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A CATALOGUE OF DWARF GALAXIES

BY

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By Sidney van den Bergh

Abstract

A catalogue of dwarf galaxies north of $\delta = -23°$ has been compiled from the Palomar Sky Survey prints. The data indicate that the distribution of dwarf galaxies over the sky is non-uniform. A strong concentration of dwarf irregular galaxies is found in the vicinity of M 94 in Canes Venatici.

Introduction

Of the 22 known probable members of the local group of galaxies, 17 are low luminosity dwarfs. Holmberg (1950) has shown that dwarf galaxies also occur in the M81 and M101 groups. More recently Reaves (1956) has discussed the numerous dwarf galaxies which occur in the Virgo Cluster.

Dwarf Criteria

Inspection of the Palomar Sky Survey prints of clusters of galaxies shows that a class of faint objects can be isolated by the following criteria:

A, Low surface brightness.

B, Little or no central concentration of light on the red prints.

In view of the fact, that these objects are found to be more frequent in clusters than in the general field, it is reasonable to assume that they are dwarf galaxies. This conclusion is supported by the similarity which many of these objects have to dwarf galaxies in the local group. Almost all objects which satisfy criteria *A* and *B* are probable dwarf galaxies. However, many galaxies which are known or probable dwarfs do not satisfy *both* criteria.

Types of Dwarf Galaxies

The following types of dwarf galaxies may be distinguished:

Dwarf Irregulars (*DIr*)

Almost all dwarf irregular galaxies were found to be similar to one of the following prototypes in the local group, NGC 6822, IC 1613 and the Wolf-Lundmark system.

Dwarf Spirals (*DSp*)

Two distinct types of dwarf spirals exist. The most easily recognizable type consists of a short bright bar superimposed on a background of low surface brightness. This type is probably a dwarf edition of the normal barred spiral, from which it can be distinguished by the fact that no spiral arms emanate from the tips of the bar.

The second type of dwarf spiral is similar to the IC 1613 type of irregular galaxy. However the resolved images of stars and nebulosity are not distributed at random but lie in elongated patches resembling segments of a spiral arm.

No dwarf spirals are known in the local group.

Dwarf Ellipticals (*DEl*)

The surface brightness and central concentration criteria have not proved to be successful in distinguishing between giant and dwarf ellipticals on the Palomar *prints*. As a result the catalogue contains very few dwarf ellipticals.

Dwarf Spheroidal Galaxies (*DSph*)

The Draco System is the prototype of this kind of galaxy. These objects, which have a very low surface brightness, are rather easy to identify at large distances. Their identification becomes more difficult when they are relatively near by and completely resolved into stars. In this case their appearance on the Sky Survey prints is quite similar to that of a distant cluster of galaxies.

IC 3475 in the Virgo Cluster is the brightest known member of this class.

The Catalogue

The catalogue was compiled from the Palomar Sky Survey prints. It contains all dwarf galaxies with diameters larger than one minute of arc north of $\delta = -23°00'$, which satisfy criteria *A* and *B*. It is hoped that the catalogue will prove useful as a finding list for future investigations. Only a few of the galaxies in the catalogue are contained in the NGC, the IC and Holmberg's list of dwarf galaxies. Twelve of the dwarf galaxies in the catalogue are known members or possible members of the local group.

The first three columns of Table I are self-explanatory. The fourth column (ϕ) contains the maximum diameter of the galaxy on the blue print in millimetres (1 mm. = 67 sec. of arc). The fifth column gives the classification type of the galaxy. The sixth column gives the surface brightness (S) on the blue print on a scale (− −, very low) to (+ +, relatively high). The seventh and eighth columns give the degree of resolution on the red (R) and blue (B) prints respectively on the following scale: −, unresolved; ±, incipient resolution; +, clearly resolved; and + +, resolved stars only.

The ninth column (C) gives an estimate of the colour of the object on a scale (0.0, very blue) to (1.0, very red). For $C = 0.6$ the brightness on the red and blue prints is equal. An N in the last column refers to a note at the end of the table.

The Colours of Dwarf Spirals

The individual colours, estimated on the scale $C = 0.0$ (very blue) to $C = 1.0$ (very red), are quite uncertain. However the mean colours for different types of galaxies are probably significant and are tabulated here. In deriving the mean colours dwarf galaxies near the galactic equator were excluded.

Mean Colours of Dwarf Galaxies

Type	C	n_{obs}
DIr	0.24	100
DSp	0.30	49
DSph	0.50	12
DEl	0.48	5

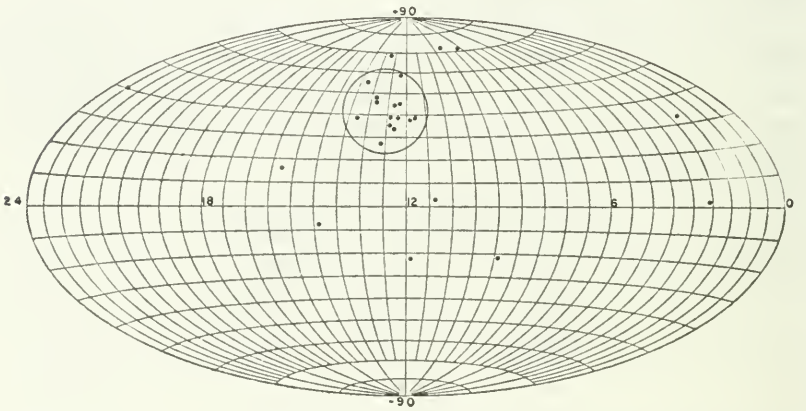
The Distribution of Dwarf Galaxies

The dwarf galaxies of Table I occur almost exclusively outside the 'zone of avoidance' at low galactic latitude. However even at high galactic latitude their distribution is distinctly non-random. In general the distribution of dwarf galaxies over the sky is similar to that of the brightest giant galaxies. However some small clusters of dwarf galaxies occur which are not associated with giant galaxies. The distribution of dwarf irregular galaxies, with diameters larger than two minutes of arc is shown in the figure. The mean distance of these dwarfs is probably smaller than that of the dwarf galaxies

with a diameter less than two minutes of arc. More than half of these objects (excluding members of the local group) are located within 20° of M 94 (NGC 4736). This region also contains a large number of smaller dwarf irregular galaxies and dwarf spirals. In this connection it is of interest to note that the M 94 region is particularly rich in late type giant spirals and giant irregular galaxies.

A somewhat less conspicuous concentration of dwarf galaxies, occurs in the vicinity of M 81. This group contains a mixed population of *DIr*, *DSp*, and *DSph* galaxies.

The very pronounced clustering of dwarf galaxies in the Virgo cluster (Reaves 1956) does not show up well in our data. The reason for this is that almost all the dwarfs in the distant Virgo Cluster have diameters smaller than one minute of arc.



The positions are shown of dwarf irregular galaxies with diameters larger than two minutes of arc. (Probable members of the local group are not shown.) The circle indicates the position of the M 94 group.

References

Holmberg, E. 1950, *Lund Medd*, ser. II, no. 128.
Morgan, W. W. 1958, *Publ. A.S.P.*, vol. 70, p. 364.
Reaves, G. 1956, *A. J.*, vol. 61, p. 69.

Note added in proof: Most of the spiral and irregular galaxies listed in the catalogue are of luminosity classes IV–V and V on the D.D.O. system. However, a few objects of luminosity class IV are included.

Richmond Hill, Ontario
January 15, 1959

TABLE I

CATALOGUE OF DWARF GALAXIES

No.	α(1855)	δ(1855)	ϕ	Type	S	Resolution R	B	C	Notes
1	$0^h\ 11^m$	−19°50′	1.0	DSp?	±	±	±	0.2	
2	12	+10 05	1.0	DSp	+	±	+	0.2	N
3	25	+47 40	6.0	DEl	+	−	−	0.8	N
4	26	+30 40	1.0	DSp	±	−	±	0.2	
5	39	−12 20	1.5	DIr	±	−	±	0.2	
6	43	−21 50	1.0	DIr/DSp	±	−	±	0.0	N
7	54	+06 50	1.0	DIr	+	−	±	0.0	
8	57	+01 20	15.0	DIr	+	+	+	0.2	N
9	1 02	+48 50	1.5	DIr	±	−	±	0.4	N
10	14	+11 40	1.5	DIr/D?Sp	+	−	±	0.2	
11	22	+25 05	1.5	DSp	+	−	+	0.2	N
12	27	+03 40	1.5	D	±	−	−	0.2	
13	32	+15 10	1.5	DSph/DIr	−	−	−	0.2	N
14	41	−13 10	1.5	DSp	±	±	+	0.0	
15	42	−13 30	1.0	DEl	−	−	−	0.6	
16	44	+17 25	1.5	DSp	±	−	−	0.2	N
17	55	+21 15	1.5	DSp	±	−	+	0.0	
18	2 03	+06 05	1.0	D?	±	−	?	0.4	
19	16	+35 20	1.5	DIr	±	−	±	0.6	
20	19	−10 30	2.0	D?Sp	+	±	+	0.4	N
21	19	−22 05	1.5	DIr/DSph	±	−	−	0.4	N
22	24	+38 00	1.0	DIr	±	−	−	0.2	N
23	24	−11 25	1.0	DSp	±	−	±	0.4	N
24	25	+39 50	1.5	DIr/DSp	±	−	±	0.8	N
25	25	+32 50	2.0	DIr	±	±	+	0.2	N
26	26	+29 05	1.0	DIr	+	−	−	0.0	
27	33	+00 40	1.0	DIr	−	−	−	0.0	N
28	40	+03 15	3.0	DIr?	−	−	−	0.6	
29	42	+01 30	3.0	DIr	−	−	±	0.4	N
30	44	−01 45	1.5	DSp	±	−	±	0.2	N
31	3 07	−03 20	1.5	DIr/DSp	+	+	+	0.2	N
32	07	−05 20	1.0	DIr/DSp	±	±	+	0.4	
33	4 29	+74 40	1.0	DSp	±	−	±	0.4	
34	41	00 00	1.0	D?Ir	±	−	−	0.4	N
35	55	+16 10	1.0	DIr	±	±	±	0.8	N
36	5 01	−16 30	1.0	D?Sp	±	−	±	0.4	
37	13	−21 45	1.5	DIr?	−	±	±	0.6	N
38	16	+73 35	1.0	DIr	−	−	±	0.2	
39	36	+75 15	2.0	DSph	−	−	−	0.4	
40	6 53	+56 40	1.0	DIr	+	−	±	0.4	N
41	58	+53 40	1.0	DIr	±	−	±	0.4	
42	7 13	+69 30	5.0	D?Ir?	+	+	+	0.2	N
43	18	+41 05	1.0	DIr	+	−	±	0.2	
44	20	+67 10	1.5	DSph	− −	−	−	0.4	N
45	28	+03 05	2.0	DIr?	±	−	−	1.0	N
46	31	+40 25	1.0	DSph?	±	−	−	0.4	
47	34	+17 05	3.0	DIr?	±	−	−	0.4	N
48	47	+58 25	1.5	DSp?	±	−	−	0.2	
49	8 01	+46 55	1.0	DSp	±	−	−	0.2	
50	04	+71 10	6.5	DIr	+	+	+	0.2	N
51	08	+74 55	1.0	DSp	±	±	±	0.4	N
52	19	+42 20	1.0	DEl	±	−	−	0.4	
53	21	+66 40	1.0	DIr	±	±	+	0.2	

TABLE I

CATALOGUE OF DWARF GALAXIES (*cont.*)

No.	α(1855)	δ(1855)	ϕ	Type	S	Resolution R	Resolution B	C	Notes
54	9h 00m	+06°30′	1.5	DIr/DSph	+	−	−	0.6	
55	03	+36 05	1.0	DIr	±	−	±	0.2	
56	03	−22 25	1.0	DSph?	−	−	−	0.8	
57	04	−14 25	1.0	DIr	±	−	±	0.2	N
58	05	+20 00	1.0	DIr	±	−	+	0.4	
59	06	+39 50	1.0	DSp	±	±	±	0.4	
60	13	−11 35	1.0	DIr	±	±	+	0.4	
61	14	−12 00	1.0	DIr	±	−	−	0.6	
62	15	−21 50	2.0	DIr	±	−	−	0.4	N
63	28	+71 50	2.5	DIr	−	±	±	0.2	N
64	42	+32 10	1.5	DIr	+	−	±	0.2	
65	44	+02 05	1.0	DIr	−	−	±	0.2	N
66	46	+69 45	1.5	DIr	±	−	±	0.2	N
67	48	+81 00	1.5	DSp	+	±	+	0.4	N
68	48	+29 30	2.0	DSp	±	−	−	0.0	N
69	51	+31 25	3.5	DIr	±	+	+	0.0	N
70	52	+06 00	3.0	DIr	+	±	+	0.2	N
71	55	+67 15	1.0	DSph	− −	−	−	0.6	
72	10 00	+30 15	1.0	DEl	±	−	−	0.4	
73	01	+30 50	1.0	DIr	±	−	±	0.2	
74	01	+13 00	8.5	DEl	+	+	+	0.4	N
75	04	−04 00	4.0	DIr	±	+	+	0.0	N
76	04	−13 05	1.5	DIr	±	−	±	0.2	
77	13	+71 40	2.0	DSp	+	±	+	0.6	
78	16	+68 20	1.0	DSph	− −	−	−	0.6	
79	17	+15 30	1.0	DSp	+	−	±	0.4	
80	19	+70 45	2.0	DSp	±	±	+	0.4	
81	19	+69 10	11.5	D?Ir?	+	+	+	0.2	N
82	20	+71 20	1.5	DIr?	±	±	±	0.6	
83	28	+32 15	1.0	DIr	+	−	±	0.2	
84	34	+35 15	4.0	D?Sp	±	±	+	0.4	N
85	34	−22 40	1.0	DIr	±	−	−	0.4	
86	35	+61 05	1.5	DIr	±	−	±	0.2	
87	40	+66 15	1.0	DSph	− −	−	−	0.4	
88	40	+14 50	1.0	DIr	+	−	±	0.4	N
89	43	+20 25	1.0	DIr	+	−	±	0.2	N
90	45	+08 25	1.0	DIr	−	−	±	0.4	
91	58	+20 35	1.0	DIr	±	−	−	0.4	
92	11 05	+54 20	1.0	DIr/DSp	+	−	±	0.2	
93	06	+22 55	5.0	DSph	− −	+ +	±	0.4	N
94	13	+03 20	2.0	DIr	+	±	+	0.2	
95	17	+04 10	1.5	D?Sp	+ +	+	+	0.2	N
96	36	+59 55	1.0	DSp	±	−	±	0.6	
97	42	+24 40	1.0	DIr	±	−	−	0.4	
98	43	+57 15	1.0	DSp	+	±	+	0.4	
99	44	+39 25	3.5	DIr	+	−	±	0.2	
100	45	+52 55	1.0	DSp	±	−	−	0.2	N
101	48	+32 20	1.0	DIr	±	−	−	0.4	
102	50	+51 40	1.0	DSp	−	−	−	0.4	N
103	51	−13 45	1.0	DSp	+	+	+	0.2	
104	51	−13 55	1.0	DIr	±	−	±	0.4	
105	51	+38 50	2.5	DIr	−	−	±	0.2	
106	51	−21 40	2.0	DIr	−	−	−	0.6	

TABLE I

CATALOGUE OF DWARF GALAXIES (*cont.*)

No.	α(1855)	δ(1855)	ϕ	Type	S	Resolution R	Resolution B	C	Notes
107	$11^h\ 52^m$	+38°40′	1.5	DSp	+	±	±	0.4	N
108	57	−00 44	1.0	DIr	±	−	±	0.2	
109	12 00	+40 35	1.0	DIr	−−	−	−	0.2	N
110	04	+02 50	1.0	DSph	−	−	−	0.4	
111	04	+51 05	1.0	DIr	−	−	−	0.4	N
112	04	+18 50	1.0	DIr?	++	−	±	0.2	N
113	07	+37 00	1.0	DSph	−−	−	−	0.4	N
114	07	+13 35	1.0	DSp	±	−	±	0.2	
115	08	+14 20	1.0	DIr	±	−	−	0.2	
116	09	−10 40	1.5	DIr	±	±	±	0.4	N
117	10	+29 35	1.0	DIr	±	−	±	0.2	
118	10	−10 50	1.0	DIr	−	±	±	0.4	
119	13	+47 10	1.5	DSp	+	±	+	0.4	N
120	14	+46 40	1.0	DIr	±	±	+	0.0	
121	15	+01 15	1.0	DIr	±	−	+	0.0	
122	19	+71 10	1.5	DSp/DIr	+	−	±	0.4	
123	19	+59 05	2.0	DIr	±	−	+	0.0	
124	20	+13 55	1.0	DSp	+	−	−	0.0	
125	20	+44 15	3.0	DIr	+	±	±	0.0	N
126	20	+38 00	2.0	DIr	+	−	±	0.0	N
127	21	+38 00	1.0	DIr?	±	−	−	0.2	N
128	22	+03 35	1.5	DIr	±	−	±	0.2	
129	22	+44 00	2.0	DIr	±	±	+	0.0	N
130	22	+12 15	1.0	DIr	−	−	−	0.4	N
131	24	+30 30	1.0	DIr	±	−	±	0.2	
132	25	+13 35	1.0	DSph	±	−	−	0.6	N
133	26	+32 25	3.0	DIr	±	−	±	0.2	
134	26	−01 50	1.0	DIr	±	−	±	0.2	
135	27	+16 00	1.5	DSp	+	±	+	0.4	N
136	28	+16 00	1.0	DIr	±	−	±	0.4	N
137	28	+07 05	1.0	DSph	±	−	−	0.4	
138	29	+07 25	1.0	DIr	±	−	+	0.4	N
139	30	+07 55	1.0	DIr	±	−	+	0.4	
140	32	+08 45	1.0	DSp	++	+	+	0.2	N
141	35	+39 15	2.0	DIr	+	−	±	0.2	N
142	37	−04 55	2.0	DSp	±	±	±	0.6	
143	37	+35 10	2.0	DIr	−	−	±	0.2	
144	37	+01 15	1.0	DSp	+	±	±	0.4	
145	38	+12 50	1.0	DEl	±	−	−	0.6	N
146	38	−05 20	2.5	DIr/DSp	±	−	±	0.4	
147	40	+37 15	1.0	DIr?	−	−	−	0.2	
148	41	−04 30	1.5	DSph	−	−	−	0.6	
149	42	−03 15	1.0	DIr/DSp	+	−	±	0.2	
150	42	+51 55	1.5	DIr	±	±	+	0.4	N
151	43	−10 05	3.5	D?Sp	±	±	+	0.4	
152	45	−05 30	1.0	DIr	±	−	±	0.2	
153	46	−11 20	1.5	DIr	±	−	±	0.2	
154	47	+27 55	3.0	DIr	+	−	+	0.0	
155	49	+15 00	1.0	DIr	+	+	+	0.0	
156	50	+03 30	1.0	DIr	±	±	±	0.4	
157	51	+15 40	1.0	DEl?	±	−	−	0.4	
158	51	+03 35	1.0	DSp	±	±	±	0.6	
159	53	−14 55	1.5	DSph	−−	−	−	0.8	

TABLE I

CATALOGUE OF DWARF GALAXIES (*cont.*)

No.	α(1855)	δ(1855)	ϕ	Type	Resolution S	R	B	C	Notes
160	12h 54m	−03°55′	1.0	DSp	+	±	±	0.0	
161	55	−16 40	6.5	D?	±	+	+	0.4	N
162	58	−07 25	1.0	DSp	+	±	+	0.4	N
163	58	−07 10	1.0	DSp	±	−	±	0.4	N
164	59	−16 45	1.0	DIr?	−	−	±	0.4	
165	13 01	+68 30	2.5	DIr	+	−	±	0.2	
166	06	+37 05	1.5	DIr	+	−	+	0.2	N
167	07	+47 05	1.0	DIr	±	±	+	0.2	
168	08	+46 40	3.0	DIr	+	+	+	0.0	
169	09	+48 15	3.0	DIr	±	±	±	0.0	
170	09	+26 10	1.0	DIr?	+	−	−	0.2	N
171	11	−07 40	1.0	DIr	+	−	+	0.2	
172	12	+42 45	1.5	DSp	+	−	±	0.6	N
173	14	+10 30	1.5	D?Sp	+	−	±	0.2	
174	19	−21 30	1.0	DIr	±	±	±	0.2	
175	20	+58 35	1.5	DIr	±	−	±	0.4	N
176	24	+46 05	1.5	DSp	+	−	±	0.2	
177	30	+46 55	1.0	DSp	±	−	+	0.4	
178	30	+46 40	1.0	DSp	±	−	±	0.4	
179	30	+08 25	2.0	D?Ir	+	−	±	0.4	
180	31	−09 05	1.0	D?Sp	+	±	+	0.4	
181	34	+41 25	1.5	DIr	+	−	±	0.4	
182	36	+40 20	1.0	DIr	±	−	−	0.2	
183	45	+38 45	2.0	DIr	+	−	−	0.2	N
184	48	+18 30	2.0	DSp?	±	−	−	0.2	N
185	49	+54 35	2.5	DIr	+	−	+	0.0	N
186	14 00	+55 10	1.0	DIr	+	±	+	0.0	N
187	09	+23 40	1.0	DIr	+	−	±	0.0	
188	09	+17 15	1.0	DSp	±	−	±	0.4	
189	17	+46 05	1.0	DIr	±	−	±	0.2	
190	19	+45 10	1.0	DIr	+	−	±	0.2	
191	20	+56 55	1.5	DSp	±	±	±	0.6	
192	24	+45 05	1.0	DSp	±	−	±	0.2	
193	30	+59 10	1.0	DSp	+	±	+	0.2	
194	31	+57 50	1.0	DIr	±	−	−	0.4	
195	31	−08 00	2.0	DIr	−	−	±	0.0	
196	38	+08 30	1.0	DIr	−	−	−	0.4	
197	42	−09 30	2.0	D?Sp	+	±	+	0.2	N
198	57	+53 15	1.0	DIr	+	±	±	0.2	
199	15 07	+67 50	20.0	DSph	−−	++	++	?	N
200	32	+44 40	1.0	DSp	±	±	±	0.2	
201	35	+00 55	1.0	DIr?	+	−	±	0.4	N
202	45	+16 45	2.0	DIr	−	−	±	0.0	
203	55	+82 15	1.0	DSp	+	−	±	0.4	
204	16 12	+47 25	1.5	DSp	+	±	+	0.2	
205	16	+64 15	1.0	DSp	±	−	±	0.2	N
206	51	+53 20	1.0	DSp	−	±	±	0.2	N
207	17 13	+14 35	1.0	DSp	±	−	−	0.2	
208	18	+58 05	8.0	DSph	−−	++	++	?	N
209	19 37	−15 10	12.5	DIr	+	+	+	0.2	N
210	20 39	−13 25	1.5	DEl/DIr	−−	−	±	0.0	N
211	22 02	−19 35	1.0	DEl?	±	−	−	0.8	
212	09	−21 55	1.5	DSp	++	+	+	0.0	

TABLE I

CATALOGUE OF DWARF GALAXIES (*concluded*)

No.	α(1855)	δ(1855)	ϕ	Type	Resolution S	R	B	C	Notes
213	$22^h\ 27^m$	+32°05′	1.5	DIr	±	−	±	0.2	N
214	29	−03 40	2.0	D?Ir	+	±	+	0.0	
215	32	−05 30	1.0	DIr	−	−	±	0.0	
216	23 21	+13 55	4.0	DIr/DEl	±	±	±	0.4	N
217	23	+40 10	2.5	DIr	±	−	±	0.2	N
218	28	+17 25	1.0	DIr/DSp	+	±	±	0.4	N
219	30	−00 30	1.5	D?Ir	+	−	±	0.4	N
220	42	+25 25	1.0	DIr	+	−	±	0.2	
221	54	−16 15	11.0	DIr	+	+	+	0.2	N
222	56	+14 30	1.5	DIr	±	−	±	0.2	

NOTES

2. Has two very faint companions.
3. NGC 147; member of local group.
6. Member of NGC 247, NGC 253 group.
8. IC 1613; member of local group.
9. Obscured.
11. Good example of dwarf barred spiral.
13. Near M 74.
16. Largest of a small cluster of dwarfs.
20. In NGC 945 group.
21. Near NGC 908.
22. Elongated.
23. In NGC 945 group.
24. Obscured.
25. Near NGC 925.
27. In a cluster.
29. In a cluster.
30. In a cluster.
31. Near NGC 1253.
34. Obscured.
35. Obscured.
37. Star projected on nucleus.
40. Has *DSp* companion.
42. NGC 2366.
44. Near NGC 2403.
45. Obscured. Emission nebula?
47. Galactic nebula?
50. Ho II.
51. Has dwarf companion.
57. Near NGC 2781.
62. Near NGC 2835. Very elongated.
63. Ho I.
65. Near NGC 3044.
66. Near M 81; M 81 also has another dwarf companion.
67. NGC 3057.
68. Companion to Leo A?
69. Leo A = Leo III; possible member of local group.
70. Sextans B; possible member of local group.
74. Regulus system = Leo I; probable member of local group.

75. Sextans A; possible member of local group.
81. IC 2574.
84. May be low density spiral like NGC 4236.
88. In a cluster.
89. Elongated.
93. Leo B = Leo II; probable member of local group.
95. NGC 3664. Reproduction of this dwarf (?) barred spiral in Morgan (1958).
100. Near NGC 3953.
102. Near NGC 4026.
107. NGC 4025.
109. Near NGC 4145.
111. Near NGC 4157.
112. Elongated.
113. Near NGC 4214.
116. Very elongated.
119. NGC 4288.
125. Near NGC 4449.
126. Blue nucleus.
127. Blue nucleus.
129. Near NGC 4449.
130. IC 3418?
132. IC 3475.
135. NGC 4523.
136. IC 3522.
138. IC 3576.
140. IC 3617.
141. IC 3687.
145. IC 3720.
150. NGC 4707. Star projected on nucleus.
161. Very elongated, multiple nuclei. Has three dwarf companions.
162. Near NGC 4958.
163. Near NGC 4958.
166. Ho VIII; near NGC 5033.
170. Elongated.
172. Near M 63.
175. Near NGC 5204.
183. Elongated.
184. Nucleus very blue.
185. Ho IV.
186. NGC 5477; companion of M 101.
197. Colliding giant spirals?
199. Ursa Minor system; probable member of local group. This system was overlooked during the search for dwarf galaxies; it has however been included in the catalogue for the sake of completeness.
201. Very elongated.
205. Has dwarf companions.
206. Has distant *DIr* companion.
208. Draco system; member of local group.
209. NGC 6822; member of the local group. Obscured.
211. Has dwarf companion.
213. Blue nucleus.
216. Pegasus system; possible member of local group.
217. Obscured.
218. Brightest member of a small cluster of dwarf galaxies.
219. Near NGC 7716.
221. Wolf-Lundmark system; possible member of local group.