.95	0.22			
		15 52.8			4					
1578		12 32.16	M	dE:	19.70:	0.33				
		11 25.1			3	-0.09:				
1579		12 32.18	B	S0:	14.87	0.65	0.17	12861	12	
Z		9 16.7			2			34		
1580		12 32.19	M	dE	18.8	0.49				
		8 22.0			4					
1581	6°38	12 32.20	M	SmIV	14.55	1.12	0.10	2048	46	*
Z	DDO 137	6 34.7			1	1.12	0.01	7		
1582	14°54	12 32.20	M	ImV	16.5	1.03	0.08			
		14 30.0		or dE2	4					
1583		12 32.23	-	BCD?	16.5	0.33	0.30			
		3 17.0			4					
1584	16°35	12 32.24	M	dE0,N	18.2	0.64	0.00			
		16 18.4			4					
1585	IC 3522	12 32.25	M	ImIII-IV pec	15.2	1.32	0.30	662	99	
	DDO 136	15 29.8			8			8		
1586		12 32.26	M	dE:	19.3	0.43				
		14 34.1			4					
1587	7°38	12 32.28	-	dE?	18.5	0.29				
		7 06.8			4					
1588	NGC 4540	12 32.32	M	Scd(s)III-IV	12.49	1.51	0.14	1286	31	
SA	UGC 7742	15 49.9			1	1.30	0.09	4		
1589		12 32.36	M	dE3:,N:	19.0	0.43	0.18			
		8 26.1			4					
1590		12 32.40	M	dE	20.0	0.49				
		14 55.5			4					
1591		12 32.41	M	dE,N:	19.5	0.43				
		10 20.2			4					
1592		12 32.42	-	?	18.7	0.34				
		10 24.4			4					
1593	IC 3528	12 32.42	B	Sbc	15.25	0.73	0.00	13780	54	
Z		15 50.6			1	0.81	0.04	17		
1594		12 32.46	M	dE3	18.73	0.43	0.18			
		11 37.1			3	0.36				
1595		12 32.46	M	dE2:	18.38	0.60	0.10			
		11 49.3			3					
1596		12 32.48	M	ImIII-IV:	17.2	0.65	0.32			
		9 27.8			4					
1597		12 32.50	B	Sc (on edge)	15.2	1.07	0.81			
Z		5 42.1			7					
1598		12 32.55	B	SBb(s)I-II	15.1	0.80	0.15			
Z		6 09.1			7					
1599	12°78	12 32.57	M	dE3:	17.3	0.81	0.15			
		12 10.8			4					
1600		12 32.59	-	dE?	19.0	0.36				
		10 47.2			4					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec.(1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1601	13°90	12 32.60	M	dE3:	18.0	0.48	0.15			
		13 14.6			4					
1602	13°89	12 32.61	M	dE7:	18.2	0.80	0.54			
		13 45.7			4					
1603		12 32.61	M	dE4,N	18.0	0.76	0.22			
		13 50.4			4					
1604	14°55	12 32.65	M	dE6,N	16.7	1.04	0.40			
		14 15.7			4					
1605	10°49	12 32.71	-	S:	17.0	1.10	0.94			
		10 42.4			4					
1606	12°79	12 32.71	M	dE3,N	17.5	0.72	0.15			
		12 30.9			4					
1607		12 32.75	B	S0(8)	14.9	0.95	0.70			
Z		6 49.4			7					
1608	NGC 4543	12 32.79	-	E3	14.2	0.91	0.18			
Z		6 23.5			7					
1609	11°42	12 32.80	M	dE2,N	17.37	0.78	0.10			
		11 54.8			3	0.52				
1610		12 32.83	-	dE	19.0:	0.38				
		4 12.7		or ImV	4					
1611		12 32.86	M	dE	19.5	0.41				
		6 46.8			4					
1612		12 32.88	M	dE1:	18.5	0.36	0.05			
		14 02.5			4					
1613		12 32.92	M	dE:	18.5	0.38				
		12 48.3			4					
1614	IC 3540	12 32.92	M	$S0_3(2)$	14.14	0.91	0.09	753	49	
Z		13 01.5			2			35		
1615	NGC 4548	12 32.92	M	SBb(rs)I-II	10.98	1.87	0.08	486	34	
SA	UGC 7753	14 46.4			1	1.73	0.09	8		
1616	14°56	12 32.95	M	dE5,N	16.2	0.86	0.30			
		14 32.2			4					
1617		12 32.97	-	d:S0(4) pec?	15.0	0.95	0.15			
Z		6 36.7			7					
1618		12 32.98	M	dE2	18.3	0.56	0.10			
		7 18.2			4					
1619	NGC 4550	12 32.98	M	$E7/S0_1(7)$	12.50	1.69	0.65	378	20	
SA	UGC 7757	12 29.8			1	1.54	0.51	14		
1620		12 33.01	-	?	20.0	0.34				
		7 48.8			4					
1621		12 33.02	M	dE2:	18.37:	0.56	0.10			
		12 03.8			3					
1622	16°36	12 33.02	M	dE3	17.9	0.95	0.18			
		16 19.6			4					
1623	16°37	12 33.02	-	?	16.7	0.73	0.18			
		16 53.3			4					
1624	NGC 4544	12 33.05	-	Sc (on edge)	13.89	1.49	0.69	1129	32	
Z	UGC 7756	3 18.6			1	1.33	0.42	13		
1625	11°43	12 33.05	M	dE:	18.3:	0.86				
		11 53.8			4					
1626		12 33.05	M	dE	19.0	0.45				
		12 14.2			4					
1627		12 33.09	M	E0	15.5	0.43	0.00	249	12	
		12 39.5			4			71		
1628		12 33.09	M	dE3	19.0	0.72	0.15			
		17 32.7			4					
1629	9°51	12 33.10	M	dE4	17.4	0.65	0.22			
		9 52.0			4					
1630	NGC 4551	12 33.11	M	E2	12.85	1.40	0.10	1197	67	
Z	UGC 7759	12 32.4			1	1.30	0.09	15		
1631		12 33.11	M	dE	20.0	0.43				
		12 37.2			4					
1632	NGC 4552	12 33.13	M	$S0_1(0)$	10.78	1.95	0.00	321	34	
SA	M 89	12 50.0			1	1.62	0.00	12		
1633		12 33.15	B	SBb(s)I	15.62	0.73	0.18			
Z		11 56.5			3					
1634		12 33.16	M	dE:	20.0	0.37:				
		12 29.2			4					
1635		12 33.16	M	dE?	20.0:	0.26:				
		12 30.8			4					
1636		12 33.22	B	Sb(r)II	15.13	1.03	0.30			
Z		14 41.3			2					
1637		12 33.23	M	dE0,N	18.5	0.60	0.00			
		12 27.5			4					
1638		12 33.25	B	Sc(s)I	15.2	0.73	0.08			
Z		3 28.6			7					
1639		12 33.27	M	dE4	19.0	0.80	0.22			
		16 15.7			4					
1640		12 33.29	-	dE?	19.0	0.16				
		9 37.2			4					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1641		12 33.30	-	?	19.0	0.34				
		13 05.4			4					
1642	11°45	12 33.34	M	dE2,N	17.8	0.70	0.10			
		11 57.6			4					
1643		12 33.35	-	dE4,N	15.2	0.80	0.24			
Z		6 02.2		or S0	7					
1644		12 33.35	M	SmIV	17.5	1.09	0.75			
		14 08.0			4					
1645		12 33.37	-	dE1:	18.0	0.51	0.05			
		2 45.7			4					
1646	6°39	12 33.42	-	dE?	19.5:	0.64:				
		6 04.0			4					
1647	11°44	12 33.42	M	dE4	16.0	0.91	0.22			
		11 12.9			4					
1648		12 33.50	M	dE:	20.0	0.33:				
		6 41.1			4					
1649	7°39	12 33.50	M	dE3,N:	15.7	0.86	0.15			
		7 28.6			4					
1650	13°91	12 33.52	M	dE6	17.4	0.97	0.40			
		13 45.6			4					
1651	6°40	12 33.58	M	dE5	17.0:	0.99	0.30			
		6 19.8			4					
1652	7°40	12 33.59	M	dE4	17.3	0.73	0.22			
		7 52.4			4					
1653		12 33.63	B	$S0_{1/2}(7)$	15.2	0.73	0.40			
Z		5 21.7			7					
1654	IC 3562	12 33.64	M	ImIII	15.04	1.03	0.48	2050		95
Z		10 11.9			2			10		
1655	9°52	12 33.70	M	dE:	19.0	0.41				
		9 44.9			4					
1656	14°57	12 33.72	M	dE3	17.1	0.95	0.17			
		14 56.7		or ImIV-V	4					
1657		12 33.74	M	dE5	17.7	0.43	0.27			
		10 52.6			4					
1658	13°92	12 33.77	M	dE4	17.0	0.93	0.22			
		13 51.2			4					
1659		12 33.82	M	dE	19.0	0.34				
		8 33.9			4					
1660	IC 3567	12 33.85	B	Sbc(s)II	14.9	1.07	0.07	9233		12
Z		13 52.8			7			32		
1661	10°50	12 33.87	M	dE0,N	15.7	0.95	0.00			
		10 39.5			4					
1662		12 33.89	M	dE,N:	20.0	0.38				
		13 46.1			4					
1663	12°82	12 33.91	M	dE2	17.5	0.89	0.10			
		12 10.2			4					
1664	NGC 4564	12 33.92	M	E6	12.02	1.73	0.52	1111		34
SA	UGC 7773	11 42.9			1	1.49	0.35	18		
1665		12 33.93	-	E4	15.3	0.76	0.20			
		12 40.8			4					
1666		12 33.95	-	dE?	19.5	0.26				
		8 47.2			4					
1667	16°38	12 33.95	-	dE3 pec?	17.3	0.90	0.17			
		16 48.8			4					
1668	13°93	12 33.98	-	dS0:	18.0	1.09	0.52			
		13 49.2			4					
1669	13°95	12 33.99	M	dE6,N	16.2	1.07	0.52			
		13 54.8			4					
1670		12 33.99	M	dE	20.0	0.26				
		14 13.2			4					
1671		12 34.00	-	$d:S0_{1/2}$	14.8	0.91	0.31			
Z		6 26.9			7					
1672		12 34.01	M	dE,N	19.0:	0.73:				
		12 47.5			4					
1673	NGC 4567	12 34.02	M	Sc(s)II-III	12.08	1.56	0.19	2274		37
SA	UGC 7777	11 32.0			1	1.47	0.15	3		
1674	14°58	12 34.02	M	dE3,N	16.3	0.92	0.15			
		14 01.3			4					
1675		12 34.04	M	pec	14.47	1.03	0.23	1795		10
Z		8 19.8			2			10		
1676	NGC 4568	12 34.04	M	Sc(s)III	11.70	1.80	0.46	2255		37
SA	UGC 7776	11 30.9			1	1.66	0.33	3		
1677	13°94	12 34.06	M	dE1,N	16.8	0.79	0.05			
		13 52.4			4					
1678	IC 3576	12 34.08	M	SBdIV	13.70	1.43	0.06	1077		10
Z	6°41	6 53.8			1	1.39	0.02	10		
1679		12 34.08	-	dE?	18.7	0.26				
		10 42.3			4					
1680		12 34.09	M	dE:	19.49:	0.33				
		11 16.3			3					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1681		12 34.10	M	dE0,N	18.2	0.49	0.00			
		11 25.9			4					
1682	14°59	12 34.10	M	dE4:	17.8	0.60	0.22			
		14 30.1			4					
1683	11°46	12 34.11	M	dE2,N	17.0:	0.86	0.12			
		11 13.0			4					
1684	IC 3578	12 34.13	M	dS0(8):	14.87	1.10	0.54	694	12	
Z	UGC 7782	11 22.7			1	1.03	0.27	67		
1685	UGC 7780	12 34.15	-	SBd (on edge)	15.18	1.43	0.78			
Z		3 22.9			1	1.24	0.67			
1686	IC 3583	12 34.21	M	SmIII	13.91	1.54	0.21	1120	84	
Z	UGC 7784	13 32.0			1	1.32	0.28	10		
1687		12 34.27	-	dE3,N	15.1	0.95	0.15			
Z		4 22.7			7					
1688	15°56	12 34.29	M	dE4	16.3	0.75	0.19			
		15 00.7			4					
1689	12°83	12 34.31	M	dE2	17.0	0.86	0.12			
		12 38.3			4					
1690	NGC 4569	12 34.31	M	Sab(s)I-II	10.25	2.12	0.30	-241	85	
SA	M 90	13 26.4			1	1.98	0.31	7		
1691	13°96	12 34.32	M	dS0(9):	17.3	1.03	0.88			
		13 14.3			4					
1692	NGC 4570	12 34.35	M	$S0_1(7)/E7$	11.82	1.64	0.64	1730	20	
SA	UGC 7785	7 31.4			1	1.61	0.50	75		
1693		12 34.35	M	dE0	19.2	0.56	0.00			
		13 33.8			4					
1694		12 34.36	M	dE3:	19.3	0.48	0.15			
		14 02.6			4					
1695	IC 3586	12 34.38	M	dS0:	14.6	1.21	0.00	1547	49	
Z	12°84	12 48.0			7			29		
1696	NGC 4571	12 34.42	M	Sc(s)II-III	11.81	1.67	0.03	342	31	
SA	UGC 7788	14 29.8			1	1.58	0.05	3		
1697		12 34.47	-	?	18.2	0.65	0.10			
		6 23.1			4					
1698	16°39	12 34.47	M	dE6	15.8	1.21	0.35			
		16 33.6			4					
1699	IC 3589	12 34.50	M	SBmIII	14.11	1.16	0.27	1632	50	*
Z	UGC 7790	7 12.3			2			5		
1700		12 34.51	M	dE	19.0	0.54:				
		11 45.4			4					
1701		12 34.57	B	S0	15.3	0.84	0.24			
Z		5 41.8			7					
1702	14°60	12 34.61	M	dE4:	17.7	0.91	0.22			
		14 15.4			4					
1703		12 34.62	-	?	19.0	0.19				
		8 40.0			4					
1704	10°51	12 34.63	M	dE6	16.0	1.00	0.36			
		10 32.9			4					
1705	9°53	12 34.64	M	dE,N	18.7	0.63				
		9 45.8			4					
1706		12 34.65	M	dE	20.0	0.34				
		12 43.4			4					
1707		12 34.72	M	dE:	19.0	0.38				
		10 59.7			4					
1708		12 34.74	-	dE?	20.0	0.38				
		9 41.0			4					
1709		12 34.79	-	?	19.5	0.41				
		10 50.7			4					
1710		12 34.79	-	dE2?	17.80	0.62	0.11			
		11 09.9			3					
1711	12°85	12 34.83	M	dE3,N	16.0	0.98	0.15			
		12 33.9			4					
1712		12 34.85	-	dE?	19.5	0.29				
		10 14.5			4					
1713		12 34.9	-	?	15.08	0.73	0.22			*
Z		5 01			2					
1714	14°61	12 34.91	M	dE4,N	18.5	0.76	0.22			
		14 35.3			4					
1715	9°54	12 34.93	-	dE0 pec?	16.2	0.56	0.00			
		9 04.2			4					
1716		12 34.93	M	dE	19.0	0.43:				
		15 25.4			4					
1717	12°86	12 34.96	M	dE7	16.1	1.23	0.52			
		12 37.8			4					
1718		12 34.97	M	dE2:,N	18.3	0.73	0.10			
		11 45.3			4					
1719	9°55	12 34.98	M	dE0	18.0	0.56	0.00			
		9 46.9			4					
1720	NGC 4578	12 34.98	M	$S0_{1/2}(4)$	12.22	1.67	0.16	2284	34	
SA	UGC 7793	9 49.8			1	1.56	0.12	14		

