Appendix: Swift's Deep Sky Catalogs

G.W. Kronk, *Lewis Swift*, Historical & Cultural Astronomy,
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Catalog 1 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S1–1	1884 Aug 3	0	4	32	+28	21	5	vvF; vS; E; B * nr	0	10	32.8	+28	59	46	NGC 27	L. Swift	GX	13.5	1.2′ × 0.5′	PGC 742
S1–2	1884 Oct 9	2	2	35	+7	25	0	vF; pS; vvE; spindle; cannot be G. C. 493 [NGC 827], is not “am st”, nearest * is 5′ distant. Did not see [GC] 493 [NGC 827], but saw [GC] 5223 [NGC 840]. H. description must apply to some other nebula.	2	8	56.3	+7	58	17	NGC 827	W. Herschel (1784)	GX	12.7	2.2′ × 0.8′	PGC 8196*
S1–3	1884 Nov 9	2	27	22	+9	13	46	vF; cE.	2	33	22.7	+9	36	6	NGC 975	L. Swift	GX	13.1	1.1′ × 0.8′	PGC 9735*
S1–4	1884 Nov 9	2	45	2	−2	13	6	F; vE.	2	50	39.2	−1	44	3	NGC 1121	L. Swift	GX	12.9	0.9′ × 0.4′	PGC 10789
S1–5	1884 Oct 18	3	1	31	+40	27	0	S; R; vvF. Right angled with 2 st. In field with Algol.	3	9	42.2	+40	53	35	NGC 1212 = IC 1883	L. Swift	GX	14.4	0.9′ × 0.5′	PGC 11815*

S1–6	1884 Oct 14	3	1	32	+38	11	20	vvF; lE; v diff; F * close n.	3	9	17.3	+38	38	58	NGC 1213 = IC 1881	L. Swift	GX	14.5	1.8′ × 1.4′	PGC 11789
S1–7	1883 Nov 24	6	26	36	+10	23	15	Nebulous *; v diff; B * exactly in center of L eF nebulosity; f. [GC] 1425 [NGC 2245] 28 s and is 10′′ n. Resembles [GC] 4634 [NGC 7023] in Cepheus, but is fainter.	6	33	4.4	+10	19	21	NGC 2247	L. Swift	RN		4′ × 3′	LBN 901
S1–8	1885 May 11	9	23	20	+68	7	45	pF; pS; R; lbM.	9	32	52.9	+67	37	3	NGC 2892	L. Swift	GX	13.1	1.4′ × 1.4′	PGC 27111
S1–9	1883 Aug 24	10	49	5	+18	13	30	pB; R; no * nr.	10	54	48.6	+17	37	16	NGC 3460 = NGC 3457	F. Bailey (1827)	GX	12.6	0.9′ × 0.9′	PGC 32787
S1–10	1883 Aug 24	11	4	25	+22	21	30	eeF; vS; R; diff; s of 2.	11	9	44.4	+21	45	32	NGC 3551	L. Swift	GX	13.7	1.4′ × 1.2′	PGC 33836
S1–11	1883 Aug 24	11	4	35	+22	22	0	vF; R; n of 2.	11	9	50.3	+21	48	37	NGC 3555	L. Swift	GX	14.6	0.4′ × 0.2′	PGC 33843
S1–12	1883 Apr 26	11	8	4	+21	1	0	cS; vF; f [Delta] Leonis 4 s. Easily overlooked.	11	14	2.5	+20	23	14	NGC 3588	L. Swift	GX	14.3	0.6′× 0.6′	PGC 34219

(continued)

Catalog 1 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S1–13	1885 Apr 13	11	38	40	+20	8	42	vF; vS; R; B * 12 s f; np of 2.	11	44	50.1	+19	31	58	NGC 3857	E. Stephan (1884)	GX	14.1	1.0′ × 0.6′	PGC 36548*
S1–14	1885 Apr 13	11	38	45	+20	3	42	eeF; R; pS; B * nf; sf of 2.	11	44	52.3	+19	27	15	NGC 3859	E. Stephan (1884)	GX	14.1	1.2′ × 0.3′	PGC 36582*
S1–15	1885 Apr 13	11	39	10	+20	0	27	vF; S; lE; 8 mag * in field.	11	45	15.7	+19	23	32	NGC 3864	E. Stephan (1884)	GX	14.1	0.9′ × 0.7′	PGC 36620*
S1–16	1885 Apr 13	11	39	10	+20	12	37	vF; pS; R.	11	45	5.0	+19	36	23	NGC 3862	W. Herschel (1785)	GX	12.7	1.5′ × 1.5′	PGC 36606
S1–17	1885 Apr 10	11	43	45	+12	42	43	F; vS; R; mbM.	11	49	52.7	+12	11	9	NGC 3908	L. Swift	GX	15.0	0.6′ × 0.5′	PGC 36967*
S1–18	1885 Apr 16	11	50	15	+56	1	40	eF; pL; pE; v diff; D neb nr.	11	56	7.1	+55	23	26	NGC 3980 = NGC 3977	W. Herschel (1789)	GX	13.4	1.7′ × 1.5′	PGC 37497
S1–19	1885 Apr 6	11	54	40	+20	2	35	pF; pL; R; n. of 2 st. which form with it a right angle triangle.	12	0	34	+19	24	10	comet?					Comet*

S1–20	1884 Jun 18	11	59	1	+65	5	40	S; F; vE; D * nr; p, nearest B * east 20s.	12	4	33.9	+64	26	12	NGC 4081	L. Swift	GX	12.8	1.5′ × 0.6′	PGC 38212
S1–21	1885 Apr 6	12	5	0	+19	39	35	vvF; vS.	12	10	45.7	+19	2	27	NGC 4155	L. Swift	GX	13.3	1.1′ × 1.0′	PGC 38761
S1–22	1884 Mar 16	12	28	32	+51	26	54	eeF; S; R; nearly bet. 2 st.	12	33	56.0	+50	49	6	NGC 4537 = NGC 4542	J. Herschel (1831)	GX	13.9	1.0′ × 0.5′	PGC 41864*
S1–23	1885 Jun 14	13	13	45	+40	12	20	pF; R; pL; DM. +40°2644.5 point to it.	13	19	3.1	+39	35	26	NGC 5083	L. Swift	GX	14.2	1.3′ × 1.1′	PGC 46413
S1–24	1885 Apr 6	13	34	30	−23	18	9	eF; pL; p by 6 s the middle * in a line n. and s.	13	40	19.9	−23	51	29	NGC 5260	L. Swift	GX	12.9	1.6′ × 1.4′	PGC 48371
S1–25	1885 Apr 10	13	43	10	−29	58	56	vvF; pS; lE; v F * f; p diff.	13	50	1.5	−30	34	43	NGC 5304	L. Swift	GX	12.6	1.5′ × 1.0′	PGC 49090
S1–26	1884 Jun 16	13	53	3	+46	53	9	F; vS; to nu. * v close.	13	57	38	+46	19	30	NGC 5391	L. Swift				Missing
S1–27	1884 Jun 16	13	57	0	+49	0	28	vvF; S; lE; B * 4′ n; 2 coarse D * in field.	14	0	47.7	+48	26	38	NGC 5425	L. Swift	GX	13.6	1.9′ × 0.5′	PGC 49889

(continued)

Catalog 1 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S1–28	1883 Jul 9	13	57	38	+46	52	26	vF; pL; cE; bet. 2 st. forming with 2 others a trap., the nf. being a fine D * of 2.5″. First neb. discovered at this Observatory. I have not been able to see this object well since its discovery, at which time I called it pB with p sharp outlines, but since the appearance of the red sunsets it has been ill defined and difficult to see except as a hazy spot. This remark applies to all vF nebulae. The D * is new.	14	1	57.7	+46	18	43	NGC 5439	L. Swift	GX	13.9	1.0′ × 0.3′	PGC 49965

S1–29	1885 May 9	14	6	5	+60	59	15	eeeF; pS; R; ee diff.; bet. 2 st one a wide double. Edward.	14	9	34.0	+60	24	35	NGC 5502 = NGC 5503	E. Swift	GX	15.0	0.3′ × 0.1′	PGC 50508*
S1–30	1885 May 11	14	6	12	+60	56	45	eeeF; vS; R; ee dif.; forms with 2 st. a right angle triangle.	14	9	34.0	+60	24	35	NGC 5503 = NGC 5502	L. Swift	GX	15.0	0.3′ × 0.1′	PGC 50508*
S1–31	1885 May 11	14	13	50	+59	16	50	vvF; pS; R; F * nr. West.	14	17	22.8	+58	45	2	NGC 5561	L. Swift	GX	14.9	0.4′ × 0.4′	PGC 2800986
S1–32	1884 Jun 14	14	14	0	+7	34	4	S; vvF; lE; 2 F st. point to it; 2 others nr.; v diff.; np. Of 2.	14	19	3.9	+7	1	54	NGC 5558 = NGC 5552	A. Marth (1864)	GX	14.2	0.8′ × 0.3′	PGC 51140
S1–33	1884 Jun 14	14	14	31	+7	33	4	S; vvF; sf. of 2; v diff.; a * midway bet. them.	14	19	15.0	+7	1	16	NGC 5564 = NGC 5554	A. Marth (1864)	GX	14.2	0.7′ × 0.5′	PGC 51160
S1–34	1884 Jun 14	14	14	31	+7	32	34	S; vvF; R; v diff.	14	20	13	+7	0	51	NGC 5565	L. Swift				Missing*
S1–35	1884 May 22	14	15	30	+6	44	5	vS; lE; vF; mbM. to nu.	14	20	59.4	+6	12	10	NGC 5578 = NGC 5575	A. Marth (1864)	GX	13.3	0.9′ × 0.9′	PGC 51272
S1–36	1885 Jun 22	14	33	35	+52	3	54	B; pS; R; p. DM. + 52°1816 31 s. Found in presence of a half moon. First found 7 years ago with 4 1/2 inch Comet seeker and recorded as “can find no record of it”.	14	37	30.8	+51	33	43	NGC 5707	L. Swift	GX	12.5	2.6′ × 0.5′	PGC 52266

(continued)

Catalog 1 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S1–37	1885 May 14	14	45	50	+47	51	40	vvF; pS; R; * nr.·; saw another nr. as I supposed, but could not refind it.	14	49	34.4	+47	22	34	NGC 5767	L. Swift	GX	14.1	0.9′ × 0.6′	PGC 52942
S1–38	1885 Jun 9	14	49	0	+56	23	20	vF; pS; lE; 1BM; pB * nr.	14	52	9.5	+55	53	58	NGC 5779	L. Swift	GX	14.7	0.5′ × 0.4′	PGC 53090
S1–39	1885 Jun 9	14	56	30	+55	57	20	vF; E; pL; * nr.; [GC] 4058 [NGC 5866] in field.	15	6	33.8	+55	28	45	NGC 5826 = NGC 5870	L. Swift	GX	13.9	1.2′ × 0.9′	PGC 53949*
S1–40	1885 Jun 11	15	3	0	+56	2	20	eF; pS; R; v diff.; 3 st. in a line point to it; [GC] 4058 nr.	15	6	3.3	+55	34	27	NGC 5862	L. Swift	GX	14.6	0.5′ × 0.5′	PGC 53900
S1–41	1885 Jun 11	15	3	30	+55	55	20	eeF; pS; 1E; vv diff.; p a B * 7 s; [GC] 4058 [NGC 5866] in field.	15	6	33.8	+55	28	45	NGC 5870 = NGC 5826	L. Swift	GX	13.9	1.2′ × 0.9′	PGC 53949*
S1–42	1885 Jun 11	15	4	35	+55	11	45	vF; pL; R; in center of a L equilateral triangle of 3 B st.	15	7	51.8	+54	45	10	NGC 5874	L. Swift	GX	12.4	2.3′ × 1.6′	PGC 54018

S1–43	1885 Jun 11	15	6	10	+54	57	0	F; S; mbM; R.	15	9	31.6	+54	30	23	NGC 5876 = IC 1111	L. Swift	GX	12.7	2.4′ × 1.2′	PGC 54110*
S1–44	1884 Jun 15	15	18	30	+13	8	15	F; vS; forms a right angle triangle with 2 st.	15	23	24.9	+12	42	56	NGC 5926	L. Swift	GX	13.5	0.9′ × 0.9′	PGC 54950
S1–45	1883 Jul 11	15	24	0	+69	8	13	pB; lE; pS.	15	24	46.0	+68	43	50	NGC 5939	L. Swift	GX	13.0	0.9′ × 0.5′	PGC 55022
S1–46	1884 May 21	16	25	0	+20	25	27	eeF; vE; F * at p. end; v diff.	16	31	20.8	+20	11	8	NGC 6168	L. Swift	GX	14.3	1.4′ × 0.3′	PGC 58423*
S1–47	1884 Aug 2	16	39	5	+66	15	51	vF; S; R; coarse D * in field north.	16	39	31.9	+66	2	22	NGC 6214	L. Swift	GX	13.5	1.0′ × 0.8′	PGC 58709
S1–48	1884 Jun 28	16	44	8	+70	50	28	pF; pL; lE. 1st of 4.	16	43	20.2	+70	37	57	NGC 6232	L. Swift	GX	12.5	1.6′ × 1.6′	PGC 58841
S1–49	1884 Jun 28	16	45	9	+70	58	58	F; pL; B * nr. 2nd of 4.	16	44	3	+70	46	33	NGC 6237	L. Swift				Missing
S1–50	1884 Jun 28	16	45	10	+70	50	28	vvF; E; S. 3rd of 4.	16	44	34.7	+70	46	49	NGC 6236	L. Swift	GX	11.9	2.9′ × 1.7′	PGC 58891
S1–51	1884 Jun 28	16	46	30	+71	0	28	vF; pL; R. 4th of 4.	16	45	22	+70	48	16	NGC 6245	L. Swift				Missing
S1–52	1884 Aug 19	16	58	0	+68	37	54	vvF; vS; R; vF * nr.; sp. of 2. Edward.	16	57	24.5	+68	27	26	NGC 6288	E. Swift	GX	14.5	0.8′ × 0.4′	PGC 59312
S1–53	1884 Aug 19	16	58	30	+68	40	0	eF; eE; pL; 2 B st. nr. n; nf. of 2. Edward.	16	57	45.0	+68	30	53	NGC 6289	E. Swift	GX	14.5	0.8′ × 0.6′	PGC 59322
S1–54	1884 Oct 14	17	5	0	+68	30	25	vvF; cE; pL; nearly bet. 2 st.	17	5	2.7	+68	49	39	NGC 6303	L. Swift	GX	13.7	1.3′ × 0.8′	PGC 59573*

(continued)

Catalog 1 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S1–55	1883 Jun 2	17	8	14	+63	2	30	eeF; S; R; F * nr.; sp. of 2.	17	8	59.5	+62	53	52	NGC 6317	L. Swift	GX	15.0	1.2′ × 0.4′	PGC 59708
S1–56	1885 May 14	17	8	20	+63	6	45	vS; vF; R; 1bM; nf. of 2.	17	9	44.0	+62	58	23	NGC 6319	L. Swift	GX	13.5	0.4′ × 0.4′	PGC 59717
S1–57	1885 Apr 19	17	21	20	+57	4	50	vS; vF; R; B * nr. n.	17	23	25.2	+56	58	28	NGC 6370	L. Swift	GX	12.9	1.4′ × 1.4′	PGC 60192
S1–58	1885 Jun 13	17	22	30	+59	6	10	eeeF; pL; vv diff.; forms a right angle triangle with 2 st., p. * in same parallel 30 s distant.	17	24	8.0	+58	59	43	NGC 6373	L. Swift	GX	13.6	1.3′ × 1.0′	PGC 60220
S1–59	1885 Jul 7	17	25	45	+60	6	2	vF; pL; E; DM. +60°1754 much interferes with visibility.	17	27	16.9	+60	0	51	NGC 6381	L. Swift	GX	12.9	1.3′ × 1.0′	PGC 60321
S1–60	1883 Jun 2	17	25	59	+56	57	20	pF; pS; R; * near. Edward.	17	27	55.2	+56	52	8	NGC 6382	E. Swift	GX	14.0	0.9′ × 0.9′	PGC 60342*
S1–61	1883 Jun 8	17	26	29	+52	48	20	vF; pS; R; bet. 2 st.	17	28	51.8	+52	43	25	NGC 6386	L. Swift	GX	13.8	1.0′ × 1.0′	PGC 60367
S1–62	1885 Jul 7	17	26	50	+60	17	5	eeeF; cE; ee diff.; one of my minima visible.	17	28	28.0	+60	5	40	NGC 6390	L. Swift	GX	13.8	1.6′ × 0.3′	PGC 60356*

S1–63	1884 Sep 18	17	28	30	+71	10	43	vF; pL; lE; D * n; 2 st. nr. point to it. Edward.	17	26	31.3	+71	5	47	NGC 6395	E. Swift	GX	12.3	2.4′ × 0.7′	PGC 60291
S1–64	1885 Jul 7	17	28	45	+59	43	32	vvF; pS; R; 2 B st. nr. n; s of 2.	17	30	8.5	+59	31	55	NGC 6393	L. Swift	GX	15.7	0.4′ × 0.4′	PGC 60405
S1–65	1885 Jul 7	17	28	45	+59	47	3	vvF; pS; R; 2 st. point to it, the nearer is D; the other and the neb. are equally distant from D *; n of 2.	17	30	21.4	+59	38	24	NGC 6394	L. Swift	GX	14.5	1.3′ × 0.4′	PGC 60410*
S1–66	1885 Jul 7	17	30	10	+59	41	17	vvF; vS; R.	17	31	50.3	+59	36	56	NGC 6399	L. Swift	GX	13.7	1.1′ × 0.6′	PGC 60442
S1–67	1885 Jun 18	17	33	20	+50	50	8	vF; S; R.	17	36	35.4	+50	45	57	NGC 6409	L. Swift	GX	13.8	0.8′ × 0.6′	PGC 60565
S1–68	1885 May 4	17	36	38	+58	47	45	eF; pS; R; forms a right angle triangle with 2 st., one m b. Edward.	17	38	9.3	+58	42	54	NGC 6418	E. Swift	GX	14.4	0.5′ × 0.4′	PGC 60610
S1–69	1885 Apr 19	17	41	50	+56	51	20	vF; pS; R; B M.	17	43	46.4	+56	48	15	NGC 6449	L. Swift	GX	13.8	1.0′ × 0.8′	PGC 60762
S1–70	1885 Apr 19	17	42	30	+55	45	20	vF; pS; R; 1bM.	17	44	56.6	+55	42	17	NGC 6454	L. Swift	GX	13.5	1.0′ × 0.8′	PGC 60795
S1–71	1885 Jun 8	17	42	45	+66	31	30	F; vS; R; B M. Edward.	17	42	52.8	+66	28	34	NGC 6457	E. Swift	GX	14.2	1.2′ × 0.9′	PGC 60738*
S1–72	1885 Apr 19	17	43	40	+55	49	22	eF; vvS; R; vv diff.; stellar. May be a few e F st.	17	45	47.1	+55	46	36	NGC 6459	L. Swift	GX	14.3	0.7′ × 0.3′	PGC 60817

(continued)