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1721	NGC 4576	12 35.01	-	Sb	14.22	1.16	0.20			*
Z	UGC 7792	4 38.6			1	1.15	0.16			
1722		12 35.04	M	dE	18.7	0.41				
		8 45.4			4					
1723		12 35.07	M	dE,N	20.0	0.49:				
		9 28.9			4					
1724	7°42	12 35.14	M	dE	18.5	0.65				
		7 57.1			4					
1725		12 35.15	M	SmIII/BCD	14.51	1.16	0.20	1065	51	
Z		8 50.0			2			10		
1726	7°43	12 35.20	M	SdmIV	14.54	1.21	0.11	62	10	
Z	DDO 139	7 22.7			1	1.14	0.10	10		
1727	NGC 4579	12 35.20	M	Sab(s)II	10.56	1.89	0.11	1567	34	
SA	M 58	12 05.6			1	1.73	0.09	17		
1728	10°52	12 35.23	M	ImIV:	16.7	0.80	0.15			
		10 15.7			4					
1729		12 35.25	M	dE5?	17.8	0.83	0.30			
		11 15.5			4					
1730	NGC 4580	12 35.27	M	Sc/Sa	12.61	1.43	0.13	1033	37	
SA	UGC 7794	5 38.6			1	1.38	0.11	20		
1731	13°97	12 35.30	M	dE5	18.5:	0.73	0.30			
		13 42.8			4					
1732	16°40	12 35.31	M	dE0:	18.2	0.65	0.00			
		16 00.1			4					
1733		12 35.34	M	dE3	18.0:	0.72	0.15			
		14 44.6			4					
1734		12 35.35	-	dE:	20.0	0.49				
		2 25.5			4					
1735		12 35.35	-	dE	19.5:	0.34				
		2 27.4			4					
1736	11°47	12 35.37	M	dE0?	19.0	0.64	0.00			
		11 25.2			4					
1737		12 35.37	B	E2	14.8	0.65	0.10	9174	12	*
Z		14 33.4			7			34		
1738	15°57	12 35.40	M	dE0	18.7	0.56	0.00			
		15 26.0			4					
1739	6°42	12 35.41	M	dE?	18.7	0.34				
		6 49.1			4					
1740	14°62	12 35.49	M	dE0:	18.0	0.73	0.00			
		14 27.2			4					
1741		12 35.50	-	dE?	18.4	0.41				
		2 38.7			4					
1742		12 35.53	M	dE:	19.0	0.58				
		9 47.9			4					
1743	IC 3602	12 35.58	M	dE6	15.1	1.11	0.52			
Z	10°53	10 21.5			7					
1744		12 35.58	-	BCD?	17.5	0.56	0.19			
		10 26.4			4					
1745	16°41	12 35.59	M	dE2	17.9	0.68	0.10			
		16 20.9			4					
1746		12 35.64	M	dE	19.5	0.56				
		12 20.3			4					
1747	13°98	12 35.64	M	dE5:	18.2	0.86	0.30			
		13 51.3			4					
1748		12 35.66	B	SBa(s)	15.79	0.86	0.49	11333	12	*
Z		8 05.2			2			32		
1749		12 35.68	M	dE,N	19.5	0.56				
		10 58.5			4					
1750		12 35.71	-	BCD?	16.5	0.33	0.30			
		7 16.2			4					
1751	15°59	12 35.71	M	dE3	18.4	0.70	0.15			
		15 38.9			4					
1752		12 35.73	B	SBb	15.56	0.91	0.13			*
Z		8 05.6			2					
1753	15°58	12 35.75	M	ImIV	17.5	0.95	0.47	737	10	
		15 08.7			4			10		
1754	11°48	12 35.76	M	dE2	19.0	0.65	0.10			
		11 27.3			4					
1755	7°44	12 35.77	M	dE4:,N	15.7	0.91	0.22			
		7 29.5			4					
1756	9°56	12 35.78	M	dE5	17.9	0.79	0.33			
		9 23.4		or Im	4					
1757	NGC 4584	12 35.78	M	Sa(s) pec	13.72	1.37	0.27	1768	91	
Z	UGC 7803	13 23.1			1	1.18	0.11	16		
1758	UGC 7802	12 35.81	M	Sc (on edge)	14.99	1.33	0.78	1769	12	
Z		8 09.9			1	1.26	0.70	43		
1759		12 35.85	B	$RS0_1(0)$	15.2	0.86	0.00	9618	12	
Z		9 48.2			7			34		
1760	NGC 4586	12 35.92	-	Sa	12.54	1.73	0.57	794	37	
SA	UGC 7804	4 35.6			1	1.64	0.43	5		

TABLE II (a). (continued)

VCC Cat. Name 1 Name 2	R.A.(1950) Dec.(1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1) (2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1761	12 35.95	-	dE5?	16.8	0.70	0.33			
	14 21.1			4					
1762 10°55	12 36.00	M	dE6	16.2	1.06	0.52			
	10 39.2			4					
1763 NGC 4587	12 36.04	-	E5,N	14.04	1.16	0.43	901	11	
Z UGC 7805	2 56.0			1	1.17	0.22	29		
1764 6°43	12 36.06	M	dE4	15.8	0.80	0.24			
	6 46.7			4					
1765 IC 3609	12 36.06	B	Sb	14.86	0.73	0.18	9171	54	
Z	14 37.7			2			22		
1766 13°99	12 36.09	M	dE2:	18.5	0.69	0.10			
	13 47.0			4					
1767 9°57	12 36.10	M	dE5,N	16.5	0.91	0.30			
	9 57.1			4					
1768 IC 3608	12 36.10	M	Sbc (on edge)	14.52	1.63	0.92	7283	91	
Z UGC 7808	10 45.1			1	1.53	0.84	19		
1769	12 36.11	M	dE3:	20.0	0.33	0.18			
	12 53.2			4					
1770 6°44	12 36.16	-	?	18.4	0.43	0.33			
	6 56.7			4					
1771	12 36.20	M	ImIV-V?	18.8	0.60	0.52			
	9 48.4			4					
1772 NGC 4588	12 36.22	B	Sc(s)I-II	14.84	1.26	0.46			
Z UGC 7810	7 02.7			1	1.16	0.40			
1773 10°56	12 36.33	M	dE5:,N:	15.8	1.03	0.30			
	10 05.7			4					
1774	12 36.34	B	S	15.1	0.76	0.43	7338	12	
Z	7 23.4			7			50		
1775	12 36.36	M	dE:	20.0	0.43				
	13 15.4			4					
1776 10°57	12 36.39	M	dE	17.0:	1.06				
	10 31.1		or ImIV	4					
1777	12 36.47	-	dE?	20.0	0.03				
	8 40.9			4					
1778 IC 3611	12 36.54	M	Amorphous?	13.85	1.26	0.35	2526	12	
Z UGC 7817	13 38.3			1	1.29	0.21	65		
1779 IC 3612	12 36.57	M	dS0(6):	14.83	1.13	0.48	1226:	12	
Z 15°60	15 00.4			1	1.07	0.18	(59)		
1780 NGC 4591	12 36.66	B	Sb(s)	13.70	1.37	0.34	2421	32	
Z UGC 7821	6 17.1			1	1.26	0.27	9		
1781 8°42	12 36.66	M	dE4	18.7	0.56	0.22			
	8 20.9			4					
1782	12 36.68	M	dE	18.7	0.43				
	5 25.4			4					
1783 12°87	12 36.69	M	dE5,N	18.4	0.91	0.30			
	12 22.7			4					
1784 15°61	12 36.72	M	ImV	17.5	1.00	0.10			
	15 54.3			4					
1785 11°49	12 36.74	M	dE3,N	17.8	0.73	0.18			
	11 32.6			4					
1786 13°100	12 36.74	M	dE4	18.2	0.82	0.22			
	13 14.9			4					
1787	12 36.77	M	dE:	20.0	0.34				
	12 31.9			4					
1788	12 36.79	-	dE?	19.7	0.41				
	11 05.6			4					
1789	12 36.81	M	ImIII	15.07	0.95	0.25	1620	10	
Z	5 12.8			2			10		
1790	12 36.83	-	?	19.0	0.43				
	12 28.1			4					
1791 IC 3617	12 36.88	M	SBmIII/BCD	14.67	1.21	0.30	2093	86	
Z DDO 140	8 14.2			1	1.26	0.29	8		
1792 13°101	12 36.91	M	dE3	18.0	0.80	0.15			
	13 12.1			4					
1793	12 36.92	B	S (on edge)	15.2	1.03	0.78			
Z	4 32.6			7					
1794 12°88	12 36.92	M	dE5:,N	17.3	0.86	0.30			
	12 02.9			4					
1795 11°50	12 36.98	M	dE0	18.2	0.65	0.10			
	11 26.7			4					
1796 12°89	12 36.98	M	dE5:,N:	16.4	0.91	0.30			
	12 57.4			4					
1797	12 37.01	-	dE?	18.3	0.37				
	2 59.2			4					
1798	12 37.01	M	dE	18.5:	0.65:				
	11 43.6			4					
1799 IC 3625	12 37.04	B	S0:	15.3	0.51	0.08	22429	12	*
Z	11 14.5			4			30		
1800 10°58	12 37.10	-	dE?	19.5	0.43				
	10 43.0			4					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec.(1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1801		12 37.11	-	dE?	19.5	0.43				
		2 30.5			4					
1802		12 37.11	B	S	14.9	0.76	0.43	7278	12	
Z		7 26.6			7			37		
1803	11°51	12 37.11	M	dE1,N:	16.7	0.76	0.05			
		11 14.9			4					
1804	9°59	12 37.14	M	ImIII/BCD	15.5	1.10	0.40			
		9 40.4			4					
1805	9°58	12 37.19	M	dE	19.5:	0.63				
		9 35.0			4					
1806	13°102	12 37.19	-	dE1?	16.8	0.67	0.05			
		13 53.0			4					
1807		12 37.20	-	dE?,N	20.0	0.34				
		10 37.8			4					
1808	IC 3629	12 37.25	B	Sbc	15.2	1.01	0.45	13876	12	*
Z		13 48.5			4			38		
1809	IC 3631	12 37.28	B	S0/Sa	14.17	0.95	0.22	2801	97	
Z	UGC 7825	13 14.9			1	1.03	0.14	19		
1810		12 37.29	B	S	15.1	0.73	0.12			
Z		4 04.2			7					
1811	NGC 4595	12 37.35	M	Sc(s)II.8	12.92	1.43	0.18	631	87	
SA	UGC 7826	15 34.4			1	1.26	0.17	4		
1812		12 37.39	M	dE3,N	17.2	0.57	0.15			
		12 08.0			4					
1813	NGC 4596	12 37.41	M	SBa	11.51	1.77	0.07	1834	34	
SA	UGC 7828	10 27.1			1	1.59	0.14	29		
1814		12 37.42	M	dE0	18.7	0.56	0.00			
		11 50.5			4					
1815	12°90	12 37.42	M	dE2	17.7	0.88	0.10			*
		12 10.7			4					
1816	14°63	12 37.46	M	ImIV-V	16.2	1.16	0.36	1005	10	
		14 03.4			4			10		
1817		12 37.51	M	dE	20.0	0.26:				
		10 13.8			4					
1818	13°104	12 37.51	M	dE4	18.4	0.80	0.22			
		13 55.8			4					
1819	6°45	12 37.54	-	?	18.8	0.42				
		6 01.9			4					
1820	13°103	12 37.56	-	Im?	19.0	0.41				
		13 18.6			4					
1821	7°45	12 37.61	-	?	17.2	0.73	0.30			
		7 09.5			4					
1822	7°46	12 37.63	M	ImIV	15.6	0.95	0.40	1012	10	
		7 07.3			4			10		
1823		12 37.63	M	dE4?	18.8	0.52	0.22			
		13 04.0			4					
1824		12 37.64	B	SBa(s)	15.3	0.76	0.20			
Z		5 39.2			7					
1825	10°59	12 37.66	M	dE2	15.7	1.10	0.08			
		10 07.3		or ImIV	4					
1826	IC 3633	12 37.66	M	dE2,N	14.87	0.86	0.12	2033	12	
Z		10 10.2			2			38		
1827	NGC 4598	12 37.67	M	$SB0_{2/3}(2)$	13.41	1.21	0.18	1961	11	
Z	UGC 7829	8 39.5			1	1.30	0.05	23		
1828	IC 3635	12 37.71	M	dE2,N	14.9	1.08	0.15	1517	12	
Z	13°105	13 08.9			7	1.10	0.03	57		
1829	7°47	12 37.75	-	dE5?,N	17.3	0.67	0.30			
		7 00.4			4					
1830	IC 3638	12 37.76	B	Sbc(r)II	14.25	0.95	0.10	6474	12	
Z		10 47.6			2			34		
1831		12 37.78	M	dE0:,N:	18.0	0.65	0.00			
		11 16.1			4					
1832		12 37.79	M	dE3	19.0	0.66	0.15			
		15 40.9			4					
1833		12 37.80	M	$S0_1(6)$	14.69	0.80	0.15	1679	12	
Z		16 12.8			2			34		
1834	NGC 4600	12 37.83	-	$S0_1(6)$,N	13.47	1.21	0.33	787	11	
Z	UGC 7832	3 23.5			1	1.20	0.15	34		
1835		12 37.83	M	dE:	20.0	0.26:				
		12 59.5			4					
1836	IC 3637	12 37.83	M	dS0(6) pec:	14.92	1.46	0.43			
Z	14°64	14 59.5			2					
1837		12 37.84	-	?	17.0	0.86	0.35			
		2 53.1			4					
1838		12 37.85	B	Sc	15.0	0.95	0.19	14217	12	*
Z		8 26.9			7			44		
1839		12 37.89	-	dE1,N	17.2	0.56	0.05			
		4 19.5			4					
1840		12 37.92	M	dE	18.5:	0.73				
		10 24.2			4					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1841		12 37.93	M	dE	19.6	0.34				
		12 28.6			4					
1842		12 37.94	B	Sc (on edge)	15.3	0.95	0.70			
Z		5 18.4			7					
1843	11°52	12 37.94	M	dE4:	17.7	0.88	0.23			
		11 06.8			4					
1844		12 37.96	-	?	19.5	0.26				
		9 59.8			4					
1845		12 37.99	B	S0	15.3	0.62	0.28			
Z		5 37.9			7					
1846		12 37.99	M	dE3	18.3	0.68	0.15			
		9 35.3			4					
1847		12 38.03	B	RS0(r)/a	14.91	0.95	0.28			
Z		2 44.7			2					
1848		12 38.03	-	dE?	19.4	0.34				
		4 12.5			4					
1849		12 38.06	-	BCD?	16.2	0.43	0.33			
		9 49.7			4					
1850		12 38.06	-	?	19.5	0.43				
		15 38.7			4					
1851		12 38.21	-	dE6?	18.8	0.32	0.40			
		10 41.0			4					
1852		12 38.21	M	dE	19.5	0.48				
		14 03.8			4					
1853		12 38.24	M	dE2:	18.5	0.56	0.12			
		16 02.8			4					
1854		12 38.25	-	dE?	19.0	0.53				
		3 15.3			4					
1855		12 38.29	-	S0:	15.2	0.86	0.30			
Z		4 48.1			7					
1856	8°43	12 38.31	M	dE4:	18.8	0.65	0.22			
		8 12.3			4					
1857	IC 3647	12 38.36	M	dE4:,N?	14.33	1.33	0.30	634:		12
Z	10°60	10 45.0			1	1.26	0.19	(69)		
1858		12 38.38	M	dE	19.5	0.49				
		12 48.4			4					
1859	NGC 4606	12 38.44	M	Sa pec	12.69	1.80	0.40	1650		58
Z	UGC 7839	12 11.2			1	1.44	0.25	20		
1860		12 38.44	-	?	18.0	0.81	0.15			
		15 33.2			4					
1861	IC 3652	12 38.45	M	dE0,N	14.37	1.03	0.00	683:		12
Z	UGC 7838	11 27.5			1	1.10	0.00	(54)		
1862		12 38.47	-	dE?	19.0	0.45				
		14 30.9			4					
1863	12°91	12 38.56	M	dE:	19.3	0.34				
		12 32.4			4					
1864		12 38.57	-	Im?	16.8	0.49	0.23			
		3 53.1			4					
1865		12 38.60	-	dE:	19.2	0.38				
		4 01.8			4					
1866		12 38.63	-	dE0?	16.7	0.56	0.00			
		8 16.8			4					
1867	15°62	12 38.66	M	dE0:	17.7	0.86	0.00			
		15 19.7			4					
1868	NGC 4607	12 38.68	M	Scd (on edge)	13.75	1.69	0.70	2241		93
Z	UGC 7843	12 09.6			1	1.51	0.61	13		
1869	NGC 4608	12 38.70	M	$SB0_3/a$	12.05	1.73	0.10	1864		34
SA	UGC 7842	10 25.7			1	1.50	0.08	21		
1870	11°53	12 38.73	M	dE6	15.8	1.16	0.43			
		11 34.3			4					
1871	IC 3653	12 38.74	M	E3	13.86	0.80	0.15	603		12
Z		11 39.7			2			28		
1872		12 38.77	-	dE:	18.5:	0.64				
		2 22.7			4					
1873		12 38.77	-	?	16.4	0.86	0.37			
		6 47.9			4					
1874	13°106	12 38.80	M	dE	18.3	0.73				
		13 26.5			4					
1875		12 38.84	B	$S0_1(6)$	14.8	0.86	0.49			
Z		6 57.1			7					
1876	IC 3658	12 38.85	M	dE5,N	14.85	1.26	0.30	45		12
Z	14°65	14 58.7			2			49		
1877	8°44	12 38.87	M	dE	18.6	0.56				
		8 38.4			4					
1878	NGC 4611	12 38.91	B	Sbc	14.91	1.22	0.67	6124		91
Z	UGC 7849	14 00.2			1	1.13	0.57	19		
1879	11°55	12 38.93	M	dE1:,N	17.3	0.80	0.07			
		11 25.2			4					
1880	12°92	12 38.95	M	dE3:	18.3	0.63	0.15			
		12 42.1			4					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec.(1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ε	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1881	11°54	12 38.97	M	dE3:,N	16.2	1.03	0.18			
		11 02.3			4					
1882		12 38.98	M	dE,N	19.0	0.49				
		11 57.3			4					
1883	NGC 4612	12 39.01	M	$RSB0_{1/2}$	12.57	1.43	0.18	1875	34	
SA	UGC 7850	7 35.3			1	1.34	0.08	22		
1884	9°60	12 39.12	M	dE	16.0:	1.23:				
		9 28.7		or ImV	4					
1885	16°43	12 39.12	M	ImV	17.2	1.16	0.30			
		16 06.0			4					
1886		12 39.13	M	dE5,N	14.87	1.16	0.30	1159:	12	
Z		12 31.4			2			(65)		
1887		12 39.21	-	dE4?	16.7	0.62	0.19			
		4 16.9			4					
1888		12 39.21	M	dE	20.0:	0.44				
		13 56.6			4					
1889	11°58	12 39.24	M	ImIV:	16.0	1.10	0.30			
		11 31.5			4					
1890	IC 3665	12 39.25	M	dE4 pec	14.84	1.16	0.20	1227	12	
Z	11°56	11 45.7		or dS0(4)	1	1.03	0.14	57		
1891	11°57	12 39.29	M	dE4,N	16.7	0.80	0.24			
		11 27.9			4					
1892	8°45	12 39.30	M	dE	18.3	0.69				
		8 34.5			4					
1893		12 39.31	-	dE2,N	16.5	0.73	0.08			
		3 01.1			4					
1894		12 39.33	-	dE?	19.5	0.21				
		6 38.2			4					
1895	UGC 7854	12 39.34	M	d:E6	14.91	1.30	0.56	1032:	12	
Z		9 40.5			1	1.03	0.20	(51)		
1896		12 39.38	M	$dSB0_1(2),N$	14.78	1.07	0.11	1731:	12	
Z		9 51.4			2			(64)		
1897	UGC 7857	12 39.39	M	dE4,N:	14.49	1.37	0.34	18	12	
Z		14 02.8			1	1.13	0.06	60		
1898		12 39.41	-	?	16.2	0.91	0.35			
		4 05.6			4					
1899		12 39.42	M	dE	20.0	0.34:				
		9 06.4			4					
1900	13°107	12 39.45	M	ImV	16.0	1.03	0.15			
		13 20.4		or dE3	4					
1901	11°59	12 39.46	-	dE7 pec?	17.6	0.80	0.46			
		11 10.4			4					
1902	NGC 4620	12 39.47	M	S0/Sa	13.17	1.43	0.06	1066	78	
Z	UGC 7859	13 13.1			1	1.31	0.05	50		
1903	NGC 4621	12 39.52	M	E4	10.76	1.80	0.27	424	34	
SA	M 59	11 55.2			1	1.71	0.18	12		
1904		12 39.53	M	dE,N	19.0:	0.56:				
		11 13.7			4					
1905	12°93	12 39.53	M	dE2	18.0:	0.69	0.10			
		12 45.5		or ImIV	4					
1906	15°63	12 39.53	-	S0:	15.7	0.86	0.12			
		15 55.0			4					
1907		12 39.56	-	?	19.0	0.31				
		4 28.9			4					
1908		12 39.57	B	S pec	15.1	0.56	0.05			
Z		5 46.9			7					
1909	12°94	12 39.60	M	dE5,N	16.1	0.95	0.30			
		12 06.2			4					
1910	IC 809	12 39.61	M	dE1,N	14.17	1.10	0.10	206	12	
Z	IC 3672	12 01.7			1	1.14	0.00	26		
1911		12 39.62	-	dE:	19.5:	0.37:				
		4 58.2			4					
1912	IC 810	12 39.63	M	dS0(8),N	14.16	1.33	0.78	-169	68	
Z	UGC 7864	12 52.3			1	1.30	0.43	28		
1913	NGC 4623	12 39.64	M	E7	13.22	1.43	0.63	1892	34	
SA	UGC 7862	7 57.1			1	1.42	0.45	37		
1914	15°64	12 39.69	-	?	19.5	0.83	0.30			
		15 05.9			4					
1915	12°95	12 39.71	M	dE3	16.7	0.76	0.15			
		12 49.3			4					
1916	14°66	12 39.73	-	Im?	17.0	0.86	0.10			
		14 28.7			4					
1917		12 39.76	-	dE0,N	15.6	0.98	0.00			
		3 44.6			4					
1918	6°47	12 39.76	-	ImIII?	15.8	0.91	0.45			
		6 00.8			4					
1919	10°61	12 39.79	M	dE0,N	17.0	0.73	0.00			
		10 50.5			4					
1920		12 39.80	-	S0?	15.2	0.73	0.00			*
Z		2 20.4			4					

TABLE II (a). (continued)

VCC Cat. Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1) (2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1921 12°96	12 39.90 12 00.8	M	dS0(8)	15.9 4	1.19	0.52			
1922	12 39.94 14 38.9	-	E0?	17.5 4	0.37	0.00			
1923 NGC 4630 SA UGC 7871	12 39.97 4 14.0	-	Sbc(s)II-III	13.14 1	1.46 1.23	0.16 0.13	736 5	88	
1924	12 39.97 10 35.7	-	dE?	18.7 4	0.26				
1925	12 40.03 12 05.7	M	dE	19.5: 4	0.58				
1926	12 40.06 10 37.1	M	dE	19.3 4	0.33				
1927 IC 3686 Z	12 40.09 10 50.4	B	Sc(s)II	14.91 2	1.00	0.34			
1928 13°108	12 40.11 13 52.8	M	dE3,N:	17.5 4	0.95	0.15			
1929 NGC 4633 Z UGC 7874	12 40.11 14 37.8	M	Scd(s)	13.77 1	1.49 1.32	0.36 0.35	290 5	79	
1930	12 40.17 8 07.0	-	dE?	19.5 4	0.26				
1931 Z	12 40.17 13 32.4	M	ImIII:	15.2 7	1.03	0.25	-10 24	12	
1932 NGC 4634 Z UGC 7875	12 40.17 14 34.2	M	Sc (on edge)	13.19 1	1.56 1.38	0.52 0.55	178 50	89	
1933 7°48	12 40.21 7 36.7	-	Sab?	15.8 4	0.95	0.10			
1934	12 40.22 3 42.3	-	dE5,N	16.1 4	0.94	0.30			
1935	12 40.22 6 52.5	-	dE?	19.5 4	0.26				
1936 Z	12 40.24 9 46.9	M	dS0(0):,N	15.04 2	0.91	0.00			
1937 7°49	12 40.27 7 07.0	M	dE	19.0 4	0.41				
1938 NGC 4638 SA UGC 7880	12 40.27 11 42.9	M	$S0_1(7)$	12.11 1	1.40 1.45	0.15 0.24	1147 18	34	*
1939 NGC 4636 SA UGC 7878	12 40.29 2 57.7	-	$E1/S0_1(1)$	10.48 1	1.75 1.79	0.04 0.09	979 20	20	
1940 IC 3690 Z UGC 7879	12 40.30 10 38.0	B	Sb:	14.96 1	1.12 1.13	0.54 0.51	7610 17	91	
1941	12 40.31 13 33.9	-	dE?	18.0 4	0.34				
1942 12°97	12 40.32 12 34.9	M	dE4,N:	16.5 4	0.78	0.22			
1943 NGC 4639 SA UGC 7884	12 40.35 13 31.9	M	SBb(r)II	12.19 1	1.60 1.46	0.20 0.14	972 7	34	
1944	12 40.35 14 33.8	-	BCD?	18.0 4	0.43	0.33			
1945 NGC 4637 Z 11°60	12 40.38 11 42.6	M	dE6,N	14.82 1	1.21 1.17	0.52 0.27			*
1946	12 40.39 12 48.8	M	dE	20.0 4	0.41				
1947 Z	12 40.40 3 57.1	-	dE2,N	14.56 2	0.95	0.10			
1948 10°62 Z	12 40.45 10 57.3	M	dE3	15.1 7	0.95	0.15			
1949 NGC 4640 Z 12°98	12 40.45 12 33.6	M	dSB0(4),N or dE(6,4),N	14.19 1	1.38 1.22	0.22 0.15	2077 75	12	*
1950 16°46	12 40.49 16 22.3	M	dE2:	17.7 4	0.73	0.10			
1951 11°61	12 40.50 11 58.3	M	dE0,N	17.0 4	0.81	0.00			
1952 7°50	12 40.58 7 55.4	M	ImIV	16.0: 4	0.95	0.30			
1953	12 40.58 15 10.5	-	dE4?,N	19.0 4	0.74	0.22			
1954 IC 3694 Z	12 40.59 11 29.2	B	Sbc	14.8 7	0.80	0.29	8493 34	12	*
1955 NGC 4641 Z 12°99	12 40.60 12 19.4	M	S pec/BCD	14.12 1	1.23 1.20	0.10 0.15	2305 75	5	
1956 Z	12 40.62 3 51.3	-	S	15.1 7	0.86	0.35			
1957 14°67	12 40.62 14 47.5	-	dE4?,N	18.4 4	0.65	0.19			*
1958 11°62	12 40.65 11 18.4	M	dE2,N	17.0 4	0.69	0.10			
1959 Z 13°109	12 40.72 4 21.6	B	S0	15.2 7	0.56	0.10			*
1960	12 40.75 13 31.0	-	ImIII/BCD?	17.0: 4	0.76	0.33			

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1961	IC 3698	12 40.76	B	Sc	14.9	0.73	0.00	8285	12	
Z		11 29.1			7			38		
1962		12 40.78	B	S0	15.1	0.73	0.08			
Z		3 49.4			7					
1963		12 40.78	M	dE,N	20.0	0.34:				
		11 45.1			4					
1964	9°61	12 40.80	M	dE4:	18.0:	0.82	0.22			
		9 13.6			4					
1965		12 40.82	-	Im?	16.5	0.80	0.24			
		3 41.5			4					
1966	14°68	12 40.87	-	dE5?	17.6	0.89	0.33			
		14 26.7			4					
1967		12 40.88	-	dE4?	17.7	0.76	0.20			
		3 56.0			4					
1968		12 40.93	M	dE	20.0	0.26				
		11 13.7			4					
1969	IC 3702	12 40.95	B	SBc	14.9	0.65	0.14	8602	12	
Z		11 08.9			7			37		
1970	10°63	12 40.96	M	ImIII-IV,N?	15.5	0.95	0.15			
Z		10 22.0			7					
1971	11°63	12 41.00	M	dE3:	16.6	0.72	0.15			
		11 19.1			4					
1972	NGC 4647	12 41.02	M	Sc(rs)III	12.03	1.51	0.08	1422	37	
SA	UGC 7896	11 51.2			1	1.48	0.09	4		
1973		12 41.06	-	dE,N:	18.5	0.41				
		3 39.5			4					
1974		12 41.08	-	dE	19.0	0.26				
		3 38.0			4					
1975		12 41.08	M	dE3	18.8	0.63	0.15			
		11 01.7			4					
1976	13°110	12 41.08	M	dE0	18.5:	0.62	0.00			
		13 31.4			4					
1977		12 41.11	-	?	20.0	0.34				
		11 34.1			4					
1978	NGC 4649	12 41.15	M	$S0_1(2)$	9.81	1.80	0.00	1144	34	
SA	M 60	11 49.5			1	1.86	0.07	15		
1979	IC 3704	12 41.23	B	Sc	14.68	1.16	0.60	8686	91	
Z	UGC 7899	11 02.6			1	1.13	0.51	18		
1980	9°62	12 41.27	M	dE4,N	16.1	0.80	0.24			
		9 02.0			4					
1981		12 41.31	-	ImV?	19.0:	0.56				
		4 02.1			4					
1982	11°64	12 41.32	M	dE6:	15.3	0.93	0.40			
		11 44.2			7					
1983	11°65	12 41.38	M	dE1	16.6	0.76	0.05			
		11 01.0			4					
1984		12 41.41	B	Sa	15.1	0.65	0.14			
Z		3 53.4			7					
1985	10°64	12 41.41	M	dE	20.0	0.43				
		10 53.0			4					
1986		12 41.44	M	dE,N	19.0	0.60				
		12 09.2			4					
1987	NGC 4654	12 41.44	M	SBc(rs)II	11.14	1.79	0.28	1036	20	
SA	UGC 7902	13 24.0			1	1.67	0.20	6		
1988	IC 3709	12 41.54	B	Sbc(r)I-II	14.78	0.98	0.14	14336	12	
Z		9 20.2			2			40		
1989	13°111	12 41.56	M	dE:	18.3	0.48				
		13 31.4			4					
1990		12 41.59	M	dE:	19.5	0.34				
		12 57.4			4					
1991	11°66	12 41.64	M	dE3,N	15.6	0.98	0.15			*
		11 27.0			4					
1992	12°100	12 41.65	M	ImIV	15.5	1.16	0.20	1006	10	
	UGC 7906	12 23.4			4			10		
1993		12 41.69	-	E0	15.3	0.56	0.00			
Z		13 12.9			7					
1994	10°65	12 41.70	M	dE2	16.8	0.80	0.11			
		9 59.8		or ImV	4					
1995	12°101	12 41.77	M	dE5:	15.8	0.91	0.26			
		12 18.0			4					
1996	8°48	12 41.82	M	dE4	18.5	0.73	0.25			
		8 40.6			4					
1997	IC 3714	12 41.86	B	SBb(s)I	15.1	1.00	0.26			
Z		10 27.7			7					
1998		12 41.86	M	dE2:	18.2	0.43	0.10			
		13 16.9			4					
1999	NGC 4659	12 41.98	M	Sa	13.08	1.39	0.20	267	12	
Z	UGC 7915	13 46.3			1	1.26	0.13	50		
2000	NGC 4660	12 42.02	M	$E3/S0_1(3)$	11.94	1.33	0.18	1097	34	
SA	UGC 7914	11 27.6			1	1.44	0.15	13		

TABLE II (a). (continued)

VCC Cat. Name 1 Name 2	R.A.(1950) Dec.(1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1) (2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2001	12 42.03	M	dE0	19.0	0.38	0.00			
	12 04.2			4					
2002	12 42.06	M	dE	19.5	0.36				
	11 28.6			4					
2003 11°67	12 42.17	M	dE4	18.2	0.67	0.22			
	11 47.5			4					
2004 9°63	12 42.24	M	dE0	16.0	0.73	0.00			
	9 15.3			4					
2005	12 42.24	B	Sc(s)II-III	14.9	0.76	0.20			
Z	10 01.9			7					
2006 IC 3718	12 42.25	M	Amorphous	13.68	1.51	0.56	844	23	
Z UGC 7920	12 37.6			1	1.47	0.39	20		
2007 IC 3716	12 42.26	M	ImIII/BCD:	15.2	0.76	0.27	1857	10	
Z 8°49	8 22.9			7			10		
2008 IC 3720	12 42.28	M	dE5	15.0:	1.28	0.32			
12°102	12 20.3			4					
2009 IC 3724	12 42.37	B	Sc(s)I-II	15.1	0.86	0.20			
Z	10 33.4			7					
2010 12°103	12 42.37	M	dE5	19.0	0.56	0.30			
	12 27.4			4					
2011 12°104	12 42.56	M	dE2	17.1	0.86	0.12			
	12 37.6			4					
2012 IC 3727	12 42.58	M	dE1:,N:	14.30	1.12	0.05			
Z 11°68	11 10.4			1	1.19	0.00			
2013	12 42.61	M	dE4	18.3	0.65	0.22			
	8 51.8			4					
2014 10°66	12 42.65	M	dE0,N	17.5:	0.91	0.00			
	10 54.2			4					
2015 10°68	12 42.67	-	BCD?	16.2	0.56	0.12			
	10 35.9			4					
2016 13°112	12 42.68	-	?	18.2	0.65	0.40			
	13 32.5			4					
2017 7°51	12 42.71	M	dE3,N	17.0	0.73	0.18			
	7 53.3			4					
2018 10°67	12 42.75	B	Sa	14.88	1.16	0.00	9025	12	
Z	10 27.9			2			34		
2019 IC 3735	12 42.83	M	dE4,N	14.55	1.10	0.24	1895	12	
Z	13 58.0			2			44		
2020	12 42.87	B	$S0_1(8)$	15.13	1.00	0.63			
Z	9 21.6			2					
2021	12 42.94	M	dE:	19.0:	0.56:				
	13 18.0			4					
2022	12 43.02	M	dE	20.0	0.10				
	9 00.1			4					
2023 IC 3742	12 43.02	M	SBc(s)II	13.86	1.40	0.30	963	108	*
Z UGC 7932	13 36.4			1	1.27	0.26	5		
2024	12 43.03	-	dE?	20.0	0.21				
	8 13.0			4					
2025	12 43.06	M	dE4:	18.5	0.65	0.22			
	11 49.5			4					
2026	12 43.07	M	dE,N	20.0	0.52				
	14 39.6			4					
2027	12 43.11	-	Im?	18.5	0.52	0.52			
	10 52.4			4					
2028 13°113	12 43.11	M	dE7:	16.6	1.03	0.48			
	13 36.1			4					
2029 9°64	12 43.15	M	dE3	18.2	0.73	0.18			
	9 40.7			4					
2030	12 43.32	-	dE:	18.8	0.25				
	8 34.8			4					
2031	12 43.32	-	dE?	19.5	0.38				
	14 47.7			4					
2032 11°69	12 43.35	M	dE0	17.5	0.64	0.00			
	11 31.2			4					
2033	12 43.55	M	BCD	14.65	0.73	0.00	1483	51	
Z	8 44.9			2			5		
2034 10°69	12 43.61	M	ImIV	15.8	1.03	0.18	1500	10	
	10 26.2			4			10		
2035	12 43.63	-	dE?	20.0	0.26				
	8 58.8			4					
2036 IC 3754	12 43.73	B	SBa	14.44	1.16	0.30	6463	12	
Z UGC 7937	8 37.3			1	1.16	0.27	24		
2037 10°71	12 43.73	M	ImIII/BCD	15.8	1.26	0.37	1142	10	
	10 28.8			4			10		
2038 IC 815	12 43.86	B	E1	14.8	0.80	0.07	13305	12	
Z	12 09.1			7			33		
2039	12 43.95	M	dE,N?	20.0	0.43:				
	11 03.6			4					
2040	12 43.98	-	dE?	20.0	0.26				
	11 23.8			4					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2041		12 44.05	B	E6 (cD)	15.13	0.90	0.39	14268	12	*
Z		12 10.3			2			43		
2042	9°65	12 44.12	M	dE1,N	14.79	1.10	0.07			
Z	UGC 7942	9 34.8			1	1.07	0.04			
2043	10°72	12 44.14	M	dE3	18.0	0.80	0.15			
		10 25.2			4					
2044	IC 816	12 44.25	B	RSBa	14.74	1.03	0.12	7132	12	
Z	UGC 7944	10 07.7			1	1.03	0.14	29		
2045	10°73	12 44.40	M	dE6:,N	16.0	1.21	0.48			
		10 27.4			4					
2046	IC 817	12 44.43	B	E2	14.80	0.86	0.12	7427	12	
Z		10 07.9			2			33		
2047		12 44.62	M	dE:	19.5	0.34				
		11 44.2			4					
2048	IC 3773	12 44.74	M	d:S0(9)	13.85	1.42	0.52	1095	11	
Z	UGC 7952	10 28.6			1	1.36	0.43	44		
2049	12°105	12 44.75	M	dE8,N:	16.4	1.10	0.67			
	UGC 7953	12 02.1			4					
2050	IC 3779	12 44.83	M	dE5:,N	15.2	1.00	0.34	1367	12	
Z	12°106	12 26.4			7			75		
2051		12 44.98	M	dE2:	17.5	0.65	0.10			
		12 19.4			4					
2052		12 44.98	-	dE?	20.0	0.46				
		13 55.4			4					
2053		12 44.99	M	dE	19.2	0.45				
		8 12.4			4					
2054	9°66	12 45.14	M	dE3:	17.0	0.77	0.16			
		9 25.7			4					
2055		12 45.22	B	$S0_1(8)$	15.13	1.03	0.78			
Z		10 09.8			2					
2056	12°107	12 45.22	M	dE5 pec:	17.0	0.80	0.29			
		12 24.4			4					
2057	9°67	12 45.25	M	dE0	18.5	0.64	0.00			
		9 30.1			4					
2058	NGC 4689	12 45.25	M	Sc(s)II.3	11.55	1.86	0.12	1613	37	
SA	UGC 7965	14 02.1			1	1.60	0.06	5		
2059		12 45.28	-	dE?	20.0	0.21				
		7 58.6			4					
2060	9°68	12 45.41	M	dE3,N:	19.0	0.68	0.15			
		9 25.8			4					
2061	8°51	12 45.46	M	dE0	18.0	0.64	0.00			
		8 35.8			4					
2062	11°70	12 45.48	M	dE:	19.0:	0.84				
		11 14.9			4					
2063	14°69	12 45.54	M	dE4	17.0	0.95	0.22			
		13 59.9			4					
2064	8°52	12 45.60	M	dE3	18.4	0.63	0.15			
		8 33.9			4					
2065		12 45.67	-	dE?	19.5	0.26				
		11 59.4			4					
2066	NGC 4694	12 45.73	M	Amorphous	12.19	1.60	0.44	1177	20	
SA	UGC 7969	11 15.4			1	1.56	0.34	14		
2067	8°53	12 45.83	M	dE2:	18.2	0.56	0.12			
		8 18.8			4					
2068		12 45.83	-	dE?	18.8	0.43				
		10 18.1			4					
2069		12 45.84	-	dE?,N	19.5	0.26				
		8 06.1			4					
2070	NGC 4698	12 45.86	M	Sa	11.53	1.65	0.30	1002	31	
SA	UGC 7970	8 45.6			1	1.63	0.24	3		
2071		12 45.90	-	?	17.8	0.86	0.30			
		9 35.3			4					
2072		12 45.91	M	dE	19.0:	0.64				
		12 30.6			4					
2073		12 45.92	B	S0:	15.3	0.65	0.10			
Z		10 49.6			7					
2074	10°75	12 45.97	M	dE0	18.0:	0.73	0.00			
		10 01.7			4					
2075		12 45.99	-	dE?	19.3	0.49				
		14 04.7			4					
2076		12 46.06	B	SBbc	15.3:	0.82	0.39			*
Z		9 24.0			4					
2077		12 46.08	B	Sab:	15.2	0.73	0.18			
Z		11 08.9			7					
2078	12°108	12 46.23	M	dE2	17.5:	0.78	0.10			
		12 14.5			4					
2079		12 46.30	-	dE?	20.0	0.34				
		14 23.0			4					
2080	10°77	12 46.44	M	dE6 pec:	16.2	0.95	0.40			
		10 51.4			4					

TABLE II (a). (continued)

VCC Cat.	Name 1 Name 2	R.A.(1950) Dec. (1950)	VC memb.	Hubble type	B_T Source	$\log D_{est}$ $\log D_{25}$	$\log R_{est}$ $\log R_{25}$	$v_\odot$ ϵ	Source	Note
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2081	11°72	12 47.25	M	dE2 pec?	17.0	0.86	0.12			
		11 29.9			4					
2082		12 47.46	B	S	15.3	0.91	0.65			
Z		11 32.1			7					
2083	10°78	12 47.72	M	dS0:,N	15.2	0.86	0.12			
Z		10 48.6			7					
2084		12 47.88	M	dE	19.5	0.56				
		10 45.6			4					
2085		12 48.26	-	?	19.0	0.43				
		11 24.0			4					
2086		12 48.39	M	dE	20.0	0.56				
		11 02.5			4					
2087	NGC 4733	12 48.61	M	$SB0_2/a$	12.63	1.37	0.00	908	33	
Z	UGC 7997	11 11.0			1	1.37	0.04	23		
2088	11°73	12 48.67	M	dE0,N	17.7	0.86	0.00			
		11 31.0			4					
2089		12 48.69	-	BCD?	17.5	0.43	0.10			
		10 50.4			4					
2090	10°80	12 48.89	M	dE6,N	15.5	1.10	0.37			
	UGC 8001	10 50.9			4					
2091		12 49.59	M	dE3	18.5	0.81	0.15			
		11 18.2			4					
2092	NGC 4754	12 49.78	M	$SB0_1(5)$	11.51	1.73	0.33	1377	34	
SA	UGC 8010	11 35.2			1	1.67	0.26	15		
2093		12 49.80	M	dE3	18.5	0.83	0.15			
		11 27.7			4					
2094		12 50.08	M	ImV:	17.8	0.67	0.00			
		10 43.1			4					
2095	NGC 4762	12 50.42	M	$S0_1(9)$	11.18	1.98	0.65	984	20	
SA	UGC 8016	11 30.1			1	1.94	0.73	11		
2096		12 50.91	-	BCD	15.8	0.60	0.17			
		11 59.1		or merger	4					

Velocity sources (column 10)

1 Arakelyan et al.(1976)
2 Bothun and Caldwell (1984)
3 De Vaucouleurs et al.(1976,RC2)
4 De Vaucouleurs et al.(1979)
5 Eastmond and Abell (1978)
6 Fisher and Tully (1975)
7 Fisher and Tully (1977)
8 Ford et al.(1971)
9 Helou et al.(1984)
10 Hoffman et al.(1984)
11 Huchra et al.(1983)
12 Huchra (1984)
13 Humason et al.(1956)
14 Huchtmeier and Richter (1984)
15 Karachentsev a.Karachentseva (1982)
16 Kinman et al.(1977)
17 Rood (1980)
18 Sandage (1978)
19 Sandage and Dressler (1982)
20 Sandage and Tammann (1981)
21 Sulentic (1980)
22 Thuan and Seitzer (1978)
23 Haynes and Giovanelli (1984)

Combined sources:

31=9,20	46=10,17	61=9,12,15	76=15,21
32=12,14	47=3,5,12	62=3,10	77=10,12,19
33=5,12	48=9,14,20	63=10,11	78=11,19
34=12,20	49=12,19	64=5,10,12	79=4,9,12,14
35=9,17	50=10,14	65=3,14	80=12,19,21
36=10,15	51=10,12	66=7,14	81=12,14,15
37=9,12,20	52=9,11	67=3,12	82=4,12,15
38=4,9,12	53=12,15,19	68=15,19	83=12,15,21
39=10,22	54=12,15	69=4,9,12,21	84=4,10,15,17
40=3,17	55=5,12,14	70=4,10,12,19	85=12,17
41=9,12,14	56=10,12,14	71=14,18	86=6,10
42=4,17	57=9,12	72=9,12,14,19	87=9,15,20
43=12,21	58=5,9,12	73=4,5,10,12	88=12,14,20
44=14,20	59=5,17	74=4,21	89=9,12,14,15
45=10,12,15	60=8,12	75=5,9,10,12,14	90=12,19

Notes to Table II (a). (continued)

91=12,23	96=4,23	101=10,22,23	106=12,15,23
92=12,14,23	97=11,23	102=14,23	107=10,12,23
93=5,12,23	98=10,12,15,23	103=3,12,23	108=5,12,14,23
94=9,17,23	99=10,15,23	104=12,14,15,23	109=15,21,23
95=10,23	100=9,12,20,23	105=10,14,23	

Notes (asterisks in column 11)

VCC

27 Double galaxy according to CGCG. The faint component is not considered here; all data refer to the bright component.

47 See note to VCC 27.

76 See note to VCC 27.

83 See note to VCC 27.

86 Multiple system according to CGCG. Two Sc close together; data are for the whole system (including diameter).

101 Not = NGC 4186 as stated in DVP (VCC 81 is NGC 4186).

102 No clear double as stated in CGCG. The fainter component looks rather like a plume of the birght one. The two are inseparable; the data refer to the whole system.

103 Not = IC 3053 as in CGCG (VCC 95 is IC 3053).

106 This galaxy is not on a large-scale Campanas survey plate due to the misplacement of Virgo field 21 (see Fig.1). Data are from a IIIaJ Schmidt plate and are therefore less accurate.

113 See note to VCC 106.

121 Triple system according to CGCG. The 3 components are widely separated. All data refer to the brightest (most Northern) component which alone is considered here.

129 See note to VCC 106.

249 Declination wrong in CGCG and DVP.

270 See note to VCC 27.

302 See note to VCC 27.

311 See note to VCC 27.

322 Double galaxy according to CGCG. Here the double is split. This is the bright component which alone we call IC 3142; the faint one is the dwarf $14^{o}21$ (= VCC 319). The magnitude is corrected accordingly.

337 Double according to CGCG, but inseparable, tight merger. Data are for the whole system.

473, 475 Appear as one double galaxy in CGCG. DVP list only NGC 4296 but with total magnitude. New estimated magnitudes for both.

778 Double galaxy according to CGCG, or rather triple as stated in Zwicky (1971) where the whole system ≡ III Zw 65 ≡ NGC 4377 + 2 close compact companions. The "companions" are probably in the background and are not included in the catalog.

815 This dwarf should not be confused with the superposed blue compact galaxy B$\overset{s}{o}$ 106 (Boerngen 1983) in the background (v = 16442 km/s according to Huchra 1984), lying only 4" to the West of the nucleus of $13^{o}47$.

826 Zwicky galaxy missed by DVP.

870 Karachentsev and Karachentseva (1982) give a (heliocentric) velocity of 13931 km/s - which clearly must be wrong judged from the galaxy's morphology.

881 Double according to CGCG; here split. This is only the bright component (= NGC 4406), the faint one is the dwarf elliptical VCC 882 projected on the disk of the giant.

885 See note to VCC 27.

904, 907 Appear as one double galaxy in CGCG; here split as in DVP with data separated for the two galaxies.

Notes to Table II (a). (continued)

1066 Double in CGCG together with IC 3378. Here only the brighter galaxy, IC 3379, is considered. The magnitude is corrected accordingly.
1130 See note to VCC 27.
1172 Double galaxy in CGCG together with a faint background galaxy which is neglected here.
1249 The HI velocity (from Arecibo, source 10) of 468:(±10)km/s may rather be the signal from a cloud between NGC 4472 and this dwarf galaxy (see Sancisi et al.1984). Huchra (1984) gives an optical velocity of 276±78 km/s for $8^{o}33$.
1327 Bright star superposed. Magnitudes in CGCG and DVP are messed up. New estimated magnitude.
1355 The (heliocentric) velocity of 6210 km/s given by Karachentsev and Karachentseva (1982) must be wrong; this is a typical dE in the Virgo cluster.
1375} Two galaxies superposed on each other. Not recognized by CGCG. DVP did
1376} separate the two but give incorrect data. New estimated magnitudes and diameters.
1504 See note to VCC 27.
1508 Not a double galaxy as stated in CGCG. The close neighbour is a Zwicky galaxy of its own (i.e., is included in CGCG, namely VCC 1501 = NGC 4519A).
1581 =HoVII (Holmberg 1950); the only Holmberg dwarf included in the catalog.
1699 ="double" IC 3589/91 in CGCG. This is no double galaxy; it only looks like a double due to a bright superposed star at the edge of the galaxy (see picture in Paper III).
1713 This galaxy is not on a large-scale Campanas survey plate due to the slight misplacement of Virgo field 61 (see Fig.1). Data are from a IIIaJ Schmidt plate and are accordingly less accurate.
1721 See note to VCC 1713.
1737 Not = IC 3609 as in CGCG (VCC 1765 is IC 3609).
1748} See note to VCC 904/907.
1752}
1799 Double galaxy in CGCG together with $11^{o}51$ (= VCC 1803). Here the two are split. This is only the bright component (= IC 3625); the magnitude is corrected accordingly.
1808 See note to VCC 27.
1815 Declination wrong in Reaves (1983).
1838 Triple galaxy (as also stated in CGCG); inseparable; data are for the whole system (except type Sc which applies only to the brightest component).
1920 Zwicky galaxy missed by DVP.
1938} Appear as one double system in CGCG; here separated. DVP list only the
1945} brighter galaxy, NGC 4638.
1949 See note to VCC 27.
1954 See note to VCC 27.
1957 Declination wrong in Reaves (1983).
1959 See note to VCC 27.
1991 Declination wrong in Reaves (1983).
2023 Double galaxy in CGCG together with $13^{o}113$ (= VCC 2028). Here the two are separated. This is only the bright component (= IC 3742).
2041 See note to VCC 27.
2076 See note to VCC 27.

Column 1. upper line: *V*irgo *C*luster *C*atalog (VCC) number. lower line: Appearance of the galaxy in other catalogs: SA = Shapley-Ames catalog (RSA); Z = Zwicky *et al.* catalog (CGCG). Every SA galaxy is also a Z galaxy.

Column 2. Up to two names of the galaxy: NGC, IC, M, Reaves dwarf, DDO, UGC, and other identifications (in this order of preference).

Column 3. upper line: Right ascension in hours and minutes. lower line: Declination in degrees and minutes of arc. Both are for the epoch 1950.0. The accuracy is $\sim 10''$ or better.

Column 4. Virgo cluster membership status of the galaxy: M = cluster member; B = background; — = possible cluster member.

Column 5. Morphological type in the extended Hubble system as explained in Sec. II*e*, and, for late-type galaxies, the luminosity class.

Column 6. upper line: B_T = Total apparent blue magnitude. lower line: Source of the magnitude. The sources are listed in Table II(b).

Column 7. upper line: $\log D_{\rm est}$ = Decimal logarithm of the major diameter in 0.'1, estimated on du Pont 20-in. plates at the faintest visible surface-brightness level ($\sim 25.5\ B$ /(arcsec)^2). lower line: $\log D_{25}$ = Decimal logarithm of the major diameter in 0.1, measured at, or reduced to, a surface-brightness level of 25 B /(arcsec)^2. Source is DVP or, for faint galaxies, the photometry of Paper I.

Column 8. upper line: $\log R_{\rm est}$ = Decimal logarithm of the major-to-minor axis ratio, estimated on du Pont 20-in. plates at the faintest visible surface-brightness level ($\sim 25.5\ B$ /(arcsec)^2). lower line: $\log R_{25}$ = Decimal logarithm of the major-to-minor axis ratio, measured at, or reduced to, a surface-brightness level of 25 B /(arcsec)^2. Source is DVP.

Column 9. upper line: $v_\odot$ = Heliocentric velocity of the galaxy in km/s. lower line: ϵ = Mean error of the observed velocity.

Column 10. Source of the velocity. The sources are listed at the end of Table II(a).

Column 11. An asterisk refers to a note at the end of Table II(a).

In the following, we give a detailed description of the catalog data.

a) VCC numbers (column 1)

All galaxies in the present catalog are assigned VCC numbers running in order of right ascension.

b) Names (column 2)

Up to two identifications for each galaxy are given. If more names are known, the order of preference is as follows: NGC, IC (both from CGCG and other secondary sources), Reaves' (1983) designation for dwarf galaxies (such as 14°8, 15°6, etc.), DDO (van den Bergh 1959), M (= Messier), UGC (Nilson 1973), Mark (Markarian 1967–1969), Zwicky's (1971) designation for compact galaxies (such as II Zw 65), and the RMB, BB, and Bö designations for blue compact dwarfs (BCD) from the lists of Rubin *et al.* (1967), Barbieri and Benvenuti (1974), and Börngen (1983), respectively.

The maximum of two names in column 2 includes all NGC, IC, and Reaves designations, but it excludes many names assigned in the remaining catalogs. The correspondence of these missing names with the present VCC numbers is given in Appendix A (Tables III–VIII), where the correspondence between anonymous galaxies in Zwicky *et al.*'s catalog (1961–1963) and the VCC numbers is given also.

We will refer in the remaining papers of the present series to galaxies which did not previously occur in a catalog with their VCC numbers; this includes the preliminarily named dwarfs in Papers I and III, and in Caldwell (1983).

TABLE II (b). Magnitude sources [column 6 in Table II (a)].

1	De Vaucouleurs and Pence (1979) - Table 2
2	De Vaucouleurs and Pence (1979) - Table 4
3	Paper I
4	Estimate based on standards from source 3
5	Karachentsev and Karachentseva (1982)
6	Average from sources 1 and 4
7	Average from sources 2 and 4
8	Average from sources 5 and 4

c) Coordinates (column 3)

We have measured the α, δ coordinates of all VCC galaxies on du Pont 20-in. plates, except for a few very bright objects. The agreement of the positions of bright galaxies with those given in the RC2 (de Vaucouleurs *et al.* 1976) is excellent. We have therefore adopted the RC2 positions where available; for all remaining galaxies, the positions given are based on our measurements.

The positions by Ames (1930), as reduced by de Vaucouleurs and Pence (1979, DVP), showed deviations frequently of 1′ and occasionally of 2′. They were not used here.

To obtain positions, we have measured x, y coordinates of VCC galaxies and AGK3 reference stars on du Pont plates to within 0.5 mm, corresponding to $\sim 5''$. The x, y coordinates were then transformed into α, δ (1950.0). About 200 galaxies appear on two survey plates; their independently reduced positions from two plates have a mean deviation of slightly less than 10″. Nearer to the plate centers, the mean error is probably somewhat smaller. A mean positional error of $\lesssim 10''$ is supported by recently published positions by Ichikawa *et al.* (1984). The errors are probably larger for extended, low-surface-brightness dwarfs whose centers are difficult to define.

d) Membership Status (column 4)

One of the principal aims of the present catalog is the isolation of cluster members, i.e., galaxies within the volume defined by cluster members, from foreground and background objects. The problem has been discussed in Sec. II*b*, and only a brief summary is given here. The membership criteria applied are:

(1) dE and Im members have low surface brightness.

(2) Star-forming member galaxies are well resolved into stellar associations and H II regions.

(3) Spiral members are indicated by the luminosity class.

(4) The heliocentric radial velocity is in the range -700 km/s $< v < +2700$ km/s, which applies to all types.

Radial velocities serve in general only as a confirmation of morphological membership criteria, except for giant E and S0 galaxies, and for high-surface-brightness dwarfs where criteria (1)–(3) cannot be applied.

Unambiguous cluster members are designated with M in column 4, background galaxies with B. Possible members,

where no clear distinction is possible, are marked with—. No foreground galaxy was identified.

In the Southern Extension ($\delta < 5°$), we distinguish only between possible members (—) and background galaxies (B). In the W cloud and M cloud regions, all membership criteria break down, including the velocity criterion, except for the most extreme cases. Most galaxies in the W and M clouds are classified as possible members (—).

e) Galaxian Types (column 5)

The galaxies were classified primarily on the large-scale du Pont plates, but the deep IIIaJ 48″ Schmidt plates were always consulted for comparison and to allow for very faint surface-brightness features.

The classification system is in principle that set out in the *Hubble Atlas* (Sandage 1961) and in the *RSA* (Sandage and Tammann 1981, p. 5f). However, the system had to be extended to encompass the great variety of dwarf galaxies unfolding during the course of the preparation of the present catalog. The extension of the classification is described in Paper III (Sandage and Binggeli 1984). The main features of this extension are:

(1) Dwarf S0 galaxies (dS0) were found in analogy to the much more common dE's. As most dS0's appear to contain no dust, the dust type subscript (in the notation of the *Hubble Atlas*) is given only for the few dusty $dS0_3$ systems.

(2) A large fraction of early-type dwarfs, i.e., dE's and dS0's, show an unresolved, star-like *nucleus* at their centers. The presence of a nucleus is indicated by adding N to the type, e.g., dE3, N. It should be noted that nuclei fainter than $B = 23$ fall below the plate detection limit. Most nuclei in luminous E and S0 galaxies were probably missed due to high surface brightness.

(3) Dwarfish, irregular galaxies of *high* surface brightness—formerly called "extragalactic H II regions"—are classified here as BCD (= *b*lue *c*ompact *d*warfs) following Thuan and Martin (1981). Their closest relatives are probably Im III systems; in fact some galaxies are classified as Im/BCD. Type examples are given in Paper III; more about the BCD's and a complete list is given in Appendix C.

(4) Dwarfish E galaxies of *high* surface brightness (like M32) are not indicated in column 5, but their complete list down to $B_T = 18$ is given in Appendix C (Table XIII).

(5) Very extended dwarf galaxies of extremely low surface brightness may constitute a separate class, but they are not identified in column 5. Their complete list is given in Appendix C (Table XIV).

(6) Ellipticity classes are extended to include dE and dS0 systems. For dE's, simply Hubble's definition $e = 10\,(1 - R^{-1})$ is used, where the axis ratio R is taken to be given by $\log R = 1/2\,(\log R_{\rm est} + \log R_{25})$. Where no R_{25} values are available (cf. column 8), it is assumed $R = R_{\rm est}$. The ellipticity classes (given in parentheses) of dS0 galaxies are eye estimates from the du Pont plates. They refer to the *disk* and they may differ considerably—particularly in the case of barred and edge-on S0's—from the ellipticity classes calculated from the isophotal axis ratios R.

(7) Luminosity classes (LC) in Roman numerals are assigned, where possible, to all galaxies later than Sa. For spirals, the classification is based on the regularity of the spiral arms, as originally proposed by van den Bergh (1960). For faint late-type systems, the spiral structure is lost, and the classification has to rely on surface brightness. A sequence of LC = I to V is illustrated in the RSA. The present classification deviates systematically to some degree from this sequence, as explained in Paper III (p. 922). The luminosity class difference Δ = LC (VCC) − LC (RSA) increases up to one luminosity class for the faintest galaxies. Thus the luminosity classes given here are not in the RSA system, but rather in the system illustrated in Paper III.

Classification uncertainties are indicated by:, more severe uncertainties by?. These symbols follow the uncertain parts of the classification, e.g., dE4?, N versus dE4,N?. Ellipticity class and luminosity class are either given without indicating an uncertainty or are not given at all. In a number of cases, it is impossible to distinguish with any certainty between dE, dS0, and Im galaxies. The classification Im? or Im: means therefore that it could be also a dE or dS0 galaxy. The corresponding alternatives hold for dE?, dE:, dS0?, and dS0: galaxies. In cases where no type assignment could be preferred the ambiguity is spelled out: "dE or Im". At present, it is not clear whether these uncertain cases are due to insufficient resolution or whether they represent truly transitional types.

In some cases, uncertain type assignments are coupled with uncertain membership assignments. For instance, an Im? background? galaxy is a certain cluster member *if* the classification Im is correct; in case it were some giant galaxy it would belong to the background.

f) Magnitudes (column 6)

The total blue magnitudes B_T come from eight sources:

(1) For 139 bright catalog galaxies in the Virgo cluster area, accurate B_T magnitudes are listed by de Vaucouleurs and Pence (1979, DVP), who also give fully corrected Zwicky magnitudes for an additional 373 bright galaxies with a quoted mean error of 0.14 mag.

(2) DVP (Table IV) give B_T values for an additional 668 galaxies. The magnitudes are derived from Zwicky magnitudes by a bulk correction. Their quoted mean error of 0.34 mag seems somewhat optimistic judging from source (4).

(3) Detailed surface photometry for 109 galaxies in Virgo Fields 18 and 25 was carried out on the Las Campanas plates, as described in Paper I. The 1σ errors of these magnitudes down to the plate limit of dE's, i.e., $B_T \sim 20$ mag, was estimated to be 0.1 mag. This estimate has since been confirmed by 21 galaxies for which independent magnitudes of Ichikawa *et al.* (1984) were kindly made available by Dr. S. Okamura. A comparison of the two magnitude systems yields (cf. Fig. 3, dark circles):

$$B_T\,(\text{Paper I}) = 1.09\,B_T\,(\text{Ichikawa } et\ al.) - 1^{\rm m}57 \qquad (1)$$

over the range $14 < B_T \leqslant 19$. The scatter about the correlation line for the 21 galaxies is $0^{\rm m}12 (1\sigma)$.

(4) For about one thousand catalog dwarf galaxies, B_T magnitudes were estimated on the du Pont plates. The eye estimates are based on the estimated *mean* surface brightness of a galaxy and its surface, reckoned from the apparent mean diameter. For the surface-brightness estimates, the galaxies from source (3) were used as photometric standards down to the detection limit.

The procedure requires uniformity for all 67 du Pont plates. The requirement is not fully met, some plates being somewhat deeper, others shallower. Additive Δm corrections were therefore applied to all galaxies on one plate. The (positive or negative) values of Δm were determined from IIIaJ 48″ Schmidt plates, which cover an area about ten times larger. The corrections never exceed 0.3 mag. Another error source comes from the specific optical design of the

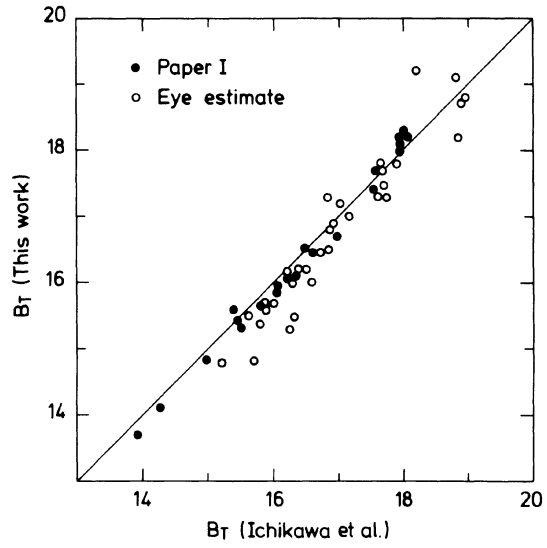

FIG. 3. Present B_T magnitudes versus the independently determined B_T's of Ichikawa *et al.* (1984) for galaxies common to both sources. The line of identity is shown.

100″ du Pont telescope. It results in a center-edge density gradient. A comparison with Reaves' magnitudes (cf. Appendix B, Fig. 8), which are derived from IIIaJ 48″ Schmidt plates, shows that the effect influences only dwarfs with $B_T > 18$ mag by up to 0.3 mag. A corresponding correction was not applied.

150 dwarfs lie in regions of plate overlap. Two magnitude estimates are available for them. The magnitude pairs indicate an average mean error of 0.5 mag; the value is somewhat smaller for bright dwarfs ($B_T < 16$) and somewhat larger for faint dwarfs ($B_T > 18$). Independent magnitudes are available from Ichikawa *et al.* (1984) for 32 dwarfs. They are correlated with our magnitudes (cf. Fig. 3, light circles) by

$$B_T(\text{estimate}) = 1.10\, B_T\ (\text{Ichikawa } et\ al.) - 1^{\text{m}}.91 \qquad (2)$$

over the range $14 < B_T \leqslant 19$. The scatter about the correlation line is $0^{\text{m}}.36 (1\sigma)$. Besides a moderate scale difference (stemming from the *bright* dwarfs), equation (2) shows that our error estimate is realistic or even conservative.

(5) Karachentsev and Karachentseva (1982) have given B_T magnitudes for ten BCD's and a few Im's of the present catalog with a quoted mean error of ~ 0.2 mag. These magnitudes were adopted and they served as additional photometric standards for the higher-surface-brightness dwarfs under source (4) (cf. Appendix C, Table XII).

(6)–(8) In general, we have adopted galaxy magnitudes as previously published in the literature. However, in all cases where we had reasons to assume that our magnitudes in source (4) carry equal weight we have listed mean magnitudes [cf. Table II(b)].

g) Diameters (column 7)

For all 2096 catalog galaxies, major-axis diameters D_{est} were measured on the du Pont plates at the faintest detectable isophote. They are given logarithmically in units of 0.1 in column 7, upper line. The lower line lists $\log D_{25}$—the major-axis diameter at 25 B mag/(arcsec)^2—for all galaxies for which this quantity is available from (a) de Vaucouleurs and Pence (1979), and/or (b) surface photometry in Paper I, where D_{25} can be read directly from the luminosity profiles (Fig. 5 in Paper I).

A comparison between D_{est} and D_{25} is plotted in Fig. 4. A least-squares fit to the observations yields

$$\log D_{\text{est}} = 0.99 \log D_{25} + 0.10, \qquad (3)$$

shown as a solid line in Fig. 4. The scatter about the correlation line is $\sigma(\log D) = 0.16$. Equation (3) shows that the D_{est} values are larger by $\sim 25\%$ than the D_{25} values. This means that the D_{est} diameters are measured to a fainter isophote, i.e., $\sim 25.5\, B$ mag/(arcsec)^2. An *upper* limit to the mean error of the *linear* diameters D_{est} is provided by the scatter in equation (3), which amounts to $\sim 40\%$.

Inspection of Fig. 4 shows that a linear fit to all galaxy types combined does not give a perfect representation. The brighter galaxies follow a slightly steeper relation as given in equation (3), whereas the dE's yield clearly a flatter relation. For dE's only, one obtains

$$\log D_{\text{est}}(\text{dE}) = 0.80 \log D_{25}(\text{dE}) + 0.25, \qquad (4)$$

which is the dotted line in Fig. 4.

The deviation from slope 1 in equation (4) is probably due to the fact that the D_{est} diameters must be systematic overestimates for very low surface brightness above 25 B mag/(arcsec)^2 (cf. Paper I, Fig. 11).

To demonstrate the usefulness of the D_{est} diameters, we have compared them with "effective apertures" A_e. We have actually used mean estimated diameters $\overline{D_{\text{est}}}$ for the comparison; they are defined by

$$\log \overline{D_{\text{est}}} = \log D_{\text{est}} - 1/2 \log R_{\text{est}}, \qquad (5)$$

where R_{est} is the estimated major-to-minor axis ratio from column 8. (Where no R_{est} value is available, it was taken to be one). The effective radii r_e or effective apertures $A_e \equiv 2r_e$ follow the notation of de Vaucouleurs *et al.* (1976, RC2) and are defined to contain half of the total luminosity of the gal-

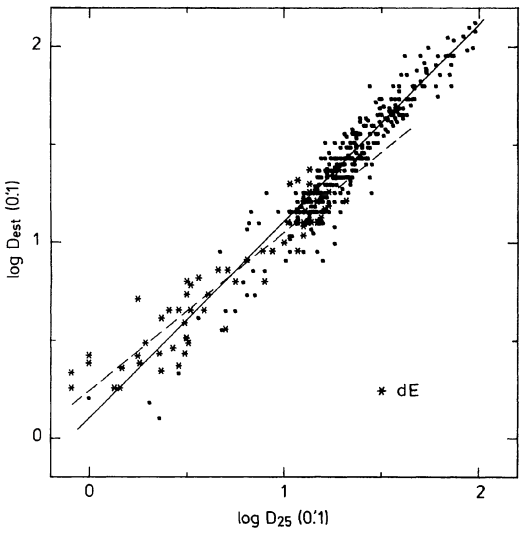

FIG. 4. Estimated diameters versus isophotal diameters at 25 B/(arcsec)^2. Both quantities are listed in column 7 of the catalog. dE galaxies are marked as asterisks. The solid line is a fit to all data, the broken line to dE's alone (see the text).

axy. Values r_e are available for the brighter galaxies from the RC2, for a variety of galaxies by Ichikawa *et al.* (1984), and for dE's from Paper I. A comparison log $\overline{D_{\rm est}}$ versus A_e (Fig. 5) shows considerable scatter for bright galaxies, but surprisingly little scatter for dE's. A line through the latter gives

$$\log \overline{D_{\rm est}}({\rm dE}) = 1.22 \log A_e({\rm dE}) + 0.15 \qquad (6)$$

over the range $0 < \log A_e \leqslant 0.9$ with a scatter about the line of $0.14(1\sigma)$. Equation (6) is the dotted line in Fig. 5. The formal mean error is not smaller than in equation (4), but to appreciate the usefulness of equation (6) one has to turn to Fig. 6, where we have plotted mean diameters log $\overline{D_{25}}$ versus log A_e. Figure 6 is nearly complementary to Fig. 4 in the sense that now the scatter is small for the bright galaxies and large for the dE's.

From this it is clear that D_{25} diameters are useful to derive the physically defined quantity A_e of *bright* galaxies, and that $D_{\rm est}$ diameters measure so much of their outer envelope that they correlate poorly with the more central quantity A_e. However, it is also clear that $D_{\rm est}$ is superior to D_{25} in determining A_e of *dwarf* ellipticals. In fact, D_{25} is increasingly difficult to measure for fainter dE's and becomes meaningless for the lowest-surface-brightness galaxies.

The effective surface brightness $\langle {\rm SB} \rangle_e$, which is the mean surface brightness within r_e, follows from

$$\langle {\rm SB} \rangle_e = B_T + 5 \log A_e + 0^{\rm m}.5, \qquad (7)$$

which—by inserting (5) and (6)—turns into

$$\langle {\rm SB} \rangle_e \simeq B_T + 4 \log D_{\rm est} - 2 \log R_{\rm est}. \qquad (8)$$

Allowing for a mean error of B_T of 0.5 mag, one obtains from equation (8) a mean error of $\langle {\rm SB} \rangle_e$ of 0.7 mag. With this scatter, the effective surface brightness $\langle {\rm SB} \rangle_e$ is still a useful parameter of dE's.

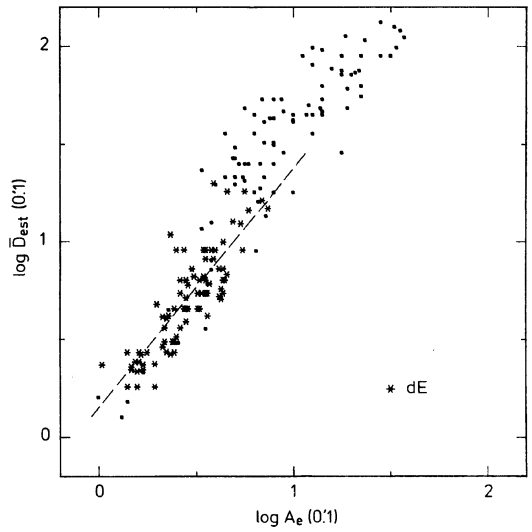

FIG. 5. Estimated mean diameters versus effective apertures A_e. The latter are from the RC2 or Paper I and are not given in the catalog. The broken line is a fit to the dE data (see the text).

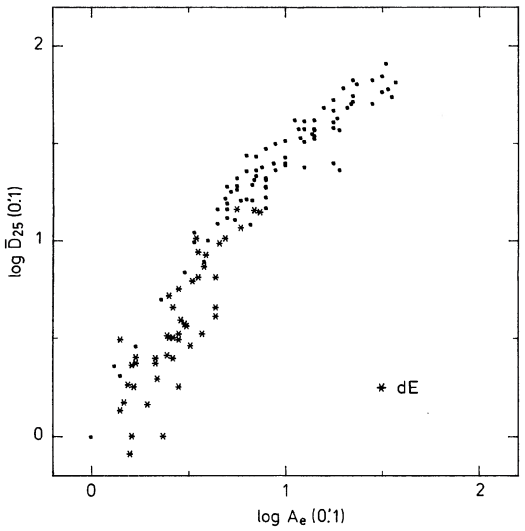

FIG. 6. Same as Fig. 5, but with D_{25} diameters instead of estimated diameters.

h) Axis Ratios (column 8)

Minor-axis diameters for the catalog galaxies were measured analogously to major-axis diameters discussed above; their ratio determines the major-to-minor axis ratios $R_{\rm est}$. The values log $R_{\rm est}$ are in the upper line of column 8. For faint, low-surface-brightness galaxies, only one *mean* diameter was measured, and the axis ratio was estimated on deep IIIaJ Schmidt plates by eye inspection including features of extremely low surface brightness, which could not be measured in any consistent way. In this case, the major diameter $D_{\rm est}$ was calculated backward from the mean diameter and $R_{\rm est}$. For the faintest galaxies ($B_T > 18$) in general no values of $R_{\rm est}$ are given.

The lower line of column 8 lists log R_{25}, where R_{25} is the axis ratio at 25 B /(arcsec)^2. These values are available for all Zwicky galaxies from estimates by DVP. Figure 7 is a comparison of log R_{25} with log $R_{\rm est}$. There is a slight systematic trend between the data in the sense that $R_{\rm est}$ values imply a higher degree of flattening. A least-squares solution gives

$$\log R_{\rm est} = 1.04 \log R_{25} + 0.05 \qquad (9)$$

over the range $0 < \log R_{25} < 1$, with a scatter about the line of $0.08(1\sigma)$.

i) Velocities (column 9)

The *heliocentric* velocities are weighted means from various sources. A key number in column 10 refers to the sources used, which are listed at the end of the catalog. The mean errors ϵ are compounded from the mean errors assigned to the different sources.

APPENDIX A: FINDING LISTS FOR OBJECTS IN VARIOUS OTHER GALAXY LISTS

It is the plague of astronomy that many different names are employed for the same object. In Table II(a), we have listed up to two names for the catalog galaxies (not counting the VCC members). This appendix gives further cross references for galaxy names and may help to find objects in the catalog with unusual designations.

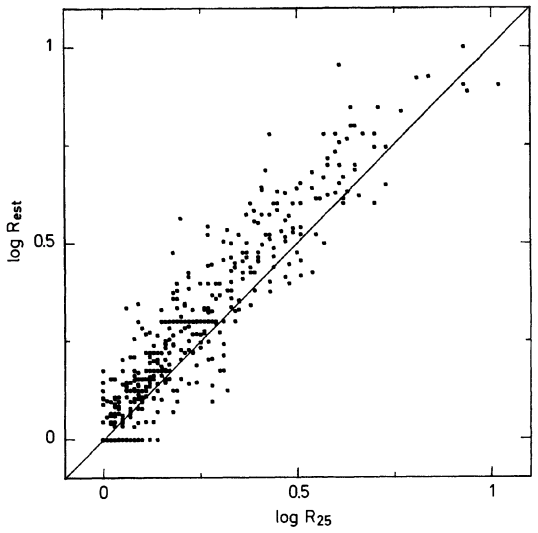

FIG. 7. Estimated axis ratios versus isophotal axis ratios at 25 B /s^2, both as listed in column 8 of the catalog. The line of identity is shown.

All Messier objects included in the catalog are listed in Table III. No such finding lists are needed for NGC and IC objects; they are easily extracted from Table II(a). The same holds for dwarfs with Reaves' designation, some of which, however, turned out to be plate flaws or to be lying in the background; they are not further considered here. For details, see Table XI of Appendix B, which is a comparison with Reaves' (1983) catalog of dwarf galaxies. Space was too limited in Table II(a) to include all UGC numbers; Table IV gives all UGC numbers which are not in Table II(a). Table V

TABLE III. Messier objects.

M	VCC	NGC
49	1226	= 4472
58	1727	= 4579
59	1903	= 4621
60	1978	= 4649
61	508	= 4303
84	763	= 4374
85	798	= 4382
86	881	= 4406
87	1316	= 4486
88	1401	= 4501
89	1632	= 4552
90	1690	= 4569
98	92	= 4192
99	307	= 4254
100	596	= 4321

TABLE IV. UGC objects[1)] listed by other names in Table II (a).

UGC	VCC	Names listed in Table 2	
7136	9	= IC 3019	= $14^{o}9$
7149	15	= IC 3021	= $13^{o}8$
7223	81	= NGC 4186	= $15^{o}11$
7227	83	= IC 3049	= $14^{o}13$
7231	92	= NGC 4192	= M 98
7249	119	= $13^{o}17$	= DDO 114
7254	126	= IC 3059	= $13^{o}21$
7274	155	= IC 3073	= $13^{o}22$
7285	170	= IC 3077	= $14^{o}16$
7312	218	= IC 3100	= $12^{o}16$
7339	275	= IC 3118	= $9^{o}9$
7345	307	= NGC 4254	= M 99
7355	322	= IC 3142	= $14^{o}22$
7415	490	= IC 783	= $16^{o}13$
7420	508	= NGC 4303	= M 61
7450	596	= NGC 4321	= M 100
7466	657	= NGC 4342	= IC 3256
7472	672	= NGC 4341	= IC 3260
7482	713	= NGC 4356	= IC 3273
7494	763	= NGC 4374	= M 84
7508	798	= NGC 4382	= M 85
7532	881	= NGC 4406	= M 86
7547	950	= IC 3356	= $11^{o}20$
7548	945	= IC 3355	= DDO 124
7629	1226	= NGC 4472	= M 49
7630	1217	= IC 3418	= DDO 130
7640	1261	= NGC 4482	= IC 3427
7654	1316	= NGC 4486	= M 87
7672	1386	= IC 3457	= $12^{o}64$
7674	1392	= IC 3459	= $12^{o}66$
7675	1401	= NGC 4501	= M 88
7692	1448	= IC 3475	= $13^{o}82$
7713	1524	= NGC 4523	= DDO 135
7733	1566	= IC 3517	= $9^{o}49$
7734	1567	= IC 3518	= $9^{o}50$
7737	1585	= IC 3522	= DDO 136
7739*	1581	= $6^{o}38$	= DDO 137
7760	1632	= NGC 4552	= M 89
7781	1678	= IC 3576	= $6^{o}41$
7786	1690	= NGC 4569	= M 90
7795	1726	= $7^{o}43$	= DDO 139
7796	1727	= NGC 4579	= M 58
7814	1779	= IC 3612	= $15^{o}60$
7822	1791	= IC 3617	= DDO 140
7830	1828	= IC 3635	= $13^{o}105$
7834	1857	= IC 3647	= $10^{o}60$
7855	1890	= IC 3665	= $11^{o}56$
7858	1903	= NGC 4621	= M 59
7863	1910	= IC 809	= IC 3672
7881	1945	= NGC 4637	= $11^{o}60$
7888	1949	= NGC 4640	= $12^{o}98$
7889	1955	= NGC 4641	= $12^{o}99$
7898	1978	= NGC 4649	= M 60
7919	2008	= IC 3720	= $12^{o}102$
7927	2012	= IC 3727	= $11^{o}68$

* = Ho VII as well (Holmberg 1950)

[1)]UGC galaxies (Nilson 1973) in the surveyed area *not* included in the VCC: 7347, 7588, 7652, 7948—four faint non-Zwicky galaxies in the background. Otherwise the VCC is complete with respect to UGC objects.

is a list of all DDO dwarf galaxies included in the catalog.

For the anonymous Zwicky galaxies, we have not employed the often-used designation A followed by the position. With Zwicky galaxies so densely populating the sky, many A's would bear the same name. Therefore, we merely marked by a "Z" (column 1 of Table II(a)) the galaxies in Zwicky *et al.*'s (1961–1963) CGCG and present here in Table VI a finding list of all anonymous Zwicky galaxies with coordinates as given in the CGCG. This should prevent any confusion.

Table VII lists the few Markarian and Zwicky compact galaxies included in the catalog, and the blue compact objects from the lists of RMB, BB, and Bö that have no NGC or IC number. Finally, Tables VIII–X are finding lists for Caldwell's (1983) dwarf galaxies, and dwarfs that were still lacking a definitive name in our previous Papers I and III, respectively. We suggest that for these objects, where no NGC, IC, or Reaves number can be given, the VCC designation is adopted. This might help to reduce the nomenclature plague mentioned in the beginning of this appendix.

TABLE V. DDO dwarf galaxies (van den Bergh 1959).

DDO	VCC	UGC	Other names	
114	119	= 7249*	= $13^{\circ}17$	
115*	126	= 7254*	= IC 3059	= $13^{\circ}21$
124	945	= 7548*	= IC 3355	
128	1156	= 7612		
130	1217	= 7630*	= IC 3418	
132*	1448	= 7692*	= IC 3475	= $13^{\circ}82$
135	1524	= 7713*	= NGC 4523	
136	1585	= 7737*	= IC 3522	
137	1581	= 7739*	= $6^{\circ}38$	= Ho VII*
138*	1678	= 7781*	= IC 3576	= $6^{\circ}41$
139	1726	= 7795*	= $7^{\circ}43$	
140	1791	= 7822*	= IC 3617	
145*	2008	= 7919*	= IC 3720	= $12^{\circ}102$

* Not listed by this name in Table 2

TABLE VI. Zwicky anonymous galaxies (galaxies in the CGCG—Zwicky *et al.* 1961–1963, without NGC or IC number).

CGCG coordinates	VCC	Other names	CGCG coordinates	VCC	Other names
12 05.8 13 57	1		12 13.1 8 34	159	
12 06.3 9 24	6		12 13.4 4 56	172	
12 07.2 12 24	12		12 13.4 13 29	165	
12 08.1 12 04	24		12 13.4 14 42	170	= IC 3077, $14^{\circ}16$
12 08.2 16 09	28				
12 08.4 9 29	31		12 13.5 8 29	173	= $8^{\circ}6$
12 09.5 15 11	40		12 13.7 8 12	180	
12 09.5 15 41	39	= UGC 7196	12 13.8 11 05	186	
12 09.7 12 45	48	= $12^{\circ}9$, UGC 7200	12 13.8 15 32	189	
			12 13.9 14 46	194	
12 09.8 9 03	53		12 14.0 13 19	200	
12 09.9 15 40	54		12 14.4 8 38	210	
12 10.0 15 33	56	= UGC 7210	12 14.7 9 14	227	= $9^{\circ}6$, UGC 7314
12 10.1 10 18	62				
12 10.2 11 50	64		12 14.8 13 04	228	
12 10.6 16 22	75		12 15.2 4 46	256	
12 11.1 15 44	87		12 15.2 13 27	249	***
12 11.1 16 24	86	= UGC 7230	12 15.3 6 09	262	
12 11.5 7 00	99		12 15.5 5 58	270	
12 11.6 8 03	105	= $8^{\circ}5$, UGC 7237	12 15.5 16 14	269	
			12 15.6 7 56	277	= $7^{\circ}13$
12 11.6 13 52	102		12 15.7 6 53	278	
12 11.6 14 26	103	*	12 15.7 11 11	272	
			12 16.0 7 00	297	
12 11.6 15 00	101	= NGC 4192B, UGC 7240, **	12 16.2 13 13	298	
			12 16.5 6 22	315	
12 12.1 13 05	119	= $13^{\circ}17$, DDO 114	12 16.6 4 08	324	= UGC 7354, Mark 49
12 12.3 13 15	121		12 16.6 6 40	327	
12 12.3 13 35	123		12 16.7 6 34	331	
12 12.6 4 51	141		12 16.7 6 35	332	
12 13.1 8 25	161	= UGC 7273	12 16.8 6 11	340	

TABLE VI. (continued)

CGCG coordinates		VCC	Other names	CGCG coordinates		VCC	Other names
12 16.8	12 21	347		12 20.3	3 24	588	
12 16.9	5 19	351		12 20.4	3 02	597	
12 17.3	7 16	377		12 20.9	6 05	641	
12 17.3	8 00	380		12 21.1	3 14	662	= UGC 7464
12 17.4	17 53	370		12 21.2	9 36	665	
12 17.5	8 06	392		12 21.3	3 21	675	
12 17.5	8 53	385	= UGC 7383	12 21.3	4 22	670	
12 17.6	6 55	397		12 21.4	5 27	693	
12 17.6	8 55	395		12 21.4	9 31	682	
12 17.7	4 29	404		12 21.5	5 35	690	
12 17.7	8 49	406		12 21.6	9 39	700	
12 17.8	7 11	415		12 21.6	9 45	720	
12 17.8	17 38	400		12 21.7	4 30	710	= Mark 51
12 18.3	17 18	435		12 21.7	9 37	718	
12 18.3	17 46	437		12 21.8	13 19	723	
12 18.5	7 21	450		12 21.9	13 31	729	
12 18.7	17 55	459		12 22.0	7 00	734	
12 19.0	5 03	482	= NGC 4301 UGC 7411	12 22.1	3 35	739	
				12 22.1	4 16	737	
12 19.1	16 15	485		12 22.2	7 38	745	= NGC 4366
12 19.4	2 37	513		12 22.3	7 02	750	
12 19.4	5 23	517	= UGC 7422	12 22.3	9 04	749	
12 19.4	6 43	509	= UGC 7423	12 22.5	5 37	764	
12 19.4	8 57	514	= 8°19 UGC 7424	12 22.6	4 45	770	
				12 22.9	9 09	822	
12 19.6	5 14	531		12 23.0	3 43	805	
12 19.6	6 23	528		12 23.1	2 27	826	= UGC 7512
12 19.8	15 02	543	= UGC 7436	12 23.1	7 30	827	= IC 3322A UGC 7513
12 19.9	4 50	552	= NGC 4303A UGC 7439				
				12 23.1	9 18	831	
12 20.1	3 25	572		12 23.2	4 47	834	= UGC 7516
12 20.1	5 55	573		12 23.3	6 05	848	
12 20.1	6 30	568		12 23.3	9 13	847	
12 20.1	8 14	571		12 23.4	3 42	859	= UGC 7522

TABLE VI. (continued)

CGCG coordinates	VCC	Other names
12 23.5 4 45	858	
12 23.7 5 45	885	
12 23.9 8 20	908	
12 24.0 16 55	911	
12 24.0 17 07	918	
12 24.2 9 19	934	
12 24.3 16 33	947	
12 24.5 9 13	961	
12 24.6 7 32	975	= 7°27, UGC 7557
12 24.6 9 58	981	
12 24.8 3 34	1007	= UGC 7564
12 24.9 3 32	1016	
12 24.9 7 55	1011	= 7°29, UGC 7567
12 24.9 8 15	1019	
12 25.4 4 34	1058	
12 25.4 6 00	1048	= UGC 7579
12 25.4 8 22	1049	= UGC 7580
12 25.6 10 03	1078	
12 25.7 7 06	1080	
12 25.7 7 53	1084	
12 25.8 9 00	1091	= UGC 7590
12 26.0 8 54	1114	= 8°30, UGC 7596
12 26.3 4 34	1138	= UGC 7607
12 26.3 6 25	1134	
12 26.4 8 08	1152	
12 26.5 3 00	1156	= DDO 128, UGC 7612
12 26.7 9 09	1172	= 9°40
12 26.7 10 24	1175	
12 27.1 3 54	1208	
12 27.1 9 46	1206	
12 27.5 8 12	1249	= 8°33, UGC 7636
12 27.6 3 51	1262	
12 27.6 16 39	1258	
12 27.7 2 54	1266	= UGC 7642
12 27.7 8 47	1270	
12 27.8 4 01	1284	= UGC 7644
12 28.4 3 46	1322	
12 28.4 12 33	1327	= NGC 4486A, UGC 7658
12 28.6 4 52	1339	
12 28.7 5 21	1347	
12 29.9 12 04	1429	= UGC 7686
12 29.9 16 35	1428	= II Zw 65
12 30.0 8 19	1435	= 8°38, UGC 7688
12 30.0 9 26	1437	
12 30.3 3 34	1456	
12 30.3 6 04	1458	
12 30.6 8 06	1480	
12 30.9 4 04	1507	
12 30.9 8 57	1501	= NGC 4519A
12 30.9 13 32	1504	
12 31.3 8 18	1525	
12 31.4 3 49	1529	= UGC 7715
12 31.6 16 14	1542	= IC 3505
12 32.0 6 17	1568	
12 32.2 6 34	1581	= 6°38, DDO 137
12 32.2 9 17	1579	
12 32.5 5 42	1597	
12 32.5 6 09	1598	
12 32.7 6 49	1607	
12 33.0 6 36	1617	

TABLE VI. (continued)

CGCG coordinates	VCC	Other names
12 33.2 3 29	1638	
12 33.2 11 58	1633	
12 33.2 14 41	1636	
12 33.3 6 02	1643	
12 33.6 5 21	1653	
12 34.0 6 27	1671	
12 34.0 8 19	1675	
12 34.1 3 23	1685	= UGC 7780
12 34.2 4 23	1687	
12 34.6 5 42	1701	
12 34.9 5 01	1713	
12 35.1 8 50	1725	
12 35.2 7 23	1726	= 7°43 DDO 139
12 35.3 14 33	1737	****
12 35.7 8 05	1748	
	1752	
12 35.8 8 10	1758	= UGC 7802
12 35.9 9 48	1759	
12 36.0 14 38	1765	= IC 3609
12 36.3 7 24	1774	
12 36.8 5 13	1789	
12 36.9 4 33	1793	
12 37.1 7 27	1802	
12 37.3 4 05	1810	
12 37.6 5 39	1824	
12 37.8 16 12	1833	
12 37.9 5 19	1842	
12 37.9 8 27	1838	
12 38.0 2 45	1847	
12 38.0 5 38	1845	
12 38.3 4 48	1855	
12 38.8 6 58	1875	
12 38.9 12 31	1886	
12 39.3 9 41	1895	= UGC 7854
12 39.4 9 51	1896	
12 39.4 14 03	1897	= UGC 7857
12 39.6 5 48	1908	
12 39.9 2 19	1920	
12 40.2 9 47	1936	
12 40.2 13 32	1931	
12 40.3 10 57	1948	= 10°62
12 40.4 3 57	1947	
12 40.6 3 51	1956	
12 40.7 4 21	1959	
12 40.8 3 49	1962	
12 41.0 10 22	1970	= 10°63
12 41.4 3 53	1984	
12 41.7 13 13	1993	
12 42.2 10 02	2005	
12 42.7 10 28	2018	= 10°67
12 42.8 9 22	2020	
12 43.5 8 45	2033	
12 44.1 9 35	2042	= 9°65 UGC 7942
12 44.1 12 10	2041	
12 45.3 10 09	2055	
12 46.0 10 50	2073	
12 46.1 9 24	2076	
12 46.1 11 11	2077	
12 47.5 11 32	2082	
12 47.8 10 49	2038	= 10°78

* Not = IC 3053 as in CGCG (instead, VCC 95 = IC 3053)

** Not = NGC 4186 as in DVP (VCC 81 is NGC 4186)

*** Declination wrong in CGCG and DVP

**** Not = IC 3609 as in CGCG (instead, VCC 1765 = IC 3609)

TABLE VII. Markarian galaxies and compact objects from the lists of Zwicky and others.[1)]

Object	VCC	Other names
Mark 49	324	= UGC 7354
Mark 51	710	
I Zw 38	1297	= NGC 4486 B
II Zw 65	1428	
III Zw 65[2)]	778	= NGC 4377 = UGC 7501
RMB 46	841	= BB 135
RMB 56	334	
RMB 132	1313	
RMB 169	410	
RMB 175	562	= $12^{o}28$
BB 18	428	
BB 135	841	= RMB 46
Bo" 113	328	= $13^{o}29$
Bo" 146	802	= $13^{o}46$

Mark = Markarian (1967-69)
Zw = Zwicky (1971)
RMB = Rubin, Moore, and Bertiau (1967)
BB = Barbieri and Benvenuti (1974)
Bo" = Borngen (1983)

1) There are many more RMB, BB, and Bo" objects included in the VCC than given in this list, but all of those have an NGC or IC number. For a complete cross reference consult directly RMB, BB, Bo", and also Karachentsev and Karachentseva (1982).

2) Not listed by this name in Table 2. Actually, III Zw 65 =: NGC 4377 + 2 close companions (Zwicky 1971), but the 2 "companions" are not included in the VCC since they are probably in the background.

TABLE VIII. Caldwell's dwarfs (Caldwell 1983).

Caldwell's list	VCC	Other names	Caldwell's list	VCC	Other names
M 87 DW 1	1407	= IC 3461	N 4472 DW 4	1333	= $8^{o}35$
M 87 DW 3	1420	= $12^{o}71$	N 4472 DW 5	1120	= $8^{o}31$
M 87 DW 6	1348	= IC 3443	N 4472 DW 6	1049	= UGC 7580
M 87 DW 7	1185	= $12^{o}52$	N 4472 DW 7	1203	
M 87 DW 8	1389		N 4472 DW 8	1254	= $8^{o}34$
M 87 DW 10	1399	= $12^{o}67$	N 4472 DW 9	992	= $8^{o}27$
M 87 DW 11	1386	= IC 3457, $12^{o}64$	N 4472 DW 10[1)]	1435	= $8^{o}38$
M 87 DW 12	1352				
M 87 DW 22	1075	= IC 3383, $10^{o}32$	N 4328 CH 1*	634	= NGC 4328
			IC 783 CH 2*	490	= IC 783
M 87 DW 27	810	= $13^{o}45$	M 100 CH 3*	545	= IC 783A
M 87 DW 28	729		M 100 CH 5*	636	
M 87 DW 31	1539	= $13^{o}87$	M 100 CH 6*	510	= $15^{o}27$, UGC 7425
N 4472 DW 1	1107	= $7^{o}31$			
N 4472 DW 2	1151	= $7^{o}33$	Field DW 5	1947	

1) Right Ascension wrong in Caldwell (1983)

* Coordinates 1980 in Caldwell (1983), shifted by constant Δ R.A. = + $1^{m}.53$ and ΔDec = $-10'.2$

TABLE IX. Galaxies having no definitive name in Paper I (Binggeli *et al.* 1984)

Preliminary name in Paper I	VCC	Preliminary name in Paper I	VCC
R 2	833	R 48	1157
R 4	903	R 50	1310
R 5	892	R 56	*
R 7	977	----	
R 8	997	X 2	*
R 9	978	X 3	1447
R 10	942	X 4	1445
R 11	967	X 5	*
R 13	1083	X 6	1531
R 14	1014	X 7	1527
R 16	1037	X 8	1560
R 19	1069	X 9	1578
R 21	1161	X 10	1558
R 23	1219	X 11	1594
R 24	1229	X 14	1548
R 25	1251	X 15	1595
R 31	1343	X 16	1621
R 32	1341	X 19	1680
R 33	1340	X 22	1710
R 39[1)]	1317	-----	
R 40	1271	S 19	636
R 41	1300	-----	
R 43	1068	Anon	1633
R 45	1111	(12 33.15)	
R 47	1077		

* Not included in VCC - faint background galaxy

1) Declination wrong in Paper I

TABLE X. Galaxies having no definitive name in Paper III (Sandage and Binggeli 1984).

Preliminary name in Paper III	VCC	Other name
[VF17 - E1]	1627	
[A1239 + 12]	1886	
[VF18 - R71]	1052	
[VF18 - R73]	884	
[VF18 - R2][1)]	833	
[VFb - 12]	794	= UGC 7504
[A1239 + 09]	1896	
[A1211 + 15]	87	
[A1231 + 03]	1529	= UGC 7715
[A1236 + 05]	1789	
[VF44 - 7]	cancelled (background)	
[A1212 + 06]	144	
[A1230 + 09]	1437	
[A1243 + 08]	2033	
[VF67 - 12]	1572	
[A1223 + 06]	848	
[A1235 + 08]	1725	

1) Right Ascension wrong in Paper III

APPENDIX B: COMPARISON WITH REAVES' (1983) CATALOG OF VIRGO DWARF GALAXIES

In the early 1950s, as mentioned in the Introduction, Reaves performed the first survey of Virgo cluster dwarf galaxies on Lick astrograph plates. He detected some 70 faint, low-surface-brightness galaxies—the long-suspected dwarf members of the Virgo cluster (Reaves 1956). About 25 years later, Reaves began a new survey of VC dwarfs, based on long-exposure IIIaJ Palomar Schmidt plates taken by Sandage, resulting in a catalog of 846 dwarf galaxies in the Virgo cluster region (Reaves 1983). This survey was a most valuable aid for the present work. In fact, we used the same IIIaJ Schmidt plates in parallel with the large-scale du Pont plates. The data given in Table II(a) are based on the du Pont plates, however, and this appendix is to compare our data with Reaves' Schmidt data for the same galaxies. This is done below for magnitudes, diameters, and types, after a comparison of our samples is given.

1) Survey Areas And Samples

The sky area surveyed by Reaves is confined within $11^h52^m < \alpha < 13^h05^m$ and $6° < \delta < 17°$—which has to be compared with the Las Campanas survey area shown in Figs. 1 and 2. Reaves' survey area is an E-W strip containing about 200 deg^2, while ours is more like a N-S strip of about 140 deg^2. About 80% of the Las Campanas survey area is covered by Reaves' survey, excluding only the Southern Extension ($\delta < 6°$) and a tip in the north ($\delta > 17°$).

Of the 846 dwarfs listed in Reaves (1983), 643 fall within the confines of the Las Campanas survey. However, the final number of Reaves' dwarfs included in the catalog of Table II(a) is 594; 49 "dwarfs" had to be rejected because on the large-scale plates they turned out to be background galaxies or plate flaws. However, this still is a remarkable agreement that shows how well the dwarfs can be distinguished on deep (though small-scale) Schmidt plates. The details of the comparison are given in Table XI.

It should be noted that we list many more dwarfs in the common survey area than Reaves does, for two reasons. First, Reaves chose to adopt a lower limit of 0'.3 for the major-axis diameter. Smaller objects show no structural features on the small-scale Schmidt plates, thus he did not include them in his catalog. Second, the deep IIIaJ Schmidt plates are excellent for detecting very low-surface-brightness objects (which indeed dominate the VC population), but they are useless for a search for high-surface-brightness dwarfs, because even galaxies of moderately high surface brightness have completely burned out images on the Schmidt plates. Hence Reaves' (1983) catalog is biased toward low-surface-brightness dwarfs.

2) Magnitudes

The photometric work published in Paper I was motivated by the need for standard magnitudes in the range $15 < B_T < 20$, based on which the magnitudes of the dwarf ellipticals and irregulars could be estimated by eye on the du Pont plates with an accuracy of $\lesssim 0.5$ mag. Reaves was lacking faint standard magnitudes and was forced to adopt an indirect procedure for calibrating his eye estimates. Based on some preliminary results of our photometry, however, his first magnitude calibration turned out to be in error, whereupon he called his estimated magnitudes "steps" and gave an adequate formula for converting steps into magnitudes.

TABLE XI. Reaves dwarfs covered by the Las Campanas survey.

Decl.Zone	Numbers	Not included in the VCC: Background[1]	Not included in the VCC: Not real
6°	6 ÷ 47	6,9,10,11,46	
7°	5 ÷ 51	14	41
8°	4 ÷ 53	4,13,40,41,50	11,14,46,47
9°	2 ÷ 68	7,23	
10°	6 ÷ 80 excl.76,79	14,16,18,54,70,74	21[2]
11°	6 ÷ 73		9,10,16,71
12°	9 ÷ 108	24,26,37	(80,81)[3]
13°	7 ÷ 113	13,53	31,79[4]
14°	8 ÷ 69	30,45,52	
15°	5 ÷ 64	5,14,17,45	
16°	11 ÷ 41 + 4,7,9,43,46	9,11,23,26	

1) 10°67 and 13°8 are in the background, but being in the Zwicky Catalog they are included in the VCC

2) May be a lump of the very large dwarf VCC 811

3) Both real but belonging to M89 (tidal material; see Figure 1h in Schweizer 1983)

4) 13°79 = 12°62

In Fig. 8, we have plotted Reaves' magnitudes, or steps, against out B_T values listed in Table II(a). For each step ($m > 16$), we have calculated the mean B_T and the standard deviation in B_T, which appears as an error bar in Fig. 8. Also shown, as a broken line, is Reaves' proposed transformation equation:

$$m = 17 + 0.5(\text{step} - 17). \quad (10)$$

The zero point of this relation, if $m = B_T$, is ~ 0.5 mag too faint, while the slope is approximately correct. An improved version of equation (10) would therefore be

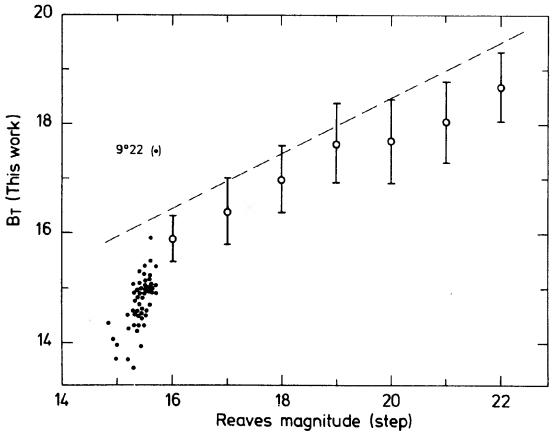

FIG. 8. B_T values, or mean B_T's, of this work compared with Reaves' magnitudes, or steps, respectively, for dwarf galaxies in common. The dwarf 9°22 was probably misidentified by Reaves. The broken line is Reaves' equation to transform steps into magnitudes (see the text).

$$B_T = 16.5 + 0.5(\text{step} - 17)$$
$$= 8 + 0.5\ \text{step}, \quad (11)$$

which could be used to convert steps into B_T for those ~ 200 dwarfs listed in Reaves (1983) that are outside the area covered by the Las Campanas survey. Alternatively, the same magnitudes can be obtained by reading off the mean B_T's in Fig. 8.

For magnitudes brighter than 16, where Reaves used standard magnitudes from the Zwicky *et al.* catalog (CGCG), there is considerable disagreement, as Fig. 8 clearly shows. Part of the problem must lie in the fact that Reaves used the *uncorrected* Zwicky magnitudes, which are known to be too faint in the mean by ~ 0.4 mag. Furthermore, one tends to underestimate the *total* brightness of dwarfs by using high-surface-brightness galaxies in the background (which most faint Zwicky galaxies are) as the photometric standard. However, it is not quite clear how this could explain the steep slope of the $m - B_T$ relation for $m < 16$ in Fig. 8.

3) Diameters

Reaves measured major angular diameters for his objects on the Schmidt plates by means of an eyepiece with a reticle in units of 0.1 mm. We used a scale without an eyepiece—the large size and comparatively low surface brightness of galaxies on the du Pont plates does not call for magnification. Figure 9 is a plot of our estimated diameters, $\log D_{\text{est}}$, as listed in Table II(a), versus Reaves' diameters, $\log a$. On average, our diameters are larger by a factor of ~ 1.6 ($\Delta \log D \sim 0.2$). This means that the surface-brightness level at which Reaves measured his diameters is roughly 1 mag brighter than ours, i.e., $\sim 24.5\ B/(\text{arcsec})^2$ versus $\sim 25.5\ B/(\text{arcsec})^2$.

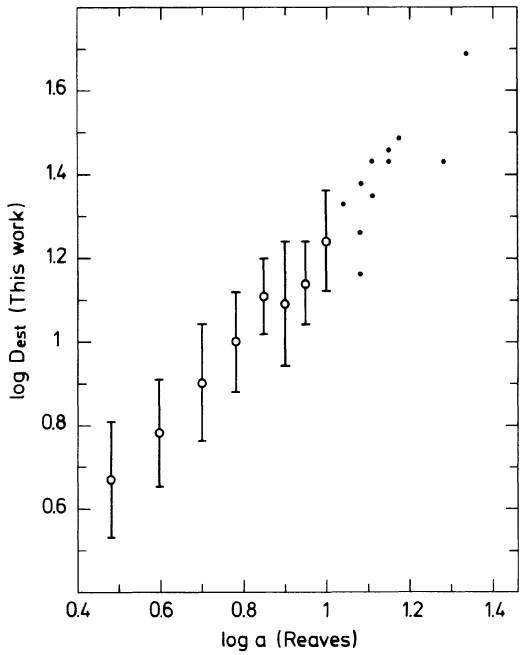

FIG. 9. (Mean) estimated diameters of this work versus Reaves' estimated diameters.

4) Types

The classification system that we used for dwarf galaxies was set out and illustrated in Paper III. Reaves employed his own, somewhat different classification system to assign morphological types to his dwarfs. In the following we describe briefly how the dwarf types correspond with each other in the two systems.

There is no ambiguity with respect to Reaves' "E" dwarfs. They are all what we call dE, with very few exceptions. Reaves' "I" (or IC 3475) galaxies are mainly extended, low-surface-brightness dE's or Im's in our system, but mixed into the wide "I" class are also most of our dS0 galaxies and other types. The few "dIrr" galaxies of Reaves are all really clumpy Im's in our terminology. Finally, there are Reaves' "dwarf spirals" (dSp)—an unfortunate term, for there *are no* true dwarf spirals, as argued at length in Papers III, IV, and V. Reaves "dSp" class just encompasses the faint end of the luminosity distribution of normal spiral galaxies—which at the same time is the "late end" of the revised Hubble sequence: Sc-Sd-Sm.

APPENDIX C: DWARF GALAXIES OF SPECIAL INTEREST

This appendix refers to Paper III, the dwarf atlas, in which we have listed and illustrated a representative sample of Virgo cluster dwarf galaxies. The full sample of VC dwarfs is now of course available from the catalog in Table II(a). However, there are some interesting and new dwarf types, some of which are not easy, or impossible to recognize in Table II(a)—that are worth listing separately here—as announced in Paper III.

1) High-Surface-Brightness Dwarfs

There are two dwarf types: the blue compact dwarfs (BCD) and the low-luminosity E galaxies, that are characterized by a high surface brightness at a given magnitude, in sharp contrast to the majority population of dwarfs consisting of dE, dS0, and Im types. Albeit low surface brightness is a unique indicator of cluster membership for typical dwarf galaxies, this morphological criterion cannot be used for BCD's and faint compact E galaxies. They cannot be distinguished from giant background galaxies with any degree of certainty. The relatively rare certain cluster members of these two types were assigned to the cluster exclusively on the basis of their redshifts. The experience gained from their appearance was used to make an additional search on all Las Campanas plates, as explained in Paper III, for possible high-surface-brightness dwarf members of the cluster. Many such candidates were found, and they are included in the catalog as possible members. However, there is no doubt that many of these objects will eventually turn out—when redshift data become available—to be background galaxies.

Tables XII and XIII list all BCD and compact E dwarf candidates, respectively. We believe the lists are complete down to $B_T \sim 18$. Also included are the prototypes, i.e., the certain members of the class. Due to their high surface brightness, these dwarfs are easy objects for spectroscopy. Hence Tables XII and XIII are observing lists for future redshift surveys.

2) Blue Compact Dwarfs In Particular

Despite the fact that only the velocity can discriminate a BCD against the background, there are four (not two as stated in Paper III) cases which are classified "BCD" without any velocity data, simply on the basis of their exceptionally convincing morphological appearance; viz. VCC 380, 541, 1459, and 1572; the latter three galaxies are lying in the Southern Extension ($\delta < 5°$) and thus are not classified as members ("M"). On the other hand, VCC 10, 172, and 324, despite their velocity, do not appear as certain members because they are either in the M cloud region or in the Southern Extension. The unambiguous BCD types are mostly from the surveys of RMB, BB, and Bö; they are illustrated in Paper III. The candidates are classified "BCD?", or frequently also "BCD or merger", meaning the galaxy is either a BCD in the cluster, or it is a merger in the background

3) The Faint Compact E (M32-Type) Galaxies

Still greater problems than those posed by the BCD's are posed by the low-luminosity E galaxies as to their cluster relationship. For this class, M32 in the Local Group may stand as a prototype. Due to their high surface brightness, these galaxies are virtually indistinguishable from E giants in the background. The possible significance of such a compact dwarf class was discussed by Wirth and Gallagher (1984), who advocate the existence of two distinct branches of intrinsically faint galaxies of the E class: (1) compact E (M32-type) dwarfs that form the low-luminosity tail of the normal, giant E population; and (2) the fuzzy, low-surface-brightness dE that were not of the true E kind initially, but are now the *d*ead *e*nds (= dE) of star-forming disk galaxies that were deprived of their gas by some environmental mechanism when falling through the cluster core.

While there is much to say in favor of the existence of two E sequences of entirely different origin, we find surprisingly little overlap of the two in absolute magnitude. Table XIII is a complete list of certain members *and* candidates of the compact, low-luminosity ($B_T > 14$) E class that were found

TABLE XII. Blue compact dwarf (BCD) galaxies and candidates.

VCC	Other names	Type	B_T	VC memb.	v_{Helio} (km/s)	VCC	Other names	Type	B_T	VC memb.	v_{helio} (km/s)
3		BCD?	17.5	-		562*	$12^{o}28$ / RMB 175	BCD	16.6	M	44
10	IC 3017	BCD:	14.75	-	1944						
14		BCD?	16.5	-		580		BCD?	17.2	-	
19		BCD?	16.5	-		641		BCD?	15.08	-	
22		BCD?	16.0	-		741		BCD?	15.5	-	
24		BCD	14.95	M	1281	772		BCD?	17.0	-	
45		BCD?	16.0	-		802*	$13^{o}46$ / Bo 146	BCD	17.4	M	-215
74		BCD?	16.3	-							
102		BCD or merger	15.04	-		841*	RMB 46 / BB 135	BCD	16.7	M	462
116		BCD?	17.2	-							
130		BCD?	16.5	-		890		BCD?	16.0	-	
144*		BCD	15.31	M	1960	895		BCD?	17.0	-	
148		BCD or S	15.3	-		1141		BCD?	16.2	-	
172		BCD:	14.5	-	2167	1174		BCD?	15.5	-	
196		BCD?	16.5	-		1258		BCD or merger	15.30	-	
202		BCD?	16.0	-		1262		BCD?	15.1	-	
207		BCD?	17.2	-		1313*	RMB 132	BCD	16.8	M	1250
213*	IC 3094 / UGC 7305	dS?/BCD?	14.44	M	-169	1362		BCD?	17.2	-	
						1423		BCD?	16.0	-	
223		BCD?	16.5	-		1437*		BCD	15.7	M	1576
225		BCD?	17.0	-		1459		BCD:	16.3	-	
274	$6^{o}12$	BCD?	17.5	-		1460		BCD?	16.5	-	
281	IC 3120	dS0 or BCD	15.3	M	203	1471		BCD or merger	16.5	-	
324*	UGC 7354 / Mark 49	BCD	14.78	-	1582	1544		BCD or merger	17.0	-	
						1572*		BCD	16.0	-	
334*	RMB 56	BCD	16.2	M	-250	1583		BCD?	16.5	-	
340		BCD or merger	14.43	-		1744		BCD?	17.5	-	
380		BCD	15.2	M		1750		BCD?	16.5	-	
410*	RMB 169	BCD	17.1	M	272	1849		BCD?	16.2	-	
428*	BB18	BCD	17.5	M	790	1944		BCD?	18.0	-	
459		BCD	14.95	M	2107	2015	$10^{o}68$	BCD?	16.2	-	
464		BCD?	17.5	-		2033*		BCD	14.65	M	1486
468		BCD?	16.0	-		2089		BCD?	17.5	-	
513		BCD?	15.1	-		2096		BCD or merger	15.8	-	
541		BCD	16.0	-							

* Illustrated in Paper III

in the Virgo cluster down to $B_T \sim 18$. In this magnitude range, the handful of M32's is vastly outnumbered by the dE types. In fact, most of the low-luminosity E's might be formerly *bright* E galaxies that were tidally stripped by some massive neighbor (as possibly M32 was by M31). For that reason, the presence of a close (in projection) massive neighbor, that may have done the tidal stripping, is indicated in the last column of Table XIII. If one takes further into account that several candidates will eventually turn out to be E giants in the background, there may be vanishingly little overlap in absolute magnitude between dE's and the genuine faint E galaxies. The two sequences of the E family seem to merge smoothly in their photometric (and physical?) properties at an absolute magnitude of $M_{B_T} \sim -20$, as shown in Paper I (see, however, the criticism of Kormendy 1985, and the disconnected luminosity functions of the two E sequences shown in Paper V). We note that the situation may be different in the Fornax cluster of galaxies where apparently a larger population of M32-type galaxies was found (Wirth and Gallagher 1984).

4) The Very-Large-Size, Low-Surface-Brightness Dwarfs

The "very-large-size, low-surface-brightness dwarfs" are an entirely different species of galaxies which were introduced as a new dwarf class in Paper III. No new type designation was introduced, however, because these galaxies look simply like oversized, but otherwise normal irregulars of dwarf ellipticals, which have particularly low surface brightness for their luminosities. Thus they are classified as "Im" or "dE"; often also as "dE or Im" since the distinction between early- and late-type dwarfs is very difficult at a faint surface-brightness level (see Paper III). Consequently, these interesting dwarf types are hard to single out from the catalog in Table II(a), which is the reason why we list them separately here in Table XIV. Note, however, that the dwarfs listed are not necessarily those of largest size or lowest surface brightness contained in the catalog, although the corresponding objects can be extracted easily from Table II(a).

Rather, these galaxies were directly selected during plate inspection. Many of them come from the inspection of the deep IIIaJ Schmidt plates, where they stand out particularly well. Hence the sample given in Table XIV is morphologically (or, if the reader prefers, subjectively) defined. The really huge dwarfs were discussed as a new type in Paper III; they are marked in Table XIV by an underlined VCC number. The remaining galaxies may be normal Im's or dE's which

TABLE XIII. Compact, low luminosity E (M32-type) galaxies and candidates.

VCC	Other names	Type	B_T	VC memb.	v_{Helio} (km/s)	lying close to...
32	IC 767	E4	14.3	-	1894	
43	NGC 4164	E3	15.3	-		
154		E(0,3)or S0	16.5	-		NGC 4212
344		E2	15.3	-		NGC 4261
351		E7	14.92	-		
538		E0	15.4	-		NGC 4309
916		d:E1,N:	15.3	M	1349	several bright galaxies
1035		E4	16.0	-		
1068		E2	15.85:	-		IC 794
1148		E0	15.7	-		
1175		$E5/S0_1(s)$	15.1	M	70	
1192	NGC 4467	E3	15.05	M	1474	NGC 4472
1199		E2	15.5	-		NGC 4472
1297*	NGC 4486B I Zw 38	E1	15.11	M	1486	NGC 4486
1440	IC 798	E0	14.92	M	414	
1545	IC 3509	E4	14.75	M	2050	
1570		E3	16.0	-		
1627*		E0	15.5	M	249	~NGC 4451/2
1665		E4	15.3	-		~NGC 4451/2
1922		E0?	17.5	-		NGC 4633
1993		E0	15.3	-		NGC 4654

* Illustrated in Paper III

TABLE XIV. Dwarfs of very large size and low surface brightness.

VCC	Other names	Type	B_T	Major axis diameter (arcmin)
190	8^o8	dE4	18.0:	0.'7
381*	6^o18	ImV	16.5:	1.1
585	11^o11	ImV	17.0:	1.4
615	12^o29	dE,N	17.5:	0.7
811		dE or ImV	16.5:	1.3:
869	9^o26	ImV or dE0	15.0:	0.9
884*		dE:	18.5:	0.5:
925		dE	19.5:	0.5:
987		dE:	18.5:	0.4:
1017*	9^o34	ImV	14.5:	2.7
1027	13^o63	dE0,N:	18.08	0.6
1052*		dE	16.0:	1.1:
1149	13^o70	dE3	17.47:	0.8
1181		dE	20.0	0.3
1212	11^o29	dE0,N	16.5:	0.9
1217	IC 3418 = DDO 130	SBmIV	14.0:	2.3
1287*	14^o46	ImV	16.0:	1.1:
1337	15^o50	dE0:	18.0:	0.8
1371	14^o49	dE:	18.2	0.5:
1438	12^o73	dE2:	17.7:	1.0:
1448*	IC 3475 = 13^o82	ImIV or $dE1_p$	13.93	2.9
1551		dE	18.5:	0 4:
1625	11^o43	dE:	18.3:	0.7
1663	12^o82	dE2	17.5	0.8
1702	14^o60	dE4:	17.7	0.8
1776	10^o57	dE or ImIV	17.0:	1.1
1798		dE	18.5:	0.5:
1857*	IC 3647 = 10^o60	dE4:,N?	14.33	2.1
1884	9^o60	dE or ImV	16.0:	1.7:
1904		dE,N	19.0:	0.4
2008*	IC 3720 = 12^o102	dE5	15.0:	1.9

* Illustrated in Paper III
— The most extreme cases are underlined

just happen to occupy the extreme end of the wide, continuous distribution of dwarf galaxies in size and surface brightness.

The catalog is available on magnetic tape in card image format. Anyone interested should send a blank 600-ft tape to: Bruno Binggeli, Astronomical Institute of the University of Basel, Venusstrasse 7, CH-4102 Binningen, Switzerland. The written tape will be returned together with a detailed description.

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