Catalog 1 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S1–73	1885 Jun 5	17	43	58	+61	58	0	F; vvS; R; planetary.	17	44	48.9	+61	54	38	NGC 6462	L. Swift	GX	13.9	0.4′ × 0.4′	PGC 60790
S1–74	1884 Sep 18	17	44	30	+60	57	30	eeeF; R; pS; ee diff.; s of 4 st in form of a square.	17	45	47.6	+60	53	51	NGC 6464	L. Swift	GX	14.3	0.6′ × 0.6′	PGC 60818
S1–75	1884 Sep 18	17	45	0	+51	25	38	eF; vS; R; bet. 2 st. which with 2 others forms a cross like cross in Cygnus. Neb. placed as is Gamma Cygni.	17	48	8.1	+51	23	57	NGC 6466	L. Swift	GX	14.1	0.7′ × 0.4′	PGC 60883
S1–76	1885 Apr 20	17	46	5	+54	11	40	pS; eF; R; 3 st. n. point to it, the n one the brighter.	17	48	21.6	+54	8	57	NGC 6479	L. Swift	GX	13.7	1.0′ × 0.9′	PGC 60890
S1–77	1885 Jun 5	17	48	5	+60	6	10	eeeF; pL; lE; bet. 2 st.; ee diff.; coarse D * s.	17	50	1.4	+60	5	32	NGC 6489	L. Swift	GX	14.2	0.6′ × 0.4′	PGC 60928
S1–78	1885 Jun 13	17	48	40	+61	33	40	vvS; pF; vF * in or just in contact with it; np. of 2.	17	50	0.7	+61	31	54	NGC 6491	L. Swift	GX	13.6	1.2′ × 0.5′	PGC 60949

S1–79	1885 Jun 5	17	48	55	+61	32	20	F; vvS; R; planetary; F * v nr.; sf. of 2.	17	50	22.7	+61	33	33	NGC 6493	L. Swift	GX	14.4	1.1′ × 1.1′	PGC 60961
S1–80	1884 Sep 16	17	49	30	+59	31	17	vvF; pS; lE; diff.; close s of middle * of 3 in a line, middle * the fainter; np. Of 2.	17	51	18.0	+59	28	15	NGC 6497 = NGC 6498	L. Swift	GX	13.5	1.4′ × 0.7′	PGC 60999*
S1–81	1884 Sep 26	17	49	31	+59	30	45	pF; pS; R; B * nr.; F * v nr.; sf. of 2.	17	51	18.0	+59	28	15	NGC 6498 = NGC 6497	L. Swift	GX	13.5	1.4′ × 0.7′	PGC 60999*
S1–82	1884 Jun 17	17	52	30	+72	1	58	S; vF; forms with 3 st. a square.	17	49	46.6	+72	1	16	NGC 6508	E. Hartwig (1883)	GX	12.8	1.3′ × 1.3′	PGC 60938*
S1–83	1884 Oct 9	17	53	40	+60	49	32	F; pL; B M; 2 nearest of 3 st. in a curve point to it.	17	54	39.3	+60	49	4	NGC 6511 = NGC 6510	L. Swift	GX	13.6	0.9′ × 0.6′	PGC 61086*
S1–84	1884 Aug 18	17	57	0	+64	55	57	vF; R; pL; 3 st. in form of a triangle nr. Edward.	17	57	16.4	+64	56	17	NGC 6536	E. Swift	GX	13.4	1.2′ × 1.1′	PGC 61166
S1–85	1885 Jun 8	18	3	8	+56	14	55	F; pS; B M; R; bet. 2 st.	18	5	1.0	+56	15	47	NGC 6562	L. Swift	GX	13.7	0.7′ × 0.7′	PGC 61376
S1–86	1885 Jun 14	18	8	25	+61	24	0	vF; vS; R; nearly bet. 2 st. 1st of 8.	18	9	50.7	+61	25	19	NGC 6592	L. Swift	GX	14.4	0.7′ × 0.6′	PGC 61477
S1–87	1885 Jun 14	18	8	50	+61	6	45	vS; vF; R; bet. a F and a more distant B * 2nd of 8.	18	10	5.6	+61	8	1	NGC 6594	L. Swift	GX	14.2	1.0′ × 0.7′	PGC 61482

(continued)

Catalog 1 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S1–88	1883 Sep 6	18	9	40	+69	1	45	vvF; pS; R; in vacancy; 3 st. in a curve south.	18	8	56.0	+69	4	4	NGC 6598	L. Swift	GX	13.2	1.8′ × 1.3′	PGC 61462
S1–89	1885 Jun 14	18	9	50	+61	9	15	vS; R; vF; diff. by proximity to a B * 3rd of 8.	18	11	13.5	+61	10	50	NGC 6597	L. Swift	GX	14.8	0.9′ × 0.45′	PGC 61520
S1–90	1883 Aug 4	18	10	20	+61	25	15	eF; R; pS; nr. end of a curve of st. 4th of 8.	18	11	44.4	+61	27	12	NGC 6601	L. Swift	GX	14.7	0.7′ × 0.3′	PGC 61533
S1–91	1883 Aug 4	18	10	45	+61	18	5	eF; pS; R; v diff. 5th of 8.	18	12	14.7	+61	19	58	NGC 6607	L. Swift	GX	14.6	0.6′ × 0.5′	PGC 61550
S1–92	1883 Aug 4	18	11	0	+61	18	15	vvS; R; vF; vF * nr. 6th of 8.	18	12	28.9	+61	17	53	NGC 6608	L. Swift	GX	15.6	0.8′ × 0.1′	PGC 61556
S1–93	1883 Aug 4	18	11	5	+61	18	15	vF; lE; pS; F * nr. 7th of 8.	18	12	33.5	+61	19	55	NGC 6609	L. Swift	GX	14.3	0.6′ × 0.6′	PGC 61559
S1–94	1885 Jun 14	18	12	40	+61	16	45	eeeF; pL; R; ee diff.; in vacancy. 8th of 8.	18	14	2.5	+61	19	10	NGC 6617	L. Swift	GX	14.6	1.2′ × 1.0′	PGC 61613
S1–95	1885 Jun 2	18	13	52	+68	19	20	pF; pS; 1bM; R; n of 2. Edward.	18	12	55.3	+68	21	48	NGC 6621	E. Swift	GX	13.1	2.1′ × 0.8′	PGC 61582*
S1–96	1885 Jun 2	18	13	52	+68	19	5	pF; pS; R; 1bM; s of 2.	18	13	0.2	+68	21	12	NGC 6622	L. Swift	GX	15.3	0.6′ × 0.5′	PGC 61579*

S1–97	1883 Sep 11	18	26	50	+73	6	15	pB; R; mbM. Looks like a comet.	18	24	7.6	+73	11	0	NGC 6654	L. Swift	GX	12.0	2.6′ × 2.1′	PGC 61833
S1–98	1885 Jun 8	18	33	25	+67	3	10	pF; pS; R.	18	33	30.5	+67	8	14	NGC 6679	L. Swift	GX	14.4	0.4′ × 0.3′	PGC 62026*
S1–99	1885 Jun 8	18	33	30	+67	45	30	pF; pS; R.	18	30	39.8	+67	59	13	NGC 6678 = NGC 6667 = NGC 6668	L. Swift	GX	12.7	2.3′ × 1.1′	PGC 61972*
S1–100	1883 Jul 11	18	36	0	+59	33	17	eF; pL; R, bet. 2 st., also bet. 2 coarse clusters; np. of 2.	18	37	22.1	+59	38	35	NGC 6687	L. Swift	GX	14.0	1.3′ × 1.3′	PGC 62144

Catalog 2 (Warner observatory)																			
				Equinox 1885.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S2–1	1885 Sep 20	0	0	23	+31	50	2	eF; vS; eE; B * s; vF * v nr.	0	7	19.5	+32	36	33	NGC 7831	L. Swift	GX	12.8	1.7′ × 0.4′	PGC 569
S2–2	1885 Sep 20	0	0	52	+32	17	40	eF: vS; R; bet. 2 st.	0	8	1.6	+33	4	15	NGC 7836	L. Swift	GX	13.7	0.9′ × 0.5′	PGC 608
S2–3	1885 Sep 20	0	2	22	+31	52	47	eF; cE; vS; one of 5 st. which point to it is p nr.	0	9	32.7	+33	18	31	NGC 6 = NGC 20	R. J. Mitchell (1857)	GX	13.0	1.5′ × 1.5′	PGC 679
S2–4	1885 Sep 20	0	3	30	+32	12	47	eeF; lE; in center of 3 v F st. forming an equilatoral triangle, two of them double.	0	10	40.9	+32	58	59	NGC 19	L. Swift	GX	13.2	1.2′ × 0.6′	PGC 759
S2–5	1885 Sep 20	0	3	42	+32	34	17	eF; S; lE.	0	10	46.9	+33	21	10	NGC 21 = NGC 29	W. Herschel (1790)	GX	12.7	1.7′ × 0.8′	PGC 767
S2–6	1885 Sep 7	0	8	45	+47	36	30	eeF; pL; R; e diff. 1st of 3.	0	14	2.2	+48	14	5	NGC 48	L. Swift	GX	13.6	1.4′ × 0.9′	PGC 929
S2–7	1885 Sep 7	0	8	55	+47	37	0	eeeF; S; R; middle one of 3 in a line. 2nd of 3.	0	14	22.4	+48	14	47	NGC 49	L. Swift	GX	13.7	1.1′ × 1.0′	PGC 952

S2–8	1885 Sep 7	0	9	5	+47	36	45	pF; pS; R; B M. 3rd of 3.	0	14	34.9	+48	15	20	NGC 51	L. Swift	GX	13.1	1.3′ × 1.0′	PGC 974
S2–9	1885 Sep 17	0	20	50	+31	4	15	eF; vS; R; forms right angle triangle with 2 st.	0	26	48.7	+31	42	12	NGC 112	L. Swift	GX	13.5	1.1′ × 0.5′	PGC 1654
S2–10	1885 Sep 17	0	42	50	+31	19	45	eF; vS; R; v diff.	0	48	47.1	+31	57	25	NGC 262	L. Swift	GX	13.1	1.1′ × 1.1′	PGC 2855
S2–11	1885 Oct 1	0	51	40	+43	11	25	eeF; lE; pS; iR; D * close f; v diff.	0	57	40.0	+43	47	50	NGC 317	L. Swift	GX	13.9	1.1′ × 0.5′	PGC 3442
S2–12	1885 Sep 6	1	1	30	+39	6	33	eF; eS; R; * nr.	1	8	29.9	+39	41	44	NGC 389	L. Swift	GX	13.8	1.3′ × 0.4′	PGC 4054
S2–13	1885 Sep 17	1	36	10	+12	0	50	p B; p L; v E; nearly bet. 2 p R st If this is Stephan's No. 1 of his Catalogue of 60 nebulae, A. N. 2390, then his description is wrong in every particular.	1	42	9.7	+12	36	7	NGC 658	E. Stephen (1880)	GX	12.5	3.0′ × 1.6′	PGC 6275
S2–14	1885 Sep 17	1	41	10	+12	32	37	eF; pS; R; bet. a D * and a * with a distant companion.	1	46	59.1	+13	7	30	NGC 671	L. Swift	GX	13.2	1.5′ × 0.5′	PGC 6546
S2–15	1885 Sep 12	1	50	50	+44	21	30	vF; pS; lE; several st. nr.	1	57	51.0	+44	55	7	NGC 746	L. Swift	GX	13.0	1.9′ × 1.3′	PGC 7399

(continued)

Catalog 2 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S2–16	1885 Oct 9	1	56	50	−0	38	45	eeF; pS; R; s of 2.	2	2	12.3	−0	6	3	NGC 799	L. Swift	GX	13.0	2.0′ × 1.7′	PGC 7741
S2–17	1885 Oct 9	1	56	50	−0	41	0	eeF; S; R; n. of 2.	2	2	11.8	−0	7	50	NGC 800	L. Swift	GX	13.7	1.0′ × 0.9′	PGC 7740
S2–18	1885 Sep 20	1	57	10	+37	43	10	eF; pS; iR; D * close f; v diff.	2	3	44.9	+38	15	31	NGC 801	L. Swift	GX	13.1	3.2′ × 0.7′	PGC 7847
S2–19	1885 Sep 7	1	57	45	+30	16	45	eeF; vS; R; 1bM; v diff.	2	4	2.1	+30	49	58	NGC 804	L. Swift	GX	13.7	1.4′ × 0.3′	PGC 7873
S2–20	1885 Sep 11	2	20	10	+45	27	5	eF; eS; R; 1 or 2 eF * close; e diff. Powers 132, 200 and 265.	2	28	45.8	+45	58	14	NGC 920 = IC 1799	L. Swift	GX	13.6	1.1′ × 0.4′	PGC 9432*
S2–21	1885 Sep 11	2	21	50	+45	24	0	eF; eS; R; B * nf; e diff. Powers 132, 200 and 265.	2	29	17.5	+45	54	41	NGC 933	L. Swift	GX	13.8	1.3′ × 0.9′	PGC 9465
S2–22	1885 Sep 18	2	21	50	+19	4	29	pB; pS; R; p. a pB * 6 s	2	28	11.1	+19	35	57	NGC 935	L. Swift	GX	12.9	1.7′ × 1.1′	PGC 9388
S2–23	1885 Aug 16	2	38	50	+39	36	38	vF; pL; E.	2	46	0.6	+40	5	25	NGC 1077	L. Swift	GX	13.7	1.3′ × 0.9′	PGC 10468

S2–24	1885 Aug 20	2	40	48	+40	46	2	vF; pS; D * nr.	2	47	56.4	+41	14	47	NGC 1086	L. Swift	GX	12.8	1.5′ × 1.0′	PGC 10587
S2–25	1885 Sep 6	2	45	23	+41	44	0	vF; pS; R; * nr n.	2	52	51.1	+42	12	19	NGC 1122	L. Swift	GX	12.1	1.7′ × 1.3′	PGC 10890
S2–26	1885 Sep 12	2	56	35	+42	57	0	pF; pS; R.	3	3	59.0	+43	23	54	NGC 1171	E. Stephan (1880)	GX	12.3	2.6′ × 1.1′	PGC 11552
S2–27	1885 Sep 12	2	58	35	+43	36	45	pF; cE; pS; sev. v F st. nr.	3	6	14	+44	3	38	NGC 1197	L. Swift				Missing
S2–28	1885 Aug 20	3	3	43	+40	56	0	eF; vS; R. Components of a nr D * point to it.	3	11	13.6	+41	21	49	NGC 1224	L. Swift	GX	13.7	1.4′ × 1.2′	PGC 11886
S2–29	1885 Aug 20	4	5	12	+27	24	30	vF; pL; R; 1bM.	4	12	28.3	+27	42	7	IC 359	L. Swift	GX	13.9	1.3′ × 1.3′	PGC 14653*
S2–30	1884 Nov 24	5	1	5	−3	29	45	Nebulous *; eF; pS; R; p. G. C. 1005 [NGC 1788] 5 s and is about 1.5′ n. of it. G. C. 1005 [NGC 1788] is also a nebulous * = H. V32, which Auwers describes as being nr. and s. f. a B *. This B * is the above nova.	5	6	53.2	−3	20	27	NGC 1788	W. Herschel (1786)	RN		8′ × 5′	LBN 916*

(continued)

Catalog 2 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S2–31	[No date]	6	24	11	+5	7	32	pB; vvL; lE; H. VII; 2 near = G. C. 1424 [NGC 2244]. Vid. Note.	6	30	36.1	+4	58	51	NGC 2237	L. Swift	EN		80′ × 60′	LBN 948*
S2–32	1885 Sep 7	8	1	35	+73	56	11	pB; pL; lE; 1bM; * nr. Edward.	8	15	0.1	+73	34	44	NGC 2523	E. Swift	GX	11.9	3.0′ × 1.8′	PGC 23128
S2–33	1885 Sep 7	8	8	0	+74	19	11	eeF; pS; R; sev. B st. nearly surround it.	8	21	40.3	+73	59	18	NGC 2544	L. Swift	GX	12.9	1.1′ × 0.8′	PGC 23453
S2–34	1885 Sep 7	8	11	0	+74	22	11	eeF; pS; cE; bet. an e F *, and an unequal D *.	8	24	33.6	+74	0	44	NGC 2550	L. Swift	GX	12.8	1.0′ × 0.4′	PGC 23604
S2–35	1885 Sep 7	8	11	30	+73	46	41	pF; vS; R.	8	24	50.3	+73	24	43	NGC 2551	W. Tempel (1882)	GX	12.1	1.7′ × 1.1′	PGC 23608
S2–36	1885 Jun 14	13	45	50	+38	51	20	eeF; pS; R; v diff.; 2 B st. nr.	13	50	54.3	+38	16	28	NGC 5325	L. Swift	GX	14.0	0.9′ × 0.8′	PGC 49163
S2–37	1885 Aug 5	15	32	5	+56	50	10	eS; R; stellar.	15	34	51.1	+56	27	4	NGC 5969	L. Swift	GX	14.4	0.5′ × 0.3′	PGC 55491

S2–38	1885 Aug 5	15	32	45	+56	50	12	eeF; vS; R; 1bM. In field with G.C. 4114–15 [NGC 5963 and NGC 5965].	15	35	36.9	+56	27	42	NGC 5971	L. Swift	GX	13.8	1.6′ × 0.6′	PGC 55529
S2–39	1885 Jul 8	16	8	15	+70	12	29	vF; vS; R; * nr n. Edward.	16	7	53.0	+69	54	18	NGC 6091	E. Swift	GX	13.7	0.4′ × 0.3′	PGC 57242*
S2–40	[No date]	16	15	33	+62	12	45	pF; vS; E; * nr.	16	17	19.8	+61	56	21	NGC 6123	L. Swift	GX	13.8	0.8′ × 0.3′	PGC 57729
S2–41	1885 Aug 3	16	29	45	+59	51	30	vF; pS; lE; v coarse D * nr., forming with it an equilatoral triangle.	16	31	40.9	+59	37	35	NGC 6189 = NGC 6191	L. Swift	GX	12.7	1.9′ × 0.9′	PGC 58440*
S2–42	1883 Oct 30	16	30	0	+58	40	55	vF; pS; R; F * nr.	16	32	6.7	+58	26	20	NGC 6190	L. Swift	GX	12.6	1.4′ × 1.3′	PGC 58458
S2–43	1885 Aug 16	16	41	30	+61	47	54	pB; vS; R.	16	43	4.3	+61	34	44	NGC 6223	H. d″Arrest (1862)	GX	11.8	3.5′ × 2.6′	PGC 58828
S2–44	1885 Aug 11	16	47	0	+70	33	0	eeF; pL; R; bet. a B * and 3 st. in a line; v diff.	16	46	22.8	+70	21	18	NGC 6248	L. Swift	GX	13.1	3.2′ × 1.2′	PGC 58946
S2–45	1885 Aug 13	16	56	40	+59	6	45	eF; pS; R.	16	58	31.4	+58	56	10	NGC 6286	L. Swift	GX	13.3	1.3′ × 1.2′	PGC 59352
S2–46	1885 Aug 13	16	59	0	+59	8	15	eF; pS; R; * nr f; 2 B st. nearly point to it. n. of 2.	17	0	56.4	+58	58	14	NGC 6290	L. Swift	GX	13.5	1.1′ × 1.0′	PGC 59428

(continued)

Catalog 2 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S2–47	1885 Aug 13	16	59	0	+59	6	15	eeF; eS; R. s. of 2.	17	0	55.9	+58	56	15	NGC 6291	L. Swift	GX	13.9	1.1′ × 1.1′	PGC 59435
S2–48	1885 Jul 8	17	1	10	+61	12	3	eF; E; sev. v F st. nr.; v diff.	17	3	3.5	+61	2	38	NGC 6292	L. Swift	GX	13.5	1.5′ × 0.8′	PGC 59498
S2–49	1885 Jul 8	17	2	5	+62	11	5	pB; pS; R; bet. 2 st.; sp. of 2.	17	3	36.6	+62	1	32	NGC 6297 = NGC 6298	L. Swift	GX	13.6	0.7′ × 0.5′	PGC 59525*
S2–50	1885 Aug 1	17	2	10	+62	11	10	vF; eS; R; bet. 2 st.; nf. of 2.	17	3	36.6	+62	1	32	NGC 6298 = NGC 6297	L. Swift	GX	13.6	0.7′ × 0.5′	PGC 59525*
S2–51	1885 Jul 8	17	6	11	+60	52	5	vF; vS; lE. Close to [GC] 4278 [NGC 6310]. sp. of 2.	17	7	36.9	+60	43	43	NGC 6306	L. Swift	GX	13.7	1.0′ × 0.3′	PGC 59654*
S2–52	1885 Jul 8	17	6	28	+61	7	30	pF; vE; 3 st. in line point to it; nf. of 2.	17	7	57.4	+60	59	24	NGC 6310	H. d'Arrest (1861)	GX	13.1	2.0′ × 0.4′	PGC 59662
S2–53	1885 Aug 1	17	16	30	+61	54	10	vF; vS; R; forms are of circle with 2 st., neb. between.	17	17	53.0	+61	46	51	NGC 6359	H. d'Arrest (1861)	GX	12.6	1.2′ × 0.9′	PGC 60025

S2–54	1885 Sep 11	17	19	40	+29	29	45	pF; vS; R; F * close; stellar.	17	24	27.3	+29	23	24	NGC 6364	A. Voigt (1865)	GX	12.9	1.5′ × 1.2′	PGC 60228
S2–55	1883 Aug 17	17	36	20	+68	13	35	eeF; eS; R; e diff. n. of 2.	17	36	5.7	+68	9	21	NGC 6419	L. Swift	GX	14.6	1.0′ × 0.3′	PGC 60543
S2–56	1883 Aug 17	17	36	20	+68	6	50	eeF; eS; R; ee diff. s. of 2.	17	36	16.3	+68	3	8	NGC 6420	L. Swift	GX	14.5	0.7′ × 0.2′	PGC 60553
S2–57	1883 Aug 1	17	36	40	+68	7	20	eF; pS; R; nearly bet. a F and a B *.	17	36	30.0	+68	3	31	NGC 6422	L. Swift	GX	14.1	0.6′ × 0.6′	PGC 60558
S2–58	1883 Aug 1	17	37	10	+68	13	20	eeF; vS; R; * nr. east; v diff.	17	36	53.4	+68	10	17	NGC 6423	L. Swift	GX	14.8	0.3′ × 0.2′	PGC 60576
S2–59	1885 Aug 5	17	37	10	+70	3	0	vF; pS; R.	17	36	12.1	+69	59	20	NGC 6424	L. Swift	GX	13.4	0.9′ × 0.8′	PGC 60552
S2–60	1885 Jul 16	17	41	55	+53	35	13	vF; pS; R; 1bM.	17	44	21	+53	32	24	NGC 6448	L. Swift				Missing
S2–61	1884 Jul 1	17	42	30	+18	37	0	vF; vS; B * f. 8 s; bet. 2 st.	17	47	32	+18	34	29	NGC 6450	L. Swift				Missing
S2–62	1885 Jul 12	18	9	30	−19	55	1	A nebulous D *; pF; sf. of 2. A D * in center of a pF, pL circular atmosphere, each * of the 8.5 mag. and about 20″ distant. A wonderful object, not diff.	18	17	4.9	−19	51	58	NGC 6590 = NGC 6595	J. Herschel (1830)	EN		4′ × 3′	LBN 43

(continued)

Catalog 2 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S2–63	1885 Jul 12	18	9	28	−19	50	1	Another D * in center of an eF, pL nebulosity; np. of 2. Except the inequality of the stars and the excessive faintness of the nebula, it would resemble the preceding.	18	16	51.7	−19	46	41	NGC 6589	T. Safford (1867)	RN		5′ × 4′	LBN 46
S2–64	1885 Jul 14	18	13	15	+22	11	18	vF; eS; eE; forms S. equilatoral triangle with 2 F st.	18	17	41.1	+22	14	19	NGC 6616	L. Swift	GX	13.8	1.4′ × 0.6′	PGC 61693
S2–65	1885 Aug 11	18	13	40	+68	13	57	vF; pS; R; s. of 2. Double.	18	13	0.2	+68	21	12	NGC 6622	L. Swift	GX	15.3	0.6′ × 0.5′	PGC 61579*

S2–66	1885 Aug 11	18	13	40	+68	14	7	vF; pS; R; forms an e close double with the preceding. Very difficult to separate with a power of 265. Well seen.	18	12	55.3	+68	21	48	NGC 6621	E. Swift	GX	13.1	2.1′ × 0.8′	PGC 61582*
S2–67	1883 Sep 11	18	25	45	+67	56	15	vF; vS; R; 2 st. range with it.	18	25	27.9	+68	0	21	NGC 6650	L. Swift	GX	13.9	0.4′ × 0.3′	PGC 61857
S2–68	1885 Jul 14	18	29	45	+22	39	33	pB; pS; R; mbM; bet. 2 st. Larger and b than [GC] 5918 [NGC 6658].	18	34	36.7	+22	54	35	NGC 6660 = NGC 6661	A. Marth (1864)	GX	12.1	1.7′ × 1.1′	PGC 62072
S2–69	1883 Sep 11	18	30	50	+67	54	15	vF; pL; lE; vF D * nr.	18	30	39.8	+67	59	13	NGC 6667 = NGC 6668 = NGC 6678	L. Swift	GX	12.7	2.3′ × 1.1′	PGC 61972*
S2–70	1884 Jun 17	18	39	30	+59	15	45	eeeF; in vacancy pL; sev. B st. f. and p. it; e diff.	18	40	5.0	+59	20	2	NGC 6696	L. Swift	GX	15.1	0.8′ × 0.2′	PGC 62215
S2–71	1883 Aug 6	18	41	45	+60	32	17	pB; pS; vE; F * close to f. end.	18	43	12.4	+60	39	12	NGC 6701	L. Swift	GX	12.1	1.5′ × 1.3′	PGC 62314
S2–72	1885 Aug 5	18	45	45	+47	31	5	vF; pS; R; 1bM.	18	49	0.9	+47	39	29	NGC 6711	L. Swift	GX	12.9	1.1′ × 1.0′	PGC 62456
S2–73	1885 Sep 10	18	58	50	+59	0	15	vF; pS; R.	19	0	36.1	+59	10	0	NGC 6750	L. Swift	GX	13.0	0.9′ × 0.6′	PGC 62671

(continued)

Catalog 2 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S2–74	1884 Aug 15	19	2	25	+55	32	12	pF; vE; 3 vF st. curiously placed in it on the line of major axis which also point to a D *.	19	5	6.3	+55	43	2	NGC 6757	L. Swift	GX	12.9	1.4′ × 1.0′	PGC 62752
S2–75	1884 Apr 30	19	4	30	+63	44	50	eF; vE. S. of 2.	19	5	37.1	+63	56	2	NGC 6762 = NGC 6763	L. Swift	GX	13.3	1.4′ × 0.4′	PGC 62757*
S2–76	1883 Aug 30	19	4	30	+63	45	20	eF; vS; cE; F * nr; D * in field. n. of 2.	19	5	37.1	+63	56	2	NGC 6763 = NGC 6762	L. Swift	GX	13.3	1.4′ × 0.4′	PGC 62757*
S2–77	1885 Jul 4	19	5	20	+50	44	53	pF; pL; cE; sev. vF st. involved.	19	8	16.3	+50	55	59	NGC 6764	L. Swift	GX	11.8	2.3′ × 1.3′	PGC 62806
S2–78	1885 Sep 10	19	14	20	+60	13	0	eeeF; pS; 4 st. in semi circle sf.; e diff.	19	16	10.6	+60	25	3	NGC 6787	L. Swift	GX	13.9	1.2′ × 1.0′	PGC 62987
S2–79	1885 Jul 5	19	19	45	+60	55	17	vF; pS; vE in meridian.	19	21	30.8	+61	8	41	NGC 6796	L. Swift	GX	12.6	1.9′ × 0.4′	PGC 63121
S2–80	1885 Aug 5	19	21	15	+53	23	25	F; vS; R; * v nr; In field with 51 Draconis.	19	24	3.2	+53	37	29	NGC 6798 = IC 1300	L. Swift	GX	13.2	1.6′ × 0.9′	PGC 63171*

S2–81	1885 Sep 10	19	35	45	+62	7	45	eeF; pS; lE; a curve of st. w. like Northern Crown.	19	37	23.3	+62	23	1	NGC 6817	L. Swift	GX	14.5	0.7′ × 0.6′	PGC 63431
S2–82	1884 Sep 18	19	41	0	+63	47	30	eF; vS; F * nr.; v diff. Edward.	19	41	54.9	+64	4	16	NGC 6825	E. Swift	GX	14.4	0.5′ × 0.4′	PGC 63535
S2–83	1884 Aug 26	20	0	5	+65	55	15	pB; R; pS; 2 B st. and it form an arc of a circle.	20	0	42.4	+66	13	39	NGC 6869	L. Swift	GX	12.0	1.5′ × 1.3′	PGC 63972*
S2–84	1885 Jun 9	20	18	30	+66	22	10	eF; L; 1bM; pB * nr.	20	19	38.3	+66	43	42	NGC 6911	L. Swift	GX	14.3	1.7′ × 1.1′	PGC 64485
S2–85	1885 Sep 14	20	35	35	+65	42	12	pB; pL; lE. Discovered many years ago with 4 1/2 inch.	20	37	14.1	+66	6	20	NGC 6951	L. Swift	GX	10.7	3.9′ × 3.2′	PGC 65086
S2–86	1885 Sep 14	20	36	28	+65	21	42	eeeF; pL; R; ee diff.	20	38	0	+65	46	2	NGC 6953	L. Swift				Missing
S2–87	1885 Sep 11	21	0	10	+11	0	50	pF; pS; R; 1bM.	21	5	37.4	+11	24	51	NGC 7015	E. Stephan (1878)	GX	12.5	1.9′ × 1.6′	PGC 66076
S2–88	1884 Oct 10	21	30	45	+12	15	54	Nebulous *; B *; in eeF nebulosity; v diff.; nearly pointed to by 3 st. in a line. Vid. Note.	21	36	53.0	+12	47	19	NGC 7094	L. Swift	PN	13.7	99″ × 91″	PN G066.7–28.2*

(continued)

Catalog 2 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S2–89	1884 Oct 18	21	42	0	+9	42	20	vF; pL; lE; bet. 2 st.; 5 st. w. in form of a pyramid.	21	47	16.6	+10	14	28	NGC 7132	L. Swift	GX	14.2	1.1′ × 0.7′	PGC 67349*
S2–90	1884 Nov 9	21	58	2	+12	6	40	vF; S; R; 1bM; s. of 2.	22	3	30.9	+12	38	12	NGC 7194	L. Swift	GX	13.1	1.1′ × 0.9′	PGC 67945
S2–91	1884 Nov 9	21	58	2	+12	7	40	eeF; R; v diff.; n. of 2.	22	3	30.3	+12	39	38	NGC 7195	L. Swift	GX	14.7	0.5′ × 0.4′	PGC 67940
S2–92	1884 Nov 18	22	35	10	−5	0	34	vF; pS; R.	22	41	26.9	−4	26	41	NGC 7351	E. Stephan (1878)	GX	12.3	1.8′ × 1.3′	PGC 69489
S2–93	1884 Nov 15	22	47	0	−9	51	32	eF; pL; mistaken for Barnard's Comet 1884 II.	22	52	39.3	−9	16	4	NGC 7399	L. Swift	GX	13.7	1.0′ × 0.6′	PGC 69902
S2–94	1885 Oct 31	22	52	37	+13	41	22	eeF; L; R; F * nr. nf.; v diff. Nearly in finder field with Alpha Pegasi.	22	58	10.0	+14	18	32	NGC 7437	L. Swift	GX	13.3	1.8′ × 1.8′	PGC 70131
S2–95	1884 Oct 14	22	55	20	+6	7	42	eeeF; pL; R; e diff.; np. of 2.	23	0	47.5	+6	44	44	NGC 7452	L. Swift	GX	15.0	0.4′ × 0.3′	PGC 1306660*

S2–96	1884 Oct 14	22	55	30	+6	40	42	eF; cE; p S *nr p. Found while searching for Encke's Comet 1885 I.	23	0	41.0	+7	18	11	NGC 7455	L. Swift	GX	14.3	0.6′ × 0.4′	PGC 70246
S2–97	1884 Oct 14	22	55	40	+6	7	40	eeF; pL; R; * nr. sf. of 2.	23	0	59.6	+6	44	58	NGC 7459	L. Swift	GX	14.5	0.6′ × 0.2′	PGC 70261
S2–98	1885 Oct 31	23	3	5	+11	25	49	eF; lE; S; 9 m * close nf.	23	8	57.2	+12	2	53	NGC 7495	L. Swift	GX	13.1	1.8′ × 1.7′	PGC 70566
S2–99	1884 Oct 10	23	6	30	+30	29	43	B; pL; R; B M. Easy in presence of a half moon.	23	12	21.0	+31	7	32	NGC 7512	E. Stephan (1878)	GX	12.6	1.5′ × 1.0′	PGC 70683
S2–100	1885 Oct 31	23	21	40	+11	45	4	eF; pS; R; v diff.; G. C. 4966 [NGC 7671] near; H. is wrong and h. right as to brightness of 4966.	23	27	31.4	+12	23	7	NGC 7672	R. J. Mitchell (1857)	GX	13.9	0.9′ × 0.7′	PGC 71485*

Catalog 3 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S3–1	1885 Nov 10	0	18	5	+15	50	40	vF; pS; vE.	0	24	2.8	+16	29	11	NGC 100	L. Swift	GX	13.3	5.5′ × 0.7′	PGC 1525
S3–2	1885 Nov 10	0	41	35	+7	16	12	eF; vS; R; in center of 3 st in form of right angle triangle.	0	47	16.0	+7	54	36	NGC 250	L. Swift	GX	13.6	1.1′ × 0.6′	PGC 2765
S3–3	1885 Nov 10	0	56	18	−2	33	49	eF; pS; np. of 2.	1	1	57.8	−1	56	12	NGC 351	L. Swift	GX	13.2	1.4′ × 0.8′	PGC 3693
S3–4	1885 Nov 10	0	56	40	−2	35	21	eF; pS; R; sf. of 2.	1	2	24.5	−1	57	33	NGC 353	L. Swift	GX	13.7	1.3′ × 0.4′	PGC 3714
S3–5	1885 Nov 30	1	21	51	+47	47	30	eF; pS; R; D * nr. s.	1	28	29.2	+48	23	13	NGC 562	L. Swift	GX	13.3	1.3′ × 1.0′	PGC 5502
S3–6	1885 Nov 30	1	26	10	−7	28	50	vF; pL; R; v 1bM; sf. of [GC] 363 [NGC 615]; [GC] 351 [NGC 596] in field.	1	31	36.8	−6	53	37	NGC 586	W. Herschel (1785)	GX	13.2	1.6′ × 0.8′	PGC 5679
S3–7	1885 Nov 30	1	26	43	+35	4	0	eF; pS; R; B * nr. sf; 1bM.	1	33	31.2	+35	40	6	NGC 591	T. Safford (1866)	GX	12.9	1.3′ × 1.0′	PGC 5800

S3–8	1885 Dec 2	1	53	5	−0	2	47	eF; pS; R; B * 32 s f.	1	58	41.0	+0	31	45	NGC 768	L. Swift	GX	13.2	1.7′ × 0.8′	PGC 7465*
S3–9	1885 Nov 30	2	5	6	+44	2	15	vF; pL; R; nearly bet. a pB * and 3 vF equal mag. st close together in line.	2	12	12.3	+44	34	6	NGC 847 = NGC 846	E. Stephan (1876)	GX	12.1	1.9′ × 1.7′	PGC 8430
S3–10	1885 Nov 30	2	5	25	+3	13	53	eF; pS; R; v diff. Edward.	2	11	12.1	+3	46	47	NGC 851	E. Swift	GX	13.7	1.0′ × 0.6′	PGC 8368
S3–11	1885 Dec 2	2	20	30	+11	38	18	vF; vS; R; in vacancy.	2	26	37.3	+12	9	19	NGC 927	J. Palisa (1885)	GX	13.4	1.2′ × 1.2′	PGC 9292
S3–12	1885 Nov 7	2	22	40	+31	7	16	vF; eS; R; B M; 5239 nr; v diff.	2	29	27.5	+31	38	27	NGC 940	H. d′Arrest (1865)	GX	12.4	1.2′ × 1.0′	PGC 9478
S3–13	1885 Oct 17	2	30	50	+1	33	32	eeF; pS; R; vF * close; bet. a pB *, and a F D *; np. of 2; not [GC] 5251 [= NGC 993], [GC] 5264 (= NGC 1016] nor [GC] 602 [= NGC 1073].	2	36	46.0	+2	3	2	NGC 994 = NGC 993	A. Marth (1865)	GX	13.6	0.9′ × 0.8′	PGC 9910*
S3–14	1885 Oct 17	2	31	40	+1	28	17	eeF; eS; pF * v close; sf. of 2.	2	37	41.8	+1	58	31	NGC 1004	E. Stephan (1880)	GX	12.7	1.4′ × 1.3′	PGC 9961
S3–15	1886 Jan 1	2	32	6	+1	48	32	eeF; pS; R; 9 mag. * sf.; v diff. Edward.	2	38	19.1	+2	18	36	NGC 1009	E. Swift	GX	14.4	1.4′ × 0.2′	PGC 9995

(continued)

Catalog 3 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S3–16	1885 Oct 17	2	34	15	+1	0	50	eeF; pS; R.	2	40	6.3	+1	30	31	NGC 1038	L. Swift	GX	13.4	1.2′ × 0.4′	PGC 10096*
S3–17	1885 Nov 10	2	34	48	−8	56	25	eeF; L; R; [GC] 582 and [GC] 589 In field sp. of 2.	2	40	24.0	−8	26	1	NGC 1042	L. Swift	GX	11.0	4.7′ × 3.6′	PGC 10122*
S3–18	1885 Nov 10	2	35	0	−8	39	25	eeeF; pS; R; e diff.; 582 and 589 In field.	2	40	32.8	−8	8	51	NGC 1047	L. Swift	GX	14.3	1.3′ × 1.0′	PGC 10132
S3–19	1885 Nov 10	2	35	0	−9	2	26	eeF; pS; R; sf. of 2.	2	40	37.9	−8	32	0	NGC 1048	L. Swift	GX	14.5	1.0′ × 0.2′	PGC 10140
S3–20	1885 Dec 29	2	38	10	−15	14	50	vF; pS; R; B * 22 s f.	2	43	29.3	−14	45	16	NGC 1076	L. Swift	GX	12.3	1.8′ × 1.1′	PGC 10313
S3–21	1885 Dec 26	2	42	30	−14	26	45	eeF; S; lE; 11 mag. * close f; 15 mag. * involved; e diff. * to see.	2	48	6.2	−13	57	27	NGC 1103	L. Swift	GX	12.9	2.1′ × 0.5′	PGC 10597
S3–22	1885 Oct 17	2	48	15	+2	28	30	vF; pS; R; 1bM.	2	54	2.7	+2	57	44	NGC 1137	L. Swift	GX	12.4	2.1′ × 1.3′	PGC 10942

S3–23	1885 Nov 10	2	51	23	−8	9	40	eF; pS; R; np. of 2; v diff.	2	57	4.3	−7	41	8	NGC 1148	L. Swift	GX	12.7	1.6′ × 0.8′	PGC 11148
S3–24	1885 Nov 10	2	51	55	−8	13	40	eeF; S; R; v diff.; * nr. s; sf. of 2.	2	57	33.7	−7	45	31	NGC 1152	L. Swift	GX	14.5	1.0′ × 0.7′	PGC 11182
S3–25	1885 Nov 10	3	12	18	−8	3	10	eF; eS; R; 4 B st. in form of arc of circle close s.	3	17	48.5	−7	37	1	NGC 1286	L. Swift	GX	13.8	0.9′ × 0.7′	PGC 12250
S3–26	1885 Nov 10	3	22	30	−8	47	56	vL; vE nearly in meridian; eF.	3	28	6.0	−8	23	19	NGC 1337	L. Swift	GX	11.9	5.8′ × 1.5′	PGC 12916
S3–27	1886 Feb 24	3	48	0	+68	17	5	vF; vS; R; B * nr.	4	0	27.7	+68	34	40	NGC 1469	L. Swift	GX	12.7	1.9′ × 0.8′	PGC 14261
S3–28	1886 Feb 24	3	52	36	+70	42	55	eF; pS; R.	4	5	4.0	+70	59	48	NGC 1485	L. Swift	GX	12.6	2.1′ × 0.7′	PGC 14432
S3–29	1885 Nov 10	4	20	50	−10	22	29	vF; pL; R; 1bM; * nr. S.	4	26	20.4	−10	5	54	NGC 1577	L. Swift	GX	12.2	1.4′ × 1.3′	PGC 15090
S3–30	1885 Dec 29	4	28	50	−8	49	55	pF; S; R; 1bM.	4	34	0.0	−8	34	45	NGC 1614	L. Swift	GX	12.9	1.3′ × 1.1′	PGC 15538
S3–31	1885 Dec 29	4	39	22	−8	41	24	eeeF; pS; ee diff.; nf. of [GC] 895 [= NGC 1646].	4	44	34.8	−8	28	43	NGC 1648	L. Swift	GX	14.5	0.4′ × 0.3′	PGC 15920

(continued)

Catalog 3 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S3–32	1885 Dec 2	4	53	50	−11	18	14	eF; vS; R; v diff.; 1st of 3. Tempel's 4 h 53 m 52 s −11° 9′′ 24″ in field; previously discovered by Barnard.	4	59	17.4	−11	7	7	NGC 1721	E. E. Barnard (1885)	GX	12.3	2.5′ × 1.4′	PGC 16484*
S3–33	1885 Dec 2	4	54	5	−11	18	29	eeF; vS; R; e diff.; 2nd of 3. Tempel's 4 h 53 m 52 s −11° 9′ 24″ in field; previously discovered by Barnard.	4	59	22.9	−11	7	56	NGC 1725	E. E. Barnard (1885)	GX	12.3	1.9′ × 1.2′	PGC 16488*
S3–34	1885 Dec 2	4	54	15	−11	18	14	eF; vS; R; v diff.; 3rd of 3. Tempel's 4 h 53 m 52 s −11° 9′ 24″ in field; previously discovered by Barnard.	4	59	27.7	−11	7	22	NGC 1728	E. E. Barnard (1885)	GX	12.9	1.8′ × 0.9′	PGC 16495*

S3–35	1885 Dec 26	5	5	30	+5	3	42	vF; S; R.	5	11	46.2	+5	12	2	NGC 1819	L. Swift	GX	12.4	1.7′ × 1.2′	PGC 16899
S3–36	1886 Feb 27	6	26	20	+5	11	53	eeF; L; iR; e diff. Probably an offshoot of 31 of my catalogue No.2 [= NGC 2237]. Two or three others suspected.	6	32	27	+5	6	58	NGC 2246	L. Swift	EN			LBN 949*
S3–37	1885 Nov 15	7	52	10	+8	18	30	eeeF; pS; iR; B * nr. w; sp. of 2; e diff.	7	58	27.4	+7	59	2	NGC 2491	L. Swift	GX	15.1	0.6′ × 0.3′	PGC 22353
S3–38	1885 Nov 15	7	52	25	+8	19	50	vF; pS; R; 1bM; * close f; nf. of 2.	7	58	37.4	+8	1	47	NGC 2496	L. Swift	GX	13.0	1.4′ × 1.2′	PGC 22359
S3–39	1886 Mar 9	8	29	50	−1	27	38	vF; S; R; * nr. nf.; a more distant * in line with both.	8	35	34.1	−1	51	0	NGC 2616	L. Swift	GX	12.5	1.6′ × 1.3′	PGC 24129
S3–40	1886 Feb 8	8	40	30	−33	25	10	pF; pS; lE.	8	45	8.2	−33	47	41	NGC 2663	L. Swift	GX	10.9	3.5′ × 2.4′	PGC 24590
S3–41	1886 Mar 10	8	46	30	−2	11	20	pF; pE; S.	8	52	38.0	−2	36	12	NGC 2690	L. Swift	GX	13.1	1.9′ × 0.5′	PGC 24926
S3–42	1886 Feb 27	8	50	20	−2	8	8	vF; pS; vE; * nr. f.	8	56	12.3	−2	33	48	NGC 2706	L. Swift	GX	13.0	1.8′ × 0.6′	PGC 25102

(continued)

Catalog 3 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S3–43	1886 Feb 27	9	15	10	−16	1	36	eF; pS; vE; [GC] 1829 [= NGC 2848], R. nova and 1828 in field w. Did not see [GC] 1819 [= NGC 2837] east of 1829.	9	20	30.2	−16	29	43	NGC 2851	L. Swift	GX	13.6	1.4′ × 0.5′	PGC 26422
S3–44	1886 Feb 9	9	20	16	−11	30	35	eF; pS; p a coarse D * 17 s; in field with [GC] 1854 [= NGC 2889].	9	25	54.7	−11	59	47	NGC 2881	L. Swift	GX	13.3	1.1′ × 0.9′	PGC 26747
S3–45	1886 Mar 10	9	24	20	+4	37	59	eeF; pL; R; in vacancy.	9	30	15.3	+4	8	40	NGC 2900	L. Swift	GX	13.0	1.7′ × 1.4′	PGC 26974
S3–46	1886 Mar 10	9	37	22	−9	14	32	eF; S; R; s of 2; [GC] 1908 [NGC 2980] in field nr.	9	43	16.8	−9	44	44	NGC 2978	L. Swift	GX	12.7	1.1′ × 0.9′	PGC 27808
S3–47	1886 Apr 21	9	42	45	+32	43	55	eeF; eS; stel; a row of 8 or 10 p B. st nr p.	9	49	41.2	+32	13	16	NGC 3011	L. Swift	GX	13.3	0.9′ × 0.8′	PGC 28259

S3–48	1886 Mar 10	9	43	20	+1	7	55	vF; pS; lE; * nr. n; p of 2.	9	49	41.4	+0	37	16	NGC 3018	E. Stephan (1880)	GX	13.3	1.2′ × 0.7′	PGC 28258
S3–49	1886 Mar 10	9	43	35	+1	7	55	pF; pL; cE; f of 2.	9	49	52.6	+0	37	4	NGC 3023	E. Stephan (1880)	GX	13.0	2.9′ × 1.4′	PGC 28272
S3–50	1886 May 22	9	44	25	+29	4	0	eeF; pS; lE; e diff.; in vacancy, found searching for Winnecke's comet.	9	50	55.3	+28	33	4	NGC 3026	L. Swift	GX	13.0	2.7′ × 0.8′	PGC 28351
S3–51	1886 Feb 8	9	44	40	−7	24	22	pF; pS; R.	9	48	54.0	−8	3	3	NGC 3029	L. Swift	GX	14.0	1.4′ × 0.9′	PGC 28206*
S3–52	1886 Feb 27	9	46	15	−32	13	34	pB; pS; R.	9	51	15.4	−32	45	9	NGC 3038	L. Swift	GX	11.6	2.5′ × 1.3′	PGC 28376
S3–53	1886 Feb 27	9	56	25	−31	7	50	eF; pL; R; coarse D * nr. p; [GC] 2002 (= NGC 3108] in field.	10	0	40.8	−31	39	52	NGC 3103 = NGC 3100	J. Herschel (1836)	GX	11.1	3.2′ × 1.6′	PGC 28960
S3–54	1886 Apr 2	10	20	20	−2	3	29	vF; S; lE; bet. a pB and a vF *.	10	26	21.5	−2	37	20	NGC 3243	L. Swift	GX	12.6	1.4′ × 1.1′	PGC 30655
S3–55	1886 Apr 27	10	22	15	+13	16	18	vF; pS; R.	10	28	27.3	+12	42	14	NGC 3253	L. Swift	GX	13.6	1.2′ × 1.1′	PGC 30829
S3–56	1886 Mar 5	10	26	45	−21	42	46	eF; vS; middle one of 3 eF st. involved in neby. Two B st. point to it.	10	32	21.9	−22	18	8	NGC 3282	L. Swift	GX	13.0	1.9′ × 0.6′	PGC 31129

(continued)

Catalog 3 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S3–57	1886 Apr 27	10	31	0	+13	13	18	F; S; R; sf. of [GC] 2147 [= NGC 3299].	10	37	10.2	+12	39	9	NGC 3306	L. Swift	GX	13.5	1.3′ × 0.5′	PGC 31528
S3–58	1886 Mar 5	10	54	5	+18	11	38	eeF; pS; R; e diff.; in vacancy.	11	0	46.5	+17	35	16	NGC 3487	L. Swift	GX	13.8	0.9′ × 0.4′	PGC 33195
S3–59	1883 Apr 26	11	0	15	+20	42	10	pF; vS; lE; in starless field.	11	6	40.5	+20	5	8	NGC 3522	L. Swift	GX	13.1	1.2′ × 0.7′	PGC 33615
S3–60	1886 Mar 5	11	16	15	+21	19	55	eF; S; R; bet. 2 st.	11	22	35.4	+20	42	15	NGC 3650	L. Swift	GX	13.9	1.7′ × 0.3′	PGC 34913
S3–61	1886 Apr 27	11	50	15	−2	6	14	pB; vS; R.	11	56	1.1	−2	43	15	NGC 3979 = IC 2976	E. Holden (1881)	GX	12.9	1.1′ × 0.9′	PGC 37488*
S3–62	1886 Apr 27	12	11	40	−10	40	57	pB; eS; pB * nr. p; Looks at first like a D *. Curious object.	12	17	24.3	−9	57	6	NGC 4243 = NGC 4240	W. Tempel (1875)	GX	12.4	1.3′ × 1.2′	PGC 39411*
S3–63	1886 May 6	12	13	45	−11	37	5	vF; pS; R.	12	19	42.2	−12	13	32	NGC 4265 = NGC 4263	W. Herschel (1786)	GX	12.6	1.2′ × 0.6′	PGC 39698
S3–64	1886 May 6	12	14	25	−11	4	3	eeF; vS; R; 1st of 3.	12	20	25.0	−11	39	59	NGC 4279	L. Swift	GX	13.6	1.1′ × 0.7′	PGC 39812
S3–65	1886 May 6	12	14	30	−11	3	33	eeeF; vS; R; 2nd of 3.	12	20	26	−11	41	52	NGC 4280	L. Swift	AST			Three stars

S3–66	1886 May 6	12	14	45	−11	0	33	eF; pS; R; 3rd of 3.	12	20	39.8	−11	38	31	NGC 4285	L. Swift	GX	14.1	0.9′ × 0.5′	PGC 39842
S3–67	1886 Jun 3	13	12	50	−11	58	10	eeF; eS; vF * v close; Looks like a D * at first; Another nr.; 6 in field, H.III.117 [= NGC 5076], II.193 [= NGC 5077], III.118 [= NGC 5079], R. nova and [GC] 5730 (= NGC 5072].	13	19	12.6	−12	32	23	NGC 5070 = NGC 5072	H. d′Arrest (1867)	GX	13.7	1.0′ × 0.7′	PGC 46432*
S3–68	1886 Jun 3	13	14	59	−11	54	40	eF; eS; R; stellar; nearly bet. 2 st.	13	20	59.7	−12	28	16	NGC 5097	L. Swift	GX	14.7	0.5′ × 0.3′	PGC 46602
S3–69	1886 Jun 3	13	15	15	−12	28	55	eF; eS; R.	13	21	19.7	−13	2	31	NGC 5099	L. Swift	GX	14.6	0.6′ × 0.6′	PGC 46627
S3–70	1886 Jun 3	13	15	43	−12	37	10	eF; pS; lE; D * in field.	13	21	49.1	−13	12	24	NGC 5105	L. Swift	GX	11.8	2.0′ × 1.5′	PGC 46664
S3–71	1886 Jun 3	13	16	45	−12	24	10	eF; pS; R; in line with 2 pB st.	13	22	56.5	−12	57	53	NGC 5110 = NGC 5111	W. Herschel (1784)	GX	11.7	1.9′ × 1.6′	PGC 46737
S3–72	1886 Jan 1	13	29	25	+48	30	5	eF; L; vE; v diff.	13	34	2.8	+47	54	56	NGC 5229	L. Swift	GX	13.7	3.3′ × 0.6′	PGC 47788
S3–73	1886 Mar 29	13	31	15	−7	54	58	pF; eS; vF * v close.	13	36	39.9	−8	24	7	NGC 5241	L. Swift	GX	14.2	1.2′ × 0.5′	PGC 48043

(continued)

Catalog 3 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S3–74	1886 Apr 8	13	44	25	+70	54	18	vF; eS; stellar; An eF * v close; the 2 components of a D * point to it.	13	46	11.4	+70	20	23	NGC 5314	L. Swift	GX	13.8	0.8′ × 0.5′	PGC 48810
S3–75	1886 May 6	13	47	5	+73	12	33	eF; S; R.	13	48	59.9	+72	39	14	NGC 5340	L. Swift	GX	14.2	0.5′ × 0.4′	PGC 49021
S3–76	1886 May 6	13	48	20	+74	29	35	vF; S; R.	13	50	12.1	+73	57	11	NGC 5344	L. Swift	GX	14.4	0.6′ × 0.4′	PGC 49085
S3–77	1884 Jun 18	13	55	30	+74	8	50	pF; S; R; D * nr. p.	13	57	13.6	+73	37	0	NGC 5412	L. Swift	GX	13.4	1.2′ × 1.0′	PGC 49644
S3–78	1886 Apr 8	13	55	45	+71	17	48	eF; vS; R; forms a triangle with 2 F st.	13	56	57.0	+70	45	16	NGC 5415	L. Swift	GX	14.0	1.0′ × 0.6′	PGC 49610
S3–79	1886 Jun 6	14	6	55	+13	49	22	vF; pS; bet. a single and a D *.	14	12	32.0	+13	18	16	NGC 5505	L. Swift	GX	13.2	1.0′ × 0.8′	PGC 50745
S3–80	1886 Jun 4	14	16	15	+13	44	22	vF; pS; R; pB * nr; also a F one.	14	21	40.5	+13	13	56	NGC 5583	L. Swift	GX	13.4	0.8′ × 0.6′	PGC 51313
S3–81	1886 Jun 4	14	16	35	+13	42	37	eF; vS; R; nearly bet. 2 B st.	14	22	8	+13	11	5	NGC 5586	L. Swift				Missing

S3–82	1886 Jun 4	14	16	55	+14	12	22	eF; S; R; pB * nr. sf.	14	22	33.3	+13	43	2	NGC 5591	L. Swift	GX	13.9	1.3′ × 0.6′	PGC 51360
S3–83	1886 Jun 6	14	41	25	+14	7	22	eF; pS; R; B * f 22 s.	14	47	2.1	+13	40	6	NGC 5758	L. Swift	GX	13.5	1.0′ × 0.9′	PGC 52787
S3–84	1886 May 22	14	43	25	+12	55	20	vF; S; R; p of 2.	14	48	42.6	+12	27	25	NGC 5762	L. Swift	GX	12.7	1.5′ × 1.3′	PGC 52887
S3–85	1886 May 22	14	43	50	+12	57	20	eeeF; pS; ee diff.; f of 2.	14	48	58.7	+12	29	25	NGC 5763	L. Swift	GX	14.3	0.5′ × 0.5′	PGC 52905
S3–86	1886 Jun 8	16	0	15	+18	26	58	eeeF; S; R; ee diff.; 1st of 4.	16	5	32.6	+18	9	34	NGC 6053 = NGC 6057	L. Swift	GX	13.8	1.0′ × 0.6′	PGC 57076*
S3–87	1886 Jun 8	16	0	20	+18	26	58	eeeF; S; R; ee diff.; 2nd of 4.	16	5	39.6	+18	9	52	NGC 6055	L. Swift	GX	14.7	0.6′ × 0.6′	PGC 57090*
S3–88	1886 Jun 8	16	0	25	+18	14	57	eeeF; pS; R; ee diff,; 3rd of 4.	16	5	31.3	+17	57	49	NGC 6056 = IC 1176	L. Swift	GX	13.9	0.9′ × 0.5′	PGC 57075*
S3–89	1886 Jun 6	16	0	30	+18	26	30	eeeF; eS; R.	16	5	32.6	+18	9	34	NGC 6057 = NGC 6053	L. Swift	GX	13.8	1.0′ × 0.6′	PGC 57076*
S3–90	1886 Jun 8	16	1	3	+18	33	30	eeeF; S; R; ee diff.; 4th of 4; 4 B st. s with the neb., form a cross like cross in Cygnus. Neb. placed as is Deneb Cygni.	16	6	16.1	+18	15	0	NGC 6061	L. Swift	GX	13.7	1.0′ × 0.8′	PGC 57137
S3–91	1886 May 6	16	1	5	−6	6	10	vF; S; R.	16	6	48.1	−6	23	37	NGC 6059	L. Swift	AST			double star*

(continued)

Catalog 3 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S3–92	1886 Jun 6	16	8	0	+18	3	15	eeeF; pS; R; eee diff.	16	14	16.7	+17	45	26	NGC 6084	L. Swift	GX	13.9	1.0′ × 0.5′	PGC 57575
S3–93	1886 May 27	16	9	15	+61	32	4	eF; p S; R; in line with 2 st.	16	11	11.0	+61	16	5	NGC 6095	L. Swift	GX	12.6	1.8′ × 1.6′	PGC 57411
S3–94	1886 May 30	17	33	45	+74	26	5	eeeF; pS; R; ee diff; bet 2 st.; 4 F st. nr. p in form of arc of circle.	17	30	36.8	+74	22	34	NGC 6414	L. Swift	GX	14.4	1.1′ × 0.6′	PGC 60416
S3–95	1886 May 30	17	45	45	+51	10	10	pB; S; eE; spindle.	17	48	38.4	+51	9	26	NGC 6478	L. Swift	GX	13.3	1.9′ × 0.7′	PGC 60896
S3–96	1886 May 28	17	53	30	+62	39	20	eF; pS; vE; np. of 2.	17	54	50.4	+62	38	42	NGC 6512	H. d'Arrest (1861)	GX	13.9	0.7′ × 0.5′	PGC 61089
S3–97	1886 May 28	17	53	50	+62	40	20	eeF; vS; R; pB * nr. p; sf. of 2.	17	55	16.9	+62	40	12	NGC 6516	H. d'Arrest (1861)	GX	14.8	0.6′ × 0.2′	PGC 61109

S3–98	1886 May 28	17	54	20	+62	36	20	eF; pL; 2 B st nr. f.	17	55	48.5	+62	36	43	NGC 6521	H. d'Arrest (1861)	GX	12.9	1.6′ × 1.3′	PGC 61121
S3–99	1884 Jul 2	17	54	44	+50	45	15	vF; vS; R; 2 B st. nr.; in finder field with Gamma Draconis.	17	57	25.2	+50	43	41	NGC 6515	L. Swift	GX	13.0	1.6′ × 1.0′	PGC 61167
S3–100	1885 Oct 25	18	33	30	+67	0	55	eF; eS; bet. a * v close, and a vF D *.	18	33	30.5	+67	8	14	NGC 6679	L. Swift	GX	14.4	0.4′ × 0.3′	PGC 62026*

Catalog 4 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S4–1	1886 Aug 9	0	28	30	−10	20	7	pF; pS; R; * near nf.	0	34	2.8	−9	42	19	NGC 153 = NGC 151	W. Herschel (1785)	GX	11.6	3.7′ × 1.7′	PGC 2035
S4–2	1886 Sep 1	0	28	40	−11	23	25	pF; S; R.	0	34	40.1	−10	46	0	NGC 155	L. Swift	GX	12.7	1.7′ × 1.2′	PGC 2076
S4–3	1886 Aug 9	0	30	25	−10	45	20	eF; vS; R; v diff; only 1 * v. near.	0	35	59.9	−10	7	18	NGC 163	H. d'Arrest (1865)	GX	12.7	1.5′ × 1.2′	PGC 2149
S4–4	1886 Aug 9	0	36	0	−10	38	48	vF; pS; R.	0	41	33.9	−10	1	17	NGC 217	W. Herschel (1785)	GX	12.7	2.5′ × 0.7′	PGC 2482
S4–5	1886 Sep 2	1	9	30	−2	13	33	pB; vS; lE,	1	15	16.6	−1	37	35	NGC 448	L. Swift	GX	12.1	1.6′ × 0.8′	PGC 4524
S4–6	1886 Sep 1	1	46	50	+11	28	54	eF; S; R; B * nr. f.	1	52	59.7	+12	42	31	NGC 716 = IC 1743	L. Swift	GX	12.9	1.8′ × 0.8′	PGC 6982*
S4–7	1886 Sep 2	2	1	40	+16	39	30	eF; vS; R; right angled with 2 st.	2	7	33.7	+17	12	9	NGC 817	L. Swift	GX	13.2	0.7′ × 0.3′	PGC 8109
S4–8	1885 Oct 30	2	27	30	+31	59	21	eeF; S; vE; pB * nr, sp.	2	34	20.1	+32	30	20	NGC 973	L. Swift	GX	12.8	3.7′ × 0.5′	PGC 9795
S4–9	1886 Sep 1	2	30	5	+11	8	56	vF; S; R; B M; forms trap. With 3 st.	2	36	18.2	+11	38	31	NGC 990	W. Herschel (1786)	GX	12.5	1.8′ × 1.5′	PGC 9890

S4–10	1886 Sep 6	2	30	47	+20	35	53	pF; pS; c E; * nr. s.	2	37	25.5	+21	6	3	NGC 992	L. Swift	GX	12.6	0.9′ × 0.7′	PGC 9938
S4–11	1883 Aug 31	2	56	55	+42	22	51	vF; pS; lE; in contact on p. side with a pB *; D * np. points to it ab. 4.5″ = mag.	3	5	30.8	+42	50	8	NGC 1174 = NGC 1186	W. Herschel (1786)	GX	11.4	3.2′ × 1.2′	PGC 11617*
S4–12	1886 Sep 6	3	2	20	+3	39	44	pF; pS; R.	3	8	26.3	+4	6	39	NGC 1218	L. Swift	GX	12.7	1.3′ × 1.0′	PGC 11749
S4–13	1886 Sep 1	3	12	50	−2	23	24	vF; S; R; 4 st f. in a row.	3	18	49.8	−1	58	24	NGC 1289	L. Swift	GX	12.6	1.8′ × 1.1′	PGC 12342
S4–14	1884 Jun 11	14	2	2	+66	14	59	eF; vS; R; nearly bet. 2 st.	14	5	57.4	+65	41	26	NGC 5479	L. Swift	GX	14.1	0.7′ × 0.5′	PGC 50282
S4–15	1886 Jun 20	14	49	5	+19	7	4	eeeF; pS; R; pB * close f; ee diff.	14	54	31.5	+18	38	33	NGC 5778	L. Swift	GX	13.8	1.2′ × 0.9′	PGC 53279
S4–16	1886 Jun 20	14	56	45	+19	8	49	eeF; pS; lE; pB * close f; easily overlooked.	15	2	1	+18	41	35	NGC 5825	L. Swift				Missing
S4–17	1886 Jul 22	14	59	30	+29	57	20	eeeF; pS; lE; ee diff.	15	4	21	+29	30	24	NGC 5840	L. Swift				Missing
S4–18	1886 Jun 28	15	51	20	+65	11	53	eeeF; S; R; D * points to it; ee diff.	15	52	9.1	+64	50	26	NGC 6019	L. Swift	GX	15.4	0.4′ × 0.4′	PGC 56265
S4–19	1886 Jun 28	15	52	5	+65	15	38	pF; pS; R; B M; * close; forms a little right angle with 2 st.	15	53	7.9	+64	55	5	NGC 6024	L. Swift	GX	14.1	0.7′ × 0.6′	PGC 56294

(continued)

Catalog 4 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S4–20	1886 Jun 19	15	58	18	+17	32	30	eeeF; vS; R; eee diff.	16	3	32.1	+17	11	55	NGC 6034	L. Swift	GX	13.8	1.1′ × 0.8′	PGC 56877
S4–21	1886 Jun 27	15	59	15	+18	0	40	eeeF; vS; R; sp. of 3 in a line; the other 2 being 2 of Stephan's; 3rd of 10. See note.	16	4	39.5	+17	42	3	NGC 6039 = NGC 6042	L. Swift	GX	13.9	0.9′ × 0.7′	PGC 56972*
S4–22	1886 Jun 27	15	59	38	+18	6	3	eeF; lE; pS; 4th of 10.	16	5	1.5	+17	46	33	NGC 6043	L. Swift	GX	14.3	0.7′ × 0.5′	PGC 57019
S4–23	1886 Jun 27	15	59	40	+18	12	3	eeF; vS; R; vf * nr. p; 5th of 10.	16	4	59.7	+17	52	13	NGC 6044	L. Swift	GX	14.3	0.6′ × 0.6′	PGC 57015
S4–24	1886 Jun 27	15	59	45	+18	5	3	eeF; vS; R; v diff.; 6th of 10.	16	5	7.9	+17	45	28	NGC 6045	L. Swift	GX	13.9	1.3′ × 0.3′	PGC 57031
S4–25	1886 Jun 27	15	59	50	+18	2	33	eF; R; pS; F * close north; 7th of 10.	16	5	9.0	+17	43	47	NGC 6047	L. Swift	GX	13.5	1.0′ × 0.8′	PGC 57033
S4–26	1886 Jun 27	16	0	0	+18	4	33	eeeF; S; R; e diff.; 8th of 10.	16	5	23.4	+17	45	26	NGC 6050 = IC 1179	L. Swift	GX	14.7	0.9′ × 0.6′	PGC 57058*

S4–27	1886 Jun 27	16	0	15	+18	5	28	eeeF; pS; lE; f * v nr. sp.; 9th of 10.	16	5	38.1	+17	46	5	NGC 6054 = IC 1183	L. Swift	GX	14.5	0.8′ × 0.4′	PGC 57086
S4–28	1886 Jul 3	16	10	52	+1	9	22	eeF; vS; a B and a F * nr. np. point to it; an ee F * close p; e diff.	16	16	52.4	+0	50	28	NGC 6100	L. Swift	GX	13.0	1.9′ × 1.1′	PGC 57706
S4–29	1886 Jul 6	16	17	0	+58	15	45	pF; vS; R.	16	19	11.6	+57	59	3	NGC 6127 = NGC 6125 = NGC 6128	L. Swift	GX	12.0	1.4′ × 1.4′	PGC 57812*
S4–30	1886 Jun 28	16	17	6	+58	16	20	pF; pS; R; BM.	16	19	11.6	+57	59	3	NGC 6128 = NGC 6125 = NGC 6127	L. Swift	GX	12.0	1.4′ × 1.4′	PGC 57812*
S4–31	1886 Jun 28	16	17	24	+57	54	5	pF; pL; R; B * nr. p.	16	19	33.5	+57	36	54	NGC 6130	L. Swift	GX	13.5	1.0′ × 0.7′	PGC 57828
S4–32	1886 Jul 9	16	18	5	+65	10	30	vF; vS; cE; 2 st. nr.	16	19	0	+64	54	3	NGC 6135	L. Swift				Missing
S4–33	1886 Jul 6	16	18	32	+56	15	3	eeeF; S; R; nearly bet. 5 pB st. in a curve n. and 3 F st. in a curve s; ee diff.	16	20	59.4	+55	58	14	NGC 6136	L. Swift	GX	14.5	0.9′ × 0.4′	PGC 57892
S4–34	1886 Jun 28	16	23	16	+55	37	18	eeF; pS; R; v diff.	16	25	48.4	+55	21	39	NGC 6157	L. Swift	GX	14.5	0.6′ × 0.5′	PGC 58101
S4–35	1886 Jul 9	16	25	5	+59	49	12	eeF; vS; R; in vacancy; many pB st. s; e diff.	16	27	36.5	+59	33	45	NGC 6170 = NGC 6176	L. Swift	GX	13.8	0.5′ × 0.5′	PGC 58188*

(continued)

Catalog 4 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S4–36	1886 Jul 6	16	30	0	+59	2	30	pF; pL; E; 2 st. nr. p.	16	31	40.9	+59	37	35	NGC 6191 = NGC 6189	L. Swift	GX	12.7	1.9′ × 0.9′	PGC 58440*
S4–37	1886 Jun 28	16	33	35	+57	44	5	vF; vS; R; forms right angle with 2 st. f.	16	35	30.7	+57	29	13	NGC 6198	L. Swift	GX	13.6	1.0′ × 0.7′	PGC 58554
S4–38	1886 Jul 9	16	34	50	+62	11	25	eeF; pS; * nr. f.	16	43	23.2	+61	59	2	NGC 6202 = NGC 6226	H. d'Arrest (1862)	GX	13.2	0.7′ × 0.4′	PGC 58847*
S4–39	1886 Aug 3	16	38	52	+66	15	25	eF; vS; R; forms a L equilatoral triangle with 2 pB st.	16	39	31.9	+66	2	22	NGC 6214	L. Swift	GX	13.5	1.0′ × 0.8′	PGC 58709
S4–40	1886 Jul 3	16	45	1	+4	49	29	eeeF; pS; R; bet. a distant B * f. and a distant F * p; ee diff.	16	50	46.7	+4	36	17	NGC 6230	L. Swift	GX	14.5	0.9′ × 0.7′	PGC 59106
S4–41	1886 Jun 28	16	45	55	+62	21	10	eeF; eS; eF * v close; e diff.; sp. of 2.	16	47	16.7	+62	8	49	NGC 6238	L. Swift	GX	13.8	0.5′ × 0.3′	PGC 58980

S4–42	1886 Jun 28	16	46	55	+62	24	40	vF; vS; R; bet. 2 st.; nf. of 2.	16	48	3.9	+62	12	2	NGC 6244	L. Swift	GX	13.5	1.6′ × 0.4′	PGC 59009
S4–43	1886 Jun 28	16	47	25	+55	44	32	vF; S; R.	16	49	52.7	+55	32	31	NGC 6246	L. Swift	GX	13.6	1.5′ × 0.6′	PGC 59077
S4–44	1886 Jun 28	16	50	50	+60	43	8	eF; vS; R; a B * and a D * nr. p.	16	52	29.8	+60	32	52	NGC 6258	L. Swift	GX	13.4	0.9′ × 0.7′	PGC 59165
S4–45	1886 Aug 5	16	50	55	+63	54	30	eF; pS; R; near sf. are 4 or 5 st. in form of a curve.	16	51	50.6	+63	42	52	NGC 6260	L. Swift	GX	13.8	0.8′ × 0.7′	PGC 59142
S4–46	1886 Aug 5	16	54	25	+63	25	16	eeeF; S; lE; eee diff.; nearly in center of a L vacancy.	16	55	33.2	+63	14	34	NGC 6275	L. Swift	GX	14.3	0.5′ × 0.3′	PGC 59262
S4–47	1886 Jun 9	17	1	55	+60	32	21	eF; S; cE; F * nr.	17	3	15.3	+60	20	16	NGC 6295	L. Swift	GX	15.0	1.1′ × 0.5′	PGC 59510
S4–48	1886 Aug 18	17	17	10	+60	44	5	vF; pS; eE; spindle, nearly bet. 2 p B distant st. nearer the p.	17	18	41.1	+60	36	29	NGC 6361	L. Swift	GX	13.1	2.2′ × 0.7′	PGC 60045
S4–49	1884 Aug 15	17	20	30	+62	16	15	eeeF; pL; iR; sev. eF st. involved; B * nr. sf.	17	22	43.6	+62	10	25	NGC 6365	L. Swift	GX	14.0	1.3′ × 1.1′	PGC 60171
S4–50	1886 Sep 1	17	23	40	+58	55	18	eeF; eS; R; e diff.; sf. of 2.	17	25	19.2	+58	49	2	NGC 6376	L. Swift	GX	15.5	0.6′ × 0.3′	PGC 60258

(continued)

Catalog 4 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S4–51	1886 Sep 1	17	23	45	+58	55	33	eF; eS; R; 1bM; in center of equilatoral triangle; np. of 2. Ver. both with 200.	17	25	23.0	+58	49	21	NGC 6377	L. Swift	GX	14.5	0.7′ × 0.3′	PGC 60264
S4–52	1886 Jul 22	17	26	4	+57	37	11	eF; S; R; B * nr. s; sp. of 2.	17	28	1.4	+57	31	19	NGC 6385	L. Swift	GX	13.1	1.3′ × 1.3′	PGC 60343
S4–53	1886 Jul 22	17	26	24	+57	38	11	eF; S; R; nf. of 2; this and the p. point to the B * ab. 8 mag.	17	28	23.9	+57	32	43	NGC 6387	L. Swift	GX	14.2	0.3′ × 0.2′	PGC 60355
S4–54	1886 Sep 1	17	26	55	+58	56	33	eF; vS; R; nearly bet. 2 st.	17	28	49.0	+58	51	3	NGC 6391	L. Swift	GX	14.0	0.7′ × 0.5′	PGC 60358
S4–55	1886 Jun 9	17	43	55	+67	38	4	eeF; S; R; v diff.; p of 2.	17	43	34.4	+67	36	13	NGC 6463	L. Swift	GX	14.1	0.6′ × 0.6′	PGC 60755
S4–56	1886 Jun 9	17	44	30	+67	39	14	eeeF; vS; R; ee diff.; f of 2.	17	44	14.8	+67	37	10	NGC 6470	L. Swift	GX	14.2	1.1′ × 0.7′	PGC 60778
S4–57	1886 Jul 22	17	45	0	+57	20	55	eeF; S; R; s of 2.	17	46	54	+57	18	34	NGC 6473	L. Swift				Missing
S4–58	1886 Jul 22	17	45	0	+57	21	10	eF; pS; R; 3 st. in a line nr. and 3 others in a line point to it; e diff.; n of 2.	17	47	5.5	+57	18	4	NGC 6474	L. Swift	GX	14.2	0.9′ × 0.5′	PGC 60850

S4–59	1886 Sep 1	17	47	58	+62	15	45	pF; pS; E; bet. a pair of st. and a trio of st. in form of a semi–circle.	17	49	20.9	+62	13	22	NGC 6488	L. Swift	GX	13.8	0.6′ × 0.5′	PGC 60918*
S4–60	1884 Jun 27	17	51	5	+65	34	12	eeF; vS; R; bet. 2 pairs of coarse D st.	17	51	7.4	+65	31	51	NGC 6505	L. Swift	GX	14.0	1.0′ × 0.9′	PGC 60995
S4–61	1886 May 30	17	53	0	+60	49	30	eeF; pS; lE; e diff.; in vacancy except one v F * nr.	17	54	39.3	+60	49	4	NGC 6510 = NGC 6511	L. Swift	GX	13.6	0.9′ × 0.6′	PGC 61086*
S4–62	1886 May 30	17	56	35	+73	25	31	eF; vS; lE; bet. 2 eF st.	17	54	16.6	+73	25	26	NGC 6538	L. Swift	GX	13.5	1.1′ × 0.6′	PGC 61072
S4–63	1886 Jun 28	17	56	45	+64	18	42	eeF; pS; R; in center of a semi–circle of 4 st.	17	57	19	+64	18	12	NGC 6534	L. Swift				Missing
S4–64	1886 Jun 6	17	56	45	+19	42	15	eeF; vS; R.	18	1	46.4	+19	43	44	NGC 6527	T. Safford (1866)	GX	13.4	1.4′ × 1.0′	PGC 61297
S4–65	1886 Jul 22	17	58	25	+61	22	5	eF; S; eE; coarse D * sp. points to it.	17	59	38.6	+61	21	34	NGC 6542	L. Swift	GX	13.3	1.3′ × 0.4′	PGC 61239
S4–66	1886 May 27	17	59	45	+66	35	25	vF; S; cE; H. 27 IV. [NGC 6543] in field.	18	0	7.3	+66	36	54	NGC 6552	H. d′Arrest (1866)	GX	13.6	1.0′ × 0.7′	PGC 61252

(continued)

Catalog 4 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S4–67	1884 Jul 24	18	8	0	+49	53	30	eeF; pS; R; in vacancy, bet. 6 st. like sickle in Leo, and 4 like [Alpha], [Beta], [Gamma] and [Delta] Ursae Majoris.	18	11	1.9	+49	54	43	NGC 6582	L. Swift	GX	14.3	0.8′ × 0.8′	PGC 61510
S4–68	1884 Jul 23	18	22	0	+66	33	26	eeeF; pS; R; forms triangle with 3 st.	18	22	2.9	+66	37	0	NGC 6636	L. Swift	GX	13.4	2.3′ × 0.4′	PGC 61782
S4–69	1884 Jun 18	18	25	40	+71	31	23	eeF; pS; lE; e diff.; bet. a F nr. *, and a distant B one.	18	24	19.7	+71	36	7	NGC 6651	L. Swift	GX	13.1	1.6′ × 0.7′	PGC 61836
S4–70	1886 Jul 31	18	30	55	+67	3	53	pB; pS; vE.	18	30	39.8	+67	59	13	NGC 6668 = NGC 6667 = NGC 6678	L. Swift	GX	12.7	2.3′ × 1.1′	PGC 61972*
S4–71	1886 Jul 31	18	32	5	+59	48	15	eeF; S; cE; e diff.; bet. a F and a pB * nearer the former.	18	33	37.3	+59	53	22	NGC 6670	L. Swift	GX	14.1	1.1′ × 0.6′	PGC 62033

S4–72	1886 May 30	18	33	0	+66	51	15	eeeF; pS; lE; 1bM; ee diff.; 2 or 3 others in field.	18	33	10.0	+66	57	32	NGC 6676	L. Swift	GX	14.4	1.6′ × 0.3′	PGC 62021
S4–73	1884 Aug 16	18	36	55	+55	30	12	vF; pL; R; pB * nr. s.	18	39	12.3	+55	38	30	NGC 6691	L. Swift	GX			PGC 62202
S4–74	1886 May 27	18	45	45	+66	35	55	eeeF; pS; ee diff.; sev. B st. nr. n.	18	46	50.0	+66	44	42	NGC 6714	L. Swift	AST		1′	four stars*
S4–75	1883 Aug 30	19	15	40	+63	44	35	eeeF; pL; R; ee diff.	19	16	41.2	+63	58	24	NGC 6789	L. Swift	GX	13.3	1.3′ × 1.0′	PGC 63000
S4–76	1886 Aug 5	19	25	0	+54	8	30	eF; pS; R; F * nr. s.	19	27	35.8	+54	22	22	NGC 6801	L. Swift	GX	13.9	1.3′ × 0.7′	PGC 63229
S4–77	1886 Sep 3	19	45	25	+59	37	0	eF; pS; R; pB * close s; p of 2.	19	47	7.6	+59	54	26	NGC 6829	L. Swift	GX	14.1	1.6′ × 0.4′	PGC 63667
S4–78	1886 Sep 3	19	46	10	+59	37	0	eF; S; R; f of 2.	19	47	57.3	+59	53	33	NGC 6831	L. Swift	GX	13.3	1.5′ × 1.4′	PGC 63674
S4–79	1886 Sep 6	19	59	55	+65	55	0	pB; pS; R; B M.	20	0	42.4	+66	13	39	NGC 6869	L. Swift	GX	12.0	1.5′ × 1.3′	PGC 63972*
S4–80	1886 Aug 31	21	20	40	+13	41	12	eeeF; eee diff.; close sf. of M of 3 F st. in a curve, M * the brighter. Neb. nearly on same parallel as the s * of 4 in a row p.	21	26	13.8	+14	10	59	NGC 7066	L. Swift	GX	13.8	1.0′ × 1.0′	PGC 66747*

(continued)

Catalog 4 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S4–81	1886 Jul 12	21	36	46	+12	3	31	eeF; S; R; pB * with distant companion close p; v diff.	21	42	22.9	+12	29	54	NGC 7112 = NGC 7113	A. Marth (1864)	GX	13.9	0.9′ × 0.9′	PGC 67208
S4–82	1886 Sep 1	22	9	55	+21	56	53	pF; S; R; mbM; 4 st. in form of a square nr. p.	22	15	20	+22	31	10	NGC 7238	L. Swift				Missing
S4–83	1886 Sep 1	22	16	30	−4	41	18	vF; pL; R; 4 st. nr. sf. point to it.	22	22	36.5	−4	7	15	NGC 7257 = NGC 7260	A. Marth (1864)	GX	12.9	2.0′ × 1.4′	PGC 68691*
S4–84	1886 Sep 1	22	26	30	+11	7	24	eF; S; R; in center of 4 F st. in form of a rhombus.	22	32	13.9	+11	42	44	NGC 7305	L. Swift	GX	14.0	0.25′	PGC 69091
S4–85	1886 Sep 2	22	38	0	+8	6	0	vF; S; R; 1bM.	22	43	49.3	+8	42	20	NGC 7362	L. Swift	GX	12.7	1.1′ × 0.8′	PGC 69602
S4–86	1886 Sep 2	22	40	45	+20	29	2	eF; v S; R; forms equilatoral triangle with 2 st. one the brighter.	22	46	32.1	+21	5	1	NGC 7375	T. Safford (1866)	GX	13.7	1.0′ × 0.7′	PGC 69695
S4–87	1886 Sep 2	22	49	5	+12	36	20	eeF; pS; R; e diff.; 8 or 10 st. in an irregular line p; s of 2.	22	55	3.1	+13	13	14	NGC 7413	L. Swift	GX	14.1	1.0′ × 0.7′	PGC 69997

S4–88	1886 Sep 2	22	49	5	+12	38	50	eeeF; S; R; eee diff.; n of 2.	22	55	24.4	+13	14	54	NGC 7414	L. Swift	GX	16.0	0.5′ × 0.2′	PGC 70008
S4–89	1886 Aug 3	23	1	25	+27	34	0	vF; S; R.	23	6	50.5	+28	10	45	NGC 7210 = NGC 7487	J. Herschel (1827)	GX	13.5	1.8′ × 1.7′	PGC 70496
S4–90	1886 Aug 8	23	4	35	+10	24	24	eF; vS; R.	23	10	29.8	+11	0	44	NGC 7500	L. Swift	GX	13.3	2.1′ × 1.1′	PGC 70620
S4–91	1886 Aug 8	23	6	30	+14	0	30	vF; S; R; bet. 2 st.	23	12	21.4	+14	36	34	NGC 7509	L. Swift	GX	13.7	1.1′ × 1.1′	PGC 70679
S4–92	1886 Sep 6	23	6	50	+13	6	22	eeF; S; R; 5 or 6 st. nf. in a line; e diff.	23	12	26.3	+13	43	35	NGC 7511	L. Swift	GX	13.9	1.1′ × 0.5′	PGC 70691
S4–93	1886 Sep 6	23	10	55	+10	16	45	vF; vS; R; 3 F st. sf. form a small right angle triangle.	23	16	44.5	+8	54	20	NGC 7569	L. Swift	GX	13.4	1.0′ × 0.7′	PGC 70914*
S4–94	1886 Aug 8	23	14	45	+26	41	13	pF; pS; cE; 3 st. in a line nr. p.	23	20	22.6	+27	18	56	NGC 7624	E. Stephan (1878)	GX	13.1	1.0′ × 0.7′	PGC 71126
S4–95	1884 Nov 9	23	15	15	+25	16	18	eF; pS; R.	23	20	54.9	+25	53	55	NGC 7628	E. Stephan (1878)	GX	12.7	1.1′ × 0.9′	PGC 71153
S4–96	1886 Sep 1	23	18	40	+13	20	36	eF; S; R; in vacancy.	23	24	26.0	+13	58	20	NGC 7651 = NGC 7644	L. Swift	GX	13.6	0.7′ × 0.5′	PGC 71353*
S4–97	1886 Sep 1	23	29	0	+15	26	15	vF; vS; R; 2 st. point to it.	23	34	46.9	+16	4	33	NGC 7703	J. Herschel (1825)	GX	13.4	2.2′ × 0.5′	PGC 71797
S4–98	1886 Aug 8	23	33	45	+26	21	0	eeF; pS; R; e diff.; p B * nr. f; [GC] 6218 [NGC 7728] nr. nf. but is not little but very elongated.	23	39	31	+26	59	13	NGC 7726	L. Swift				Missing

(continued)

S4–99	1886 Sep 7	23	39	20	−2	19	5	eF; pS; R; * nr. s, which with one f and p forms a double triangle.	23	45	20.0	−1	41	6	NGC 7746	L. Swift	GX	13.1	1.4′ × 1.1′	PGC 72319
S4–100	1886 Aug 9	23	46	28	+10	50	10	eF; S; R; in center of equilatoral triangle of 3 st.; D * near np.	23	52	10.7	+11	28	13	NGC 7774	L. Swift	GX	13.1	1.3′ × 1.2′	PGC 72679

Catalog 5 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S5–1	1886 Oct 21	0	9	5	−7	59	30	pB; pS; R; v mbM; 1st of 3.	0	14	44.6	−7	20	43	NGC 50	G. Ferrari (1865)	GX	11.6	2.3′ × 1.8′	PGC 983*
S5–2	1886 Oct 21	0	9	25	−7	45	14	vF; pS; R; 2nd of 3.	0	15	7.7	−7	6	24	NGC 54	W. Tempel (1886)	GX	13.8	1.2′ × 0.5′	PGC 1011
S5–3	1886 Oct 21	0	9	45	−7	48	30	vF; pS; R; wide D * nr. sp.; 3rd of 3.	0	14	30.7	−7	10	2	NGC 58 = NGC 47	W. Tempel (1886)	GX	13.0	2.0′ × 2.0′	PGC 967
S5–4	1886 Oct 21	0	11	55	−7	26	15	eeF; vS; R; in vacancy; e diff.	0	17	30.4	−6	49	29	NGC 64	L. Swift	GX	13.2	1.5′ × 1.1′	PGC 1149
S5–5	1886 Oct 21	0	12	52	−15	57	10	vF; S; R; vF D * close f.	0	18	39.0	−15	19	20	NGC 73	L. Swift	GX	12.7	1.7′ × 0.9′	PGC 1211
S5–6	1886 Oct 22	0	13	25	+5	49	26	vF; vS; R; triangle nr. np.	0	19	26.4	+6	26	57	NGC 75	L. Swift	GX	13.2	1.4′ × 1.4′	PGC 1255
S5–7	1886 Oct 31	0	19	15	+12	15	21	pF; pS; lE; inside of and near p. corner of equilatoral triangle.	0	25	16.8	+12	53	2	NGC 105	E. Stephan (1884)	GX	13.2	1.1′ × 0.7′	PGC 1583

(continued)

Catalog 5 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S5–8	1886 Oct 22	0	33	5	+6	25	41	vF; S; lE; 3 or 4 st. nr. sp.	0	38	54.7	+7	3	46	NGC 190	L. Swift	GX	14.1	1.0′ × 0.8′	PGC 2324
S5–9	1886 Oct 22	0	39	15	+5	28	55	vF; S; R; * nr. s.	0	45	1.9	+6	6	48	NGC 240	L. Swift	GX	13.5	1.0′ × 0.9′	PGC 2653
S5–10	1886 Oct 22	0	52	50	+6	29	40	vF; S; R; 5 or 6 st. nr. s. in a curve.	0	58	49.1	+7	6	41	NGC 332	L. Swift	GX	13.5	1.6′ × 1.4′	PGC 3511
S5–11	1886 Oct 22	1	8	16	+5	19	10	pF; vS; R; F * nr. np.	1	14	22.3	+5	55	37	NGC 437	L. Swift	GX	12.8	1.3′ × 1.0′	PGC 4464
S5–12	1886 Oct 21	1	8	35	−1	38	3	vF; S; R; B * nr. sf.; GC. 254 [NGC 450] nr.	1	14	38.6	−1	1	14	NGC 442	L. Swift	GX	13.4	1.0′ × 0.5′	PGC 4484
S5–13	1886 Oct 31	1	16	40	−1	28	17	eF; pL; R; lbM.	1	22	23.8	−0	52	31	NGC 497	E. Stephan (1882)	GX	13.0	2.1′ × 0.9′	PGC 4992*
S5–14	1886 Oct 22	1	33	40	+6	39	30	vF; pS; R.	1	39	37.9	+7	14	14	NGC 638	L. Swift	GX	13.8	0.8′ × 0.5′	PGC 6145
S5–15	1886 Oct 22	1	34	55	+7	23	50	eeeF; pS; R; ee diff.; lone * nf.	1	40	43.4	+7	58	59	NGC 652	L. Swift	GX	13.6	1.0′ × 0.6′	PGC 6208

S5–16	1886 Sep 25	1	42	55	+12	28	55	vF; S; R; 1bM; sp. of 2.	1	49	8.6	+13	3	35	NGC 675	L. Swift	GX	14.5	1.1′ × 0.5′	PGC 6665
S5–17	1886 Sep 25	1	43	0	+12	29	10	eeF; S; R; nf. of 2.	1	49	14.1	+13	3	19	NGC 677	L. Swift	GX	12.2	2.0′ × 2.0′	PGC 6673
S5–18	1886 Oct 2	1	52	45	−0	1	27	eF; pS; R; B * 30s f. 1′ s.	1	58	41.0	+0	31	45	NGC 768	L. Swift	GX	13.2	1.7′ × 0.8′	PGC 7465*
S5–19	1886 Nov 1	1	58	5	−10	28	50	eeF; S; R; pB * nr.; e diff.	2	3	31.2	−9	56	0	NGC 806	L. Swift	GX	14.0	1.3′ × 0.4′	PGC 7835
S5–20	1886 Nov 1	1	59	0	−9	16	45	vF; S; R.	2	4	19.0	−8	44	7	NGC 809	L. Swift	GX	13.8	1.5′ × 1.1′	PGC 7889
S5–21	1886 Nov 1	2	4	55	−10	51	55	eeeF; pL; e e diff.; * nr. nf.; 495–7–8–9 in field.	2	10	17.6	−10	19	16	NGC 848	O. Stone (1885)	GX	13.0	1.5′ × 1.0′	PGC 8299*
S5–22	1886 Oct 31	2	7	40	−1	14	30	eF; S; l E; F * close.	2	13	38.3	−0	43	2	NGC 856 = NGC 859	L. Swift	GX	13.2	1.3′ × 0.9′	PGC 8526*
S5–23	1886 Oct 3	2	8	0	−1	15	51	pF; pS; 1 b M; np. of 2.	2	13	38.3	−0	43	2	NGC 859 = NGC 856	L. Swift	GX	13.2	1.3′ × 0.9′	PGC 8526*
S5–24	1886 Oct 3	2	9	50	−1	18	6	pF; pS; R; lbM; sf. of 2.	2	14	33.6	−0	46	0	NGC 866 = NGC 863 = NGC 885	W. Herschel (1785)	GX	13.0	1.1′ × 1.0′	PGC 8586*
S5–25	1886 Oct 3	2	10	10	−1	14	51	eF; pS; R.	2	15	58.5	−0	42	49	NGC 868	L. Swift	GX	13.9	1.3′ × 1.0′	PGC 8659
S5–26	1886 Oct 7	2	11	12	+0	42	40	eF; vS; R.	2	17	4.8	+1	14	39	NGC 867 = NGC 875	W. Herschel (1783)	GX	12.9	1.1′ × 1.1′	PGC 8718

(continued)

Catalog 5 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S5–27	1886 Oct 31	2	13	55	−1	18	0	vF; vS; R; lbM.	2	14	33.6	−0	46	0	NGC 885 = NGC 863 = NGC 866	W. Herschel (1785)	GX	13.0	1.1′ × 1.0′	PGC 8586*
S5–28	1886 Oct 3	2	20	20	−0	51	6	vF; pS; R.	2	26	6.7	−0	19	55	NGC 926	W. Tempel (1876)	GX	13.3	1.8′ × 1.0′	PGC 9256*
S5–29	1886 Nov 1	2	23	25	−11	1	50	vF; pS; R; forms D neb. With [GC] 547 [NGC 945].	2	28	45.5	−10	30	50	NGC 948	O. Stone or L. Swift	GX	13.4	1.7′ × 1.3′	PGC 9431
S5–30	1886 Sep 29	2	31	50	−11	31	49	eeF; pS; R; 1 b M; 1st of 3.	2	37	34.9	−11	1	30	NGC 1006 = NGC 1010	E. Stephan (1876)	GX	14.4	0.9′ × 0.9′	PGC 9949*
S5–31	1886 Sep 29	2	31	55	−11	30	17	eeeF; vS; R; eee dif; 2nd of 3.	2	37	38.9	−11	0	20	NGC 1011	E. Stephan (1876)	GX	14.3	0.6′ × 0.6′	PGC 9955*
S5–32	1886 Sep 29	2	32	10	−12	0	50	eeF; vS; R; bet. 2 distant D st.	2	37	50.5	−11	30	26	NGC 1013	L. Swift	GX	13.5	0.9′ × 0.7′	PGC 9966
S5–33	1886 Sep 29	2	32	18	−11	29	19	eeeF; vS; R; eee diff.; 3rd of 3.	2	37	49.9	−11	0	37	NGC 1017	O. Stone (1886) or L. Swift	GX	13.9	0.7′ × 0.6′	PGC 9964*
S5–34	1886 Oct 2	2	34	8	+1	1	18	vF; pS; R; 1bM; np. of 2.	2	40	6.3	+1	30	31	NGC 1038	L. Swift	GX	13.4	1.2′ × 0.4′	PGC 10096*

S5–35	1886 Sep 29	2	34	8	−2	13	47	eeeF; vS; vE; eee diff.; [GC] 581 [NGC 1032] in field.	2	39	58	−1	44	2	NGC 1037	L. Swift				Missing
S5–36	1886 Oct 2	2	34	55	+0	50	20	eeeF; S; R; ee diff.; sf. of 2.	2	40	46.5	+1	20	35	NGC 1043	L. Swift	GX	15.0	0.8′ × 0.2′	PGC 10155
S5–37	1886 Oct 21	2	35	50	+41	0	35	vF; vS; lE; 4 st. in line s. point to it one close.	2	43	12.4	+41	30	2	NGC 1053 = NGC 1040	E. Stephan (1871)	GX	12.9	1.7′ × 0.8′	PGC 10298
S5–38	1886 Sep 29	2	36	35	−15	35	2	eeF; pS; * nr. s; B * p; e diff.	2	42	6.3	−15	5	29	NGC 1065	L. Swift	GX	13.5	0.8′ × 0.7′	PGC 10228
S5–39	1886 Sep 29	2	37	15	−8	46	42	eeF; pS; R; bet. 2 distant st.; B * nr. f.	2	42	59.8	−8	17	22	NGC 1069	L. Swift	GX	13.7	1.5′ × 1.0′	PGC 10285
S5–40	1886 Oct 21	2	39	30	−5	11	35	vF; pS; iR; forms triangle with 2 st.	2	45	9.9	−4	42	39	NGC 1080	L. Swift	GX	13.5	1.1′ × 0.8′	PGC 10416
S5–41	1886 Sep 29	2	39	35	−16	4	4	eF; pS; R.	2	45	5.5	−15	35	16	NGC 1081	L. Swift	GX	13.3	1.7′ × 0.6′	PGC 10411
S5–42	1886 Sep 29	2	40	0	−8	40	10	eeeF; pS; lE; nearly bet. 2 distant st.	2	45	41.2	−8	10	50	NGC 1082	L. Swift	GX	14.7	1.0′ × 0.7′	PGC 10447
S5–43	1886 Sep 29	2	40	10	−15	51	3	eeF; pS; vE; surrounded by 5 or 6 st.; np. of 2.	2	45	39.9	−15	21	29	NGC 1083	L. Swift	GX	13.8	1.7′ × 0.3′	PGC 10445
S5–44	1886 Sep 29	2	40	35	−15	33	2	eeF; S; R; sf. of 2.	2	46	10.1	−15	4	23	NGC 1089	L. Swift	GX	13.5	0.9′ × 0.7′	PGC 10481

(continued)

Catalog 5 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S5–45	1886 Oct 31	2	43	5	−8	25	27	eF; pS; R.	2	48	38.5	−7	57	4	NGC 1108	L. Swift	GX	15.1	0.7′ × 0.4′	PGC 10633
S5–46	1886 Nov 1	2	44	30	−12	38	23	eF; vS; vE.	2	49	58.7	−12	9	50	NGC 1118	L. Swift	GX	12.7	2.6′ × 0.8′	PGC 10748
S5–47	1886 Oct 31	2	46	25	−1	45	25	eeF; S; R; p. of [GC] 619 [NGC 1132].	2	52	18.6	−1	17	46	NGC 1126	L. Swift	GX	14.6	0.7′ × 0.2′	PGC 10868
S5–48	1886 Oct 8	2	46	32	+5	34	18	eF; S; 1E; 2 p F st. close p.	2	52	36.0	+6	2	40	NGC 1128	L. Swift	GX	12.7	0.9′ × 0.4′	PGC 11188/ 11189*
S5–49	1886 Oct 21	3	1	20	−9	59	15	F; pS; iR; 647 nr.; 1st of 2.	3	6	56.0	−9	32	39	NGC 1214	O. Stone (1886)	GX	14.0	1.3′ × 0.3′	PGC 11675*
S5–50	1886 Oct 21	3	1	30	−10	1	57	eF; vS; R; 647 nr.; 2nd of 2.	3	7	9.4	−9	35	33	NGC 1215	O. Stone (1886)	GX	14.1	1.5′ × 1.1′	PGC 11687*
S5–51	1886 Oct 21	3	5	25	+38	29	35	vF; S; 1E.	3	12	49	+38	55	39	NGC 1235	L. Swift				Missing
S5–52	1886 Nov 1	3	5	30	−11	10	43	vF; pS; R; sp. of [GC] 660 [NGC 1247].	3	10	52.7	−10	44	53	NGC 1238	L. Swift	GX	12.4	1.5′ × 1.2′	PGC 11868

S5–53	1886 Oct 21	3	7	50	+40	55	5	vF; vS; R.	3	15	21.1	+41	21	20	NGC 1250	L. Swift	GX	12.8	2.1′ × 0.9′	PGC 12098
S5–54	1886 Oct 21	3	29	20	−10	13	50	vF; S; R; forms triangle with 2 st. one vB.	3	34	49.6	−9	50	33	NGC 1363	S. Burnham (1877)	GX	13.1	0.8′ × 0.7′	PGC 13245*
S5–55	1886 Oct 31	3	37	30	−6	44	35	eeF; S; R; v diff.	3	42	40.1	−6	22	55	NGC 1423	L. Swift	GX	13.8	0.7′ × 0.5′	PGC 13628
S5–56	1886 Oct 22	3	40	20	−9	35	37	eF; pS; R; in vacancy.	3	45	36.6	−9	14	6	NGC 1450	O. Stone (1886)	GX	14.4	0.8′ × 0.6′	PGC 13775*
S5–57	1886 Nov 1	3	46	0	−15	43	55	pF; S; R; forms equilatoral triangle with 2 st.	3	51	24.5	−15	24	8	NGC 1464 = NGC 1471	F. Leavenworth (1886)	GX	13.8	0.7′ × 0.5′	PGC 13976*
S5–58	1886 Sep 25	3	46	25	+32	9	34	pF; pS; R; pB * nr. p.	3	53	31.9	+32	29	34	NGC 1465	L. Swift	GX	13.7	1.9′ × 0.5′	PGC 14039
S5–59	1886 Oct 22	3	58	40	−11	29	34	vF; vS; lE; F * nr. p.	4	3	55.2	−11	10	45	NGC 1509	O. Stone (1886) and L. Swift	GX	13.7	0.9′ × 0.6′	PGC 14393*
S5–60	1886 Oct 2	4	18	13	−1	1	10	eF; vS; R; nearly bet. 2 st.	4	24	25.4	−0	44	47	NGC 1568	L. Swift	GX	13.6	1.1′ × 0.8′	PGC 15034
S5–61	1886 Oct 22	4	25	30	−6	3	5	vF; pS.	4	30	51.6	−5	47	54	NGC 1594	L. Swift	GX	13.1	1.8′ × 1.3′	PGC 15348
S5–62	1886 Nov 1	4	42	52	−6	46	20	vF; pS; R; s of no. 26 of Stephan's Cat. In A. N. no. 2661.	4	48	32.8	−6	34	12	NGC 1666	L. Swift	GX	12.6	1.4′ × 1.1′	PGC 16057

(continued)

Catalog 5 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S5–63	1886 Oct 2	4	44	25	−0	58	10	pF; pS; R; pB * nr. sp.	4	50	16	−0	46	11	NGC 1671	L. Swift				Missing
S5–64	1886 Oct 22	4	45	40	−4	59	45	pF; pL; lE.	4	46	30.0	−4	47	19	NGC 1677 = NGC 1659	W. Herschel (1786)	GX	12.5	1.6′ × 1.1′	PGC 15977*
S5–65	1886 Oct 22	4	48	0	−6	31	20	pB; pS; lE.	4	48	37.2	−6	19	11	NGC 1689 = NGC 1667	E. Stephan (1884)	GX	12.1	1.8′ × 1.4′	PGC 16062*
S5–66	1886 Oct 9	4	54	20	−15	59	45	F; pS; lE; bet. 2 F st.	4	59	31.9	−15	49	25	NGC 1730	F. Leavenworth (1885)	GX	12.3	2.2′ × 1.0′	PGC 16499*
S5–67	1886 Oct 31	4	56	45	−3	30	57	eeeF; pS; R; ee diff.; s of 965.	5	2	32.4	−3	20	39	NGC 1753	L. Swift	GX	14.7	1.6′ × 1.0′	PGC 16610
S5–68	1886 Oct 24	7	48	10	+4	45	20	eF; S; eE; bet. 2 st.; 2 other st. p. form trap.	7	54	20.8	+4	27	35	NGC 2470	L. Swift	GX	12.7	1.9′ × 0.6′	PGC 22137
S5–69	1886 Oct 23	16	17	50	+56	56	0	eeeF; S; cE; ee diff.	16	20	17.1	+56	39	9	NGC 6133	L. Swift	AST			Three stars
S5–70	1883 Oct 1	16	25	52	+59	49	30	eF; eS; e diff.; in vacancy; 2 others and Comet 1884 I nr.	16	27	36.5	+59	33	45	NGC 6176 = NGC 6170	L. Swift	GX	13.8	0.5′ × 0.5′	PGC 58188*

S5–71	1886 Oct 23	16	37	50	+58	50	0	pF; eS; R; stellar; 3 vF st. nr. n. point to it.	16	40	7.9	+58	37	3	NGC 6206	L. Swift	GX	13.6	0.7′ × 0.7′	PGC 58723
S5–72	1886 Oct 23	16	51	30	+57	6	30	eeeF; pS; R; eee diff.	16	53	37	+56	55	22	NGC 6262	L. Swift				Missing
S5–73	1886 Oct 23	16	55	45	+47	25	0	vF; pS; lE; wide D * nr. nf.	16	59	1.5	+47	14	14	NGC 6279	L. Swift	GX	13.6	1.1′ × 1.0′	PGC 59370
S5–74	1884 Sep 25	17	39	52	+60	31	4	eeF; pS; lE; v close n of the s * of 3 in a line; v diff.	17	41	13.2	+60	26	59	NGC 6436	L. Swift	GX	14.0	1.5′ × 0.9′	PGC 60695
S5–75	1886 Oct 22	17	41	34	+48	10	30	eeF; pS; lE; e diff.	17	44	33.9	+48	6	51	NGC 6443	L. Swift	GX	13.8	1.2′ × 0.5′	PGC 60783
S5–76	1886 Sep 25	17	42	40	+67	39	25	eeeF; eS; R; ee diff.; bet. 2 st.; 1st of 6.	17	42	31.9	+67	35	32	NGC 6456	L. Swift	GX	14.6	0.6′ × 0.5′	PGC 60729*
S5–77	1884 Jul 18	17	43	0	+73	27	3	eF; pS; R; nr. terminal * of 5 forming semi–circle.	17	39	56.5	+74	2	3	NGC 6461	L. Swift	GX	14.5	1.0′ × 0.5′	PGC 60659*
S5–78	1886 Sep 25	17	44	30	+67	37	55	eeeF; eS; R; eee diff.; 4th of 6.	17	44	13.1	+67	35	35	NGC 6471	L. Swift	GX	14.4	1.3′ × 0.2′	PGC 60773*
S5–79	1886 Sep 25	17	44	30	+67	41	25	eeeF; eS; R; eee diff.; 5th of 6.	17	44	3.1	+67	37	49	NGC 6472	L. Swift	GX	15.0	0.6′ × 0.4′	PGC 2703230*
S5–80	1886 Sep 25	17	45	5	+67	40	40	eeeF; eS; R; ee diff.; 6th of 6.	17	44	30.1	+67	36	38	NGC 6477	L. Swift	GX			Missing*

(continued)

Catalog 5 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0									
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S5–81	1886 Sep 29	17	48	3	+62	15	50	eeF; S; R; bet. a * and little triangle.	17	49	20.9	+62	13	22	NGC 6488	L. Swift	GX	13.8	0.6′ × 0.5′	PGC 60918*
S5–82	1886 Oct 22	17	55	59	+45	55	0	pF; pS; lE.	17	59	14.7	+45	53	13	NGC 6524	L. Swift	GX	12.8	1.3′ × 1.0′	PGC 61221
S5–83	1886 Sep 19	17	56	50	+56	14	40	eeF; pS; R; e diff.; in a S vacancy; 3 F st. in line point to it. Edward	17	59	13.9	+56	13	54	NGC 6532	E. Swift	GX	13.9	1.8′ × 0.9′	PGC 61220
S5–84	1886 Oct 22	18	2	9	+46	53	0	eeF; pS; iR; 5 st. nr. sf. in a line, middle one D	18	5	14.0	+46	52	54	NGC 6560	L. Swift	GX	13.6	1.2′ × 0.8′	PGC 61381
S5–85	1886 Oct 31	18	35	40	+70	27	8	vF; pS; lE; nearly bet. 2 near st	18	34	50.2	+70	31	26	NGC 6690 = NGC 6689	H. d'Arrest (1863)	GX	12.5	3.8′ × 1.3′	PGC 62077*
S5–86	1884 Aug 16	18	36	8	+70	25	55	pF; L; R; bet. 2 st.	18	34	50.2	+70	31	26	NGC 6690 = NGC 6689	H. d'Arrest (1863)	GX	12.5	3.8′ × 1.3′	PGC 62077*
S5–87	1886 Oct 16	18	53	25	+52	13	56	pB; vS; R; F * p close n.	18	56	24.0	+52	22	39	NGC 6732	L. Swift	GX	13.3	0.9′ × 0.6′	PGC 62586

S5–88	1886 Oct 31	18	57	15	+72	38	38	eeeF; eee diff.; pB * nr. sf.; 3 v F coarse D st. in line nr. nf point to it.	18	55	21.8	+72	46	17	NGC 6747	L. Swift	GX	14.6	0.5′ × 0.4′	PGC 62564
S5–89	1886 Oct 16	19	3	58	+50	10	25	vF; S; R; vF D * close sp.	19	6	57.1	+50	20	53	NGC 6759	A. Voigt (1865)	GX	14.1	1.0′ × 0.7′	PGC 62779
S5–90	1886 Oct 3	19	13	10	+73	13	15	eeF; S; R; sp. of and near 2 st.	19	10	53.9	+73	24	36	NGC 6786	L. Swift	GX	12.8	1.1′ × 0.9′	PGC 62864
S5–91	1886 Sep 20	20	33	30	+64	24	44	eF; pS; iR.	20	35	6.9	+64	48	10	NGC 6949	L. Swift	GX	13.5	1.4′ × 1.2′	PGC 65010
S5–92	1886 Aug 31	21	20	40	+13	41	12	eeeF; eee diff.; close sf. of middle of 3 F st. in a curve, middle * the b.	21	26	13.8	+14	10	59	NGC 7066	L. Swift	GX	13.8	1.0′ × 1.0′	PGC 66747*
S5–93	1886 Oct 2	22	1	20	+9	40	37	vF; pS; lE.	22	7	2.0	+10	14	0	NGC 7212	L. Swift	GX	13.8	1.2′ × 0.6′	PGC 68065
S5–94	1886 Sep 25	23	5	10	+13	0	30	eeeF; e S; lE; nearly bet. a B * and a v wide D *.	23	11	0.7	+13	37	54	NGC 7505	L. Swift	GX	14.7	0.7′ × 0.2′	PGC 70636
S5–95	1886 Sep 25	23	6	40	+13	6	30	eF; S; R; vF * nr. s; 5 st. in a line nr. n.	23	12	26.3	+13	43	35	NGC 7511	L. Swift	GX	13.9	1.1′ × 0.5′	PGC 70691*
S5–96	1886 Sep 29	23	7	0	+12	13	49	pB; pS; R; D * points to it.	23	12	48.6	+12	40	45	NGC 7515	W. Herschel (1784)	GX	12.4	1.7′ × 1.6′	PGC 70699

(continued)

Catalog 5 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S5–97	1886 Sep 29	23	8	30	+12	57	52	eeeF; pS; R; ee diff.; bet. a F nr. * and a B * f; n of 2.	23	14	12.6	+13	34	54	NGC 7535	L. Swift	GX	13.7	1.7′ × 1.7′	PGC 70761
S5–98	1886 Sep 29	23	8	30	+12	48	52	eeF; pS; R; curiously placed in a ring of 6 st. np. of center; s of 2.	23	14	13.1	+13	25	35	NGC 7536	L. Swift	GX	13.4	1.9′ × 0.7′	PGC 70765
S5–99	1886 Sep 25	23	11	50	+13	22	30	vF; pS; R; F * nr. sp.; 3 st. f. point to it.	23	17	36.4	+14	0	3	NGC 7580	L. Swift	GX	13.7	0.8′ × 0.6′	PGC 70962
S5–100	1886 Sep 29	23	17	25	+13	20	53	vF; pS; lE.	23	24	26.0	+13	58	20	NGC 7644 = NGC 7651	L. Swift	GX	13.6	0.7′ × 0.5′	PGC 71353*

Catalog 6 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S6–1	1886 Nov 21	0	5	10	−12	44	50	pF; S; R; equilatoral triangle with 2 st. one a close D = 2.5″; sp. of 2. The D * is probably new.	0	11	6.6	−12	6	28	NGC 34 = NGC 17	L. Swift and F. Muller (1886)	GX	13.0	2.3′ × 0.9′	PGC 781*
S6–2	1886 Nov 21	0	5	20	−12	38	50	eeF; pS; R; nearly bet. 2 distant st.; nf. of 2.	0	11	10.5	−12	1	15	NGC 35	L. Swift and F. Muller (1886)	GX	12.5	0.8′ × 0.5′	PGC 784*
S6–3	1886 Nov 20	0	28	5	−28	26	50	pF; pS; R.	0	34	15.5	−27	48	13	NGC 150	L. Swift	GX	11.4	3.9′ × 1.9′	PGC 2052
S6–4	1886 Nov 21	0	30	0	−3	27	56	eF; eS; R; nearly bet. 2 = mag. st.	0	35	33.9	−2	50	56	NGC 161	L. Swift	GX	13.2	1.3′ × 0.7′	PGC 2131
S6–5	1886 Nov 21	0	36	25	+0	12	41	vF; S; R; bet. 2 st.	0	42	15.9	+0	50	43	NGC 223 = IC 44	G. Bond (1853)	GX	13.2	1.3′ × 0.9′	PGC 2527*

(continued)

Catalog 6 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S6–6	1886 Nov 21	0	37	50	−0	45	21	vF; pS; lE.	0	43	27.9	−0	7	30	NGC 237	T. Safford (1867)	GX	13.0	1.6′ × 0.9′	PGC 2597
S6–7	1886 Nov 20	1	15	15	−9	48	44	vF; vS; R; F * nr. np.	1	21	12.5	−9	12	40	NGC 481	L. Swift or F. Leavenworth (1886)	GX	13.7	1.7′ × 1.2′	PGC 4899
S6–8	1886 Nov 20	1	18	30	−2	15	51	eeF; vS; R; e diff.	1	24	28.6	−1	38	28	NGC 519	L. Swift	GX	14.3	0.5′ × 0.3′	PGC 5182
S6–9	1886 Nov 20	1	19	5	−2	11	36	eF; S; eE; F * nr. sf.	1	24	41.6	−1	35	13	NGC 530	L. Swift	GX	13.0	1.5′ × 0.4′	PGC 5210
S6–10	1886 Nov 20	1	19	45	−2	8	33	eF; S; vE; pF * close n; Not [GC] 5180 [NGC 558].	1	25	26.0	−1	33	2	NGC 538	L. Swift	GX	13.7	1.0′ × 0.5′	PGC 5275
S6–11	1886 Nov 20	1	21	20	−2	14	4	eF; S; B * f. 15 s and is n of it.	1	26	25.2	−1	38	20	NGC 557	L. Swift	GX	13.5	1.4′ × 0.8′	PGC 5351
S6–12	1886 Nov 20	1	25	15	−2	35	40	pF; pS; R.	1	30	40.7	−1	59	40	NGC 580 = NGC 577	A. N. Skinner (1867)	GX	12.9	1.8′ × 1.4′	PGC 5628
S6–13	1886 Dec 20	3	25	15	+3	58	20	eeF; S; R; bet. 2 st.	3	31	27.5	+4	22	51	NGC 1349	L. Swift	GX	13.0	0.7′ × 0.7′	PGC 13088

S6–14	1887 Feb 13	3	33	13	−37	34	36	pB; L; R; 1 b M; cometic. See Note.	3	37	32	−37	11	56	comet?	L. Swift				Missing*
S6–15	1887 Feb 13	3	33	13	−37	30	±	vF; pS; R.	3	37	32	−37	7	±	NGC 1392	L. Swift				Missing*
S6–16	1886 Dec 20	4	26	10	−5	36	34	eF; S; R; bet. 2 st. one a wide double.	4	31	58.6	−5	22	11	NGC 1604	L. Swift	GX	13.5	1.1′ × 0.8′	PGC 15433
S6–17	1886 Dec 22	4	30	30	−5	4	5	eeF; S; R.	4	36	11	−4	49	54	NGC 1619	L. Swift				Missing
S6–18	1886 Dec 22	4	30	45	−5	12	50	eF; S; R.	4	36	25.1	−4	59	14	NGC 1621	F. Leavenworth (1886) and L. Swift	GX	13.5	1.3′ × 0.8′	PGC 15626*
S6–19	1886 Dec 22	4	31	52	−5	6	20	eF; pL; R; triangle with 2 st. sf.; v diff.; s of 2.	4	37	38.0	−4	53	15	NGC 1627	L. Swift	GX	12.9	1.6′ × 1.5′	PGC 15675
S6–20	1886 Dec 22	4	31	55	−4	56	20	vF; pS; vE in meridian; n of 2.	4	37	36.3	−4	42	53	NGC 1628	L. Swift	GX	14.0	1.8′ × 0.4′	PGC 15674
S6–21	1886 Dec 22	4	51	15	−4	56	20	eeeF; pS; R; bet. 2 st.; [GC] 932 [NGC 1700] near.	4	56	59.6	−4	45	25	NGC 1699	S. Hunter (1860)	GX	12.9	0.9′ × 0.6′	PGC 16390
S6–22	1886 Nov 20	4	54	15	−3	31	13	eeeF; pS; R; pF * nr. f; ee diff.; [GC] 965 [NGC 1740] in field.	5	0	15.7	−3	21	9	NGC 1729	W. Herschel (1786)	GX	12.3	1.9′ × 1.4′	PGC 16529

(continued)

Catalog 6 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S6–23	1887 Feb 13	5	2	15	−8	10	22	eeF; S; R; F * v nr. np.; sp. of 2.	5	7	44.9	−8	1	7	NGC 1797	L. Swift	GX	14.7	1.3′ × 0.9′	PGC 16781
S6–24	1887 Feb 13	5	2	20	−8	7	22	eF; vS; lE; nf. of 2;?; a few e F st.	5	7	44.6	−7	58	10	NGC 1799	L. Swift	GX	13.9	1.1′ × 0.6′	PGC 16783
S6–25	1886 Dec 27	5	54	40	+58	7	30	vF; vS; vlE. Edward.	6	4	34.2	+57	37	40	NGC 2128	E. Swift	GX	12.6	1.5′ × 1.1′	PGC 18374*
S6–26	1886 Nov 24	6	13	20	+51	59	8	pF, pS, lE.	6	22	34.6	+51	54	35	NGC 2208	L. Swift	GX	12.8	1.7′ × 1.0′	PGC 18911
S6–27	1886 Nov 24	6	25	45	+44	52	35	eeF; vS; R; F * nr. nf.	6	34	7.4	+44	46	38	NGC 2242	L. Swift	PN	15.2	20″	PN G170.3 + 15.8
S6–28	1887 Mar 11	6	44	10	−16	47	31	vF; vS; R; in finder field with Dog star.	6	48	39.1	−16	54	6	NGC 2296	L. Swift	RN		1.2′ × 1.0′	PGC 19643
S6–29	1886 Nov 24	6	47	40	+45	39	35	eF; vS; R; sev. st. nr.	6	56	17.5	+45	29	34	NGC 2303	L. Swift	GX	12.6	1.5′ × 1.5′	PGC 19891
S6–30	1886 Nov 24	7	3	40	+47	22	35	pB; pS; R.	7	12	28.7	+47	10	0	NGC 2344	L. Swift	GX	12.1	1.7′ × 1.6′	PGC 20395

S6–31	1887 Mar 23	8	13	25	+5	1	0	vF; S; R; right angled with 2 st.	8	19	37.0	+4	39	26	NGC 2561	L. Swift	GX	13.1	1.1′ × 0.6′	PGC 23351
S6–32	1887 Feb 13	8	18	55	−8	23	48	pF; pS; lE in meridian.	8	24	30	−8	46	4	NGC 2589	L. Swift				Missing
S6–33	1886 Nov 24	8	43	43	+48	0	7	eeF; pS; R; trap. of 4 p B st. nr. nf.	8	51	35.6	+47	33	28	NGC 2676	L. Swift	GX	13.1	1.2′ × 1.1′	PGC 24881
S6–34	1887 Mar 26	9	2	30	+76	51	10	vF; pS; R; nearly bet. an 8 and 9 mag. star.	9	15	42	+76	22	57	NGC 2760	L. Swift				Missing
S6–35	1887 Mar 26	9	11	35	−4	15	12	vF; pS; R.	9	17	10.5	−4	45	8	NGC 2817	L. Swift	GX	12.6	2.0′ × 1.8′	PGC 26223
S6–36	1887 Apr 16	10	29	19	−5	33	32	vF; vS; lE.	10	35	34.4	−6	10	47	NGC 3292	L. Swift	GX	14.1	1.1′ × 0.9′	PGC 31370
S6–37	1887 Mar 23	10	45	25	+19	5	42	pF; S; R; coarse D * nr. n.	10	51	41.7	+18	28	52	NGC 3426	L. Swift	GX	13.1	1.1′ × 0.8′	PGC 32577
S6–38	1887 Apr 24	10	46	44	+18	2	45	eeF; vS; R.	10	53	0.1	+17	34	25	NGC 3443	L. Swift	GX	13.1	2.8′ × 1.4′	PGC 32671
S6–39	1887 Apr 24	10	52	10	+17	42	44	vF; pS; R; [GC] 2267 [NGC 3473] nr. n.	10	58	8.8	+17	5	44	NGC 3474	L. Swift	GX	13.9	0.8′ × 0.7′	PGC 32989
S6–40	1887 Mar 23	11	14	30	+4	12	47	vF; S; R; nearly bet. a pB and a F *.	11	20	26.2	+3	35	8	NGC 3633	L. Swift	GX	13.6	1.2′ × 0.4′	PGC 34711

(continued)

Catalog 6 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S6–41	1887 Mar 30	11	56	5	+18	27	48	eF; pS; R; forms nearly a square with 3 st. If this is 2677, GC. is wrong in both coordinates.	12	2	5.4	+17	49	23	NGC 4040	L. Swift	GX	13.3	1.9′ × 1.3′	PGC 37993
S6–42	1887 Apr 17	12	18	15	+12	51	10	eeF; pL; in vacancy; v diff.	12	24	1.6	+12	12	18	NGC 4354 = NGC 4351	H. d'Arrest (1863)	GX	12.6	2.0′ × 1.3′	PGC 40306
S6–43	1887 Apr 17	12	22	28	+14	33	58	eeF; pS; R; ee diff.; D; triplicity suspected; 2 = mag. st. range with it n and s; [GC] 3012 [NGC 4459] in field f.	12	28	6.8	+13	54	42	NGC 4446	L. Swift	GX	13.9	1.1′ × 0.8′	PGC 40962
S6–44	1887 Apr 17	12	22	30	+14	33	58	eeF; pS; R; ee diff.	12	28	12.6	+13	53	57	NGC 4447	L. Swift	GX	14.1	0.9′ × 0.7′	PGC 40979
S6–45	1887 Apr 27	12	29	30	+3	40	27	eF; S; R; bet. 2 st. Edward.	12	35	36.6	+3	2	4	NGC 4544	E. Swift	GX	13.3	2.0′ × 0.6′	PGC 41958

S6–46	1887 Apr 27	12	36	40	+15	0	15	eeF; pS; R; F * close p; [GC] 3167 [NGC 4634] nr. p. Edward.	12	42	37.4	+14	21	26	NGC 4633	E. Swift	GX	13.2	2.0′ × 0.8′	PGC 42699
S6–47	1887 Apr 17	12	37	10	+12	54	30	eF; pL; lE; * nr. p; np. of 2.	12	42	57.8	+12	17	12	NGC 4640	L. Swift	GX	13.5	1.4′ × 0.8′	PGC 42753
S6–48	1887 Apr 17	12	37	15	+12	41	30	eF; pL; R; F * nr. f; sf. of 2.	12	43	7.7	+12	3	4	NGC 4641	L. Swift	GX	13.2	1.2′ × 0.9′	PGC 42769
S6–49	1887 Apr 27	12	45	45	−13	41	50	pF; pS; R; mbM.	12	51	32.4	−14	13	16	NGC 4740 = IC 3834	L. Swift	GX	13.6	0.8′ × 0.4′	PGC 43559
S6–50	1887 Apr 17	12	57	45	+15	1	20	vF; vS; R; 3 st. like belt of Orion nf.	13	3	21.2	+14	22	39	NGC 4935	L. Swift	GX	13.0	1.2′ × 1.1′	PGC 45093
S6–51	1887 Mar 25	12	58	55	−7	19	41	eeF; pS; lE; [GC] 3397 [NGC 4958] f 54 s.	13	4	56.0	−7	56	52	NGC 4948	L. Swift	GX	14.4	2.3′ × 0.8′	PGC 45224
S6–52	1887 Apr 27	13	0	55	+14	15	19	eeeF; S; R; ee diff. Edward.	13	7	2.8	+13	38	14	NGC 4969	E. Swift	GX	13.9	0.7′ × 0.4′	PGC 45425
S6–53	1887 Apr 24	13	15	50	−12	7	38	vF; pS; R	13	21	55	−12	43	48	IC 884	L. Swift				Missing*
S6–54	1887 Mar 25	13	17	30	+14	33	28	eeeF; S; R; * nr. f; more dis. D * f 24 s; ee diff.	13	23	0.4	+13	57	2	NGC 5115	L. Swift	GX	13.7	1.6′ × 0.7′	PGC 46754

(continued)

Catalog 6 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S6–55	1887 Apr 24	13	18	7	−11	51	35	vF; vS; nearly bet. 2 st.; [GC] 3517 [NGC 5119] nr. np.	13	24	12	−12	27	37	IC 887	L. Swift				Missing*
S6–56	1887 Apr 24	13	18	15	−10	2	30	vF; S; R; in finder field with Alpha Virginis	13	24	14.9	−10	39	16	NGC 5122	L. Swift	GX	13.4	0.9′ × 0.3′	PGC 46848
S6–57	1887 Apr 17	13	19	30	+14	41	17	eeeF; pL; ee diff.; [GC] 5737 [NGC 5132] p; [GC] 3526 [NGC 5129] sp.	13	24	52.5	+14	4	38	NGC 5137	L. Swift	GX	15.1	0.7′ × 0.5′	PGC 46907
S6–58	1887 Apr 19	13	22	35	+11	37	10	vF; pL; eE; an eeF * at each focus of ellipse; B * in field sp.; F * nr. nf.	13	29	26.0	+11	0	29	NGC 5162 = NGC 5174	W. Herschel (1784)	GX	12.6	3.4′ × 1.9′	PGC 47346
S6–59	1887 May 18	13	26	5	+63	4	14	vF; pS; R; bet. 2 vF st.	13	30	3.7	+62	30	42	NGC 5205	L. Swift	GX	12.3	3.2′ × 1.8′	PGC 47425

S6–60	1887 Apr 27	13	43	43	−15	11	57	vF; pS; R; bet. a * and a course D * f. Edward	13	49	56	−15	46	16	NGC 5309	E. Swift				Missing
S6–61	1887 Mar 25	13	46	30	−27	54	24	eeF; S; R; e diff.; nf. of [GC] 3676 [NGC 5328]	13	52	59.2	−28	28	14	NGC 5330	L. Swift	GX	13.8	0.6′ × 0.5′	PGC 49316
S6–62	1887 Mar 23	13	46	40	+17	32	37	vF; S; R.	13	52	7.9	+16	58	12	NGC 5332	L. Swift	GX	12.9	1.0′ × 0.9′	PGC 49243
S6–63	1887 May 18	13	54	50	+65	27	11	vF; pS; IR; B * sp.; = 5413	13	57	53.5	+64	54	39	NGC 5413	J. Herschel (1832)	GX	13.2	1.2′ × 1.0′	PGC 49677*
S6–64	1887 Mar 23	13	59	30	+13	41	10	pF; S; lE; pB * nr. sp.	14	5	0.2	+13	7	55	NGC 5459	L. Swift	GX	13.1	1.1′ × 1.0′	PGC 50215
S6–65	1887 Mar 23	14	10	45	+8	49	50	e e F; p S; R; v F * close; triple * in field p.	14	16	19.9	+8	17	36	NGC 5528	L. Swift	GX	13.9	0.9′ × 0.4′	PGC 50981
S6–66	1887 May 9	14	22	25	+52	6	29	eF; S; lE; Theta Bootis in field.	14	26	35.6	+51	35	10	NGC 5624	L. Swift	GX	13.1	1.1′ × 0.7′	PGC 51568
S6–67	1887 Apr 19	14	25	10	+6	29	53	vF; pS; R.	14	31	1.1	+5	58	42	NGC 5650 = NGC 5652	W. Herschel (1793)	GX	12.5	2.1′ × 1.5′	PGC 51865
S6–68	1887 Apr 19	14	37	40	+11	42	50	eeF; S; lE; v diff.	14	43	30.8	+11	12	10	NGC 5736	L. Swift	GX	13.8	1.0′ × 0.6′	PGC 52597

(continued)

Catalog 6 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S6–69	1887 Mar 30	14	49	30	+29	25	19	vF; S; R; pB * nr. sp.	14	54	22.7	+28	56	23	NGC 5780	L. Swift	GX	13.9	0.9′ × 0.4′	PGC 53275
S6–70	1887 Apr 19	14	50	5	+12	10	23	eF; vS; E; * nr. sf.	14	55	55.2	+11	51	41	NGC 5782	L. Swift	GX	13.6	0.8′ × 0.8′	PGC 53379*
S6–71	1887 Apr 21	14	50	20	+52	35	16	vF; pS; F * close f; np. of 2.	14	53	28.3	+52	4	34	NGC 5785 = NGC 5783	L. Swift	GX	12.8	2.9′ × 1.8′	PGC 53217
S6–72	1887 Apr 21	14	50	50	+52	33	16	eeeF; S; R; ee diff.; sf. of 2.	14	53	16.9	+52	2	39	NGC 5788	L. Swift	GX	14.6	0.5′ × 0.4′	PGC 53189
S6–73	1887 Apr 23	14	55	10	+50	18	30	vF; pS; R; bet. 2 st.; an eF * involved.	14	58	58.4	+49	49	17	NGC 5818	L. Swift	GX	13.7	1.2′ × 0.9′	PGC 53530
S6–74	1887 Apr 23	14	57	50	+48	21	57	vF; S; R; B * nr. f.	15	1	50.9	+47	52	32	NGC 5830	L. Swift	GX	14.2	1.0′ × 0.7′	PGC 53674
S6–75	1887 Apr 23	14	58	40	+49	21	37	vF; pS; R.	15	2	25.4	+48	52	39	NGC 5835	L. Swift	GX	14.4	1.1′ × 0.9′	PGC 53699
S6–76	1887 Mar 30	15	2	0	+4	25	46	eF; S; R; 2 pB st. nr. f.	15	7	49.0	+3	59	3	NGC 5855	L. Swift	GX	14.4	0.6′ × 0.6′	PGC 54014

S6–77	1887 Mar 30	15	15	50	+8	7	43	eeF; pS; lE; wide D * nr. s; e diff.; np. of 2.	15	21	36.9	+7	43	10	NGC 5919	L. Swift	GX	15.5	0.3′ × 0.3′	PGC 54826
S6–78	1887 Mar 30	15	16	12	+8	7	13	eeF; pS; lE; ee diff.; sf. of 2.	15	21	51.9	+7	42	32	NGC 5920	L. Swift	GX	13.6	1.1′ × 0.9′	PGC 54839
S6–79	1887 Apr 21	15	23	20	+49	3	30	vF; pS; R; np. of 2.	15	26	48.2	+48	36	53	NGC 5932	L. Swift	GX	14.1	0.8′ × 0.8′	PGC 55109
S6–80	1887 Apr 21	15	23	30	+49	2	31	eeeF; vS; R; sf. of 2.	15	27	1.5	+48	36	47	NGC 5933	L. Swift	GX	14.7	0.5′ × 0.2′	PGC 55117
S6–81	1887 Apr 19	15	23	49	+7	57	45	eF; pL; R.	15	29	29.6	+7	34	24	NGC 5931	L. Swift	GX	14.0	1.0′ × 0.5′	PGC 55233
S6–82	1887 Apr 19	15	25	41	+7	52	30	eF; pS; R; 1st of 4.	15	31	18.1	+7	27	28	NGC 5940	L. Swift	GX	13.4	0.8′ × 0.8′	PGC 55295
S6–83	1887 Apr 19	15	25	50	+7	45	30	eeeF; S; R; ee diff. 2nd of 4.	15	31	36.8	+7	18	45	NGC 5941	L. Swift	GX	13.9	0.7′ × 0.6′	PGC 55309
S6–84	1887 Apr 19	15	25	55	+7	42	30	eeeF; S; R; eee diff. 3rd of 4.	15	31	42.2	+7	17	15	NGC 5942	L. Swift	GX	14.4	0.5′ × 0.5′	PGC 55316
S6–85	1887 Apr 19	15	26	5	+7	43	0	eeeF; S; R; eee diff. 4th of 4.	15	31	47.6	+7	18	30	NGC 5944	L. Swift	GX	15.0	0.6′ × 0.2′	PGC 55321
S6–86	1887 Apr 17	15	38	53	+10	41	0	eeF; pS; R; F * nr. n; D * sf.	15	44	33.8	+10	17	36	NGC 5988	L. Swift	GX	13.8	1.2′ × 1.0′	PGC 55921

(continued)

Catalog 6 (Warner observatory)

				Equinox 1885.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S6–87	1887 Mar 30	16	7	5	+2	28	31	pB; pS; R; mbM.	16	12	58.4	+2	10	37	NGC 6080	L. Swift	GX	13.5	1.2′ × 1.0′	PGC 57509
S6–88	1887 Apr 3	16	10	20	+19	44	55	eF; vS; R; B * f 41 s and is n of it, F * f 16 s; np. Of 2.	16	15	34.1	+19	27	42	NGC 6098	T. Safford (1867)	GX	12.9	1.3′ × 1.3′	PGC 57634
S6–89	1887 Apr 3	16	10	25	+19	44	45	eF; vS; R; forms D neb. with above.	16	15	35.5	+19	27	12	NGC 6099	T. Safford (1867)	GX	12.4	1.1′ × 1.1′	PGC 57640
S6–90	1887 Apr 3	16	22	15	+19	50	43	vF; pS; R; pB * nr. s.	16	27	24.3	+19	35	50	NGC 6149	L. Swift	GX	13.5	1.1′× 0.8′	PGC 58183
S6–91	1887 May 13	17	13	30	+57	30	43	eeeF; vS; R; eee diff.; middle of 3, one being [GC] 4291 [NGC 6338]	17	15	24.3	+57	21	2	NGC 6345	L. Swift	GX	14.3	0.8′× 0.2′	PGC 59945
S6–92	1887 May 2	17	14	15	+52	45	20	eF; S; R; D * nr. np.	17	18	53.1	+52	36	55	NGC 6358	L. Swift	GX	14.1	0.9′ × 0.4′	PGC 60054*
S6–93	1887 May 2	17	33	50	+60	53	23	eeF; S; R; nearly bet. 2 st.; [GC] 4320 [NGC 6411] nr. nf.	17	35	10	+60	49	7	NGC 6410	L. Swift				Missing

S6–94	1886 Nov 14	21	51	0	+13	1	1	eeF; eS; R; pF * with v F distant com. 5″ s.	21	56	25.6	+13	33	46	NGC 7159	L. Swift	GX	14.3	0.6′ × 0.5′	PGC 67674
S6–95	1886 Nov 18	23	15	5	+11	25	28	vF; S; vE; coarse D * nr. n; the D * is bet. 2 st.	23	22	30.9	+11	53	33	NGC 7627 = NGC 7641	E. Stephan (1873)	GX	13.9	1.7′ × 0.5′	PGC 71241
S6–96	1886 Sep 25	23	18	30	+14	1	0	vF; pL; R.	23	24	20.1	+14	38	49	NGC 7649	L. Swift	GX	14.0	1.3′ × 0.9′	PGC 71343
S6–97	1886 Oct 21	23	29	40	−17	20	30	pF; S; R; bet. 2 distant B st.	23	35	27.5	−16	42	18	NGC 7709	L. Swift	GX	12.7	2.6′ × 0.8′	PGC 71828
S6–98	1886 Aug 05	23	55	15	+12	29	6	pF; pS; R; F * v nr. np.; near and bet. The 2 p of 3 st. in a line; np. of 2	0	1	20.0	+13	6	41	NGC 7803	L. Swift	GX	13.1	1.0′ × 0.6′	PGC 101
S6–99	1886 Aug 05	23	56	10	+12	20	26	pF; pS; R; 2 F st. v nr. and in line with it; sf. of 2.	0	2	19.2	+12	58	18	NGC 7810	W. Herschel (1784)	GX	13.0	1.2′ × 0.9′	PGC 163
S6–100	1886 Oct 23	23	58	10	+6	46	30	eeeF; pS; ee diff.; f [GC] 5048 [NGC 7816] 22 s and is 5′ s.	0	4	8.8	+7	22	46	NGC 7818	L. Swift	GX	14.0	1.1′ × 1.1′	PGC 288

Catalog 7 (Warner observatory)

				Equinox 1890.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S7–1	1887 Oct 8	0	14	20	+58	42	1	F * involved in vL eeeF nebulosity eee diff. in line with 2 st. of = mag. Which with a 3rd forms a right angled triangle.	0	20	23.2	+59	17	35	IC 10	L. Swift	GX	10.4	6.3′ × 5.1′	PGC 1305
S7–2	1887 Oct 18	1	3	35	−2	16	6	eF; S; lE; * close nf.	1	9	22.2	−1	41	45	IC 81	L. Swift	GX	13.8	1.1′ × 0.9′	PGC 4127
S7–3	1887 Oct 12	1	56	50	+10	32	46	eF; pS; lE or iR; B * sf; pF * nr. f	2	2	31.0	+11	5	35	IC 193	L. Swift	GX	13.4	1.5′ × 1.3′	PGC 7765
S7–4	1887 Oct 15	2	25	25	+0	46	45	vF; S; R.	2	31	11.6	+1	15	57	IC 232	L. Swift	GX	12.7	1.4′ × 0.8′	PGC 9588
S7–5	1887 Oct 12	2	29	15	+12	21	0	vF; vS; R; mbM.	2	35	22.7	+12	50	16	IC 238	L. Swift	GX	12.8	1.4′ × 0.8′	PGC 9835
S7–6	1887 Oct 15	2	34	24	+2	0	45	eeF; vS; R; triangle with 2 st. eee diff.	2	40	28.6	+2	28	43	IC 246	L. Swift	GX	14.3	0.7′ × 0.6′	PGC 10116

S7–7	1887 Nov 8	2	48	25	+12	22	26	eeF; pS; E; sf. of GC. 620 [NGC 1134].	2	53	50.2	+12	50	57	IC 267	L. Swift	GX	13.0	2.0′ × 1.6′	PGC 10932
S7–8	1887 Oct 15	3	30	45	−34	48	56	pF; pS; eE; east and west.	3	35	31.0	−34	26	50	IC 335 = IC 1963	L. Swift	GX	11.9	2.6′ × 0.7′	PGC 13277*
S7–9	1887 Nov 24	5	1	20	−3	29	20	*[See Description for S2–30]*	5	6	53.2	−3	20	27	NGC 1788	W. Herschel (1786)	RN		8′ × 5′	LBN 916*
S7–10	1888 Feb 3	7	53	35	+0	21	49	eeF; vS; R.	7	59	7.1	+0	38	16	IC 487 = NGC 2494	A. Marth (1864)	GX	13.1	0.9′ × 0.7′	PGC 22377
S7–11	1888 Mar 8	8	16	45	+4	36	17	vF; pS; R; nr. p end of 4 st. in an arc of a circle. 1st of 3.	8	22	41.2	+4	15	44	IC 504	L. Swift	GX	13.1	1.1′ × 0.8′	PGC 23495
S7–12	1888 Mar 8	8	17	25	+4	43	31	eF; S; R; 1bM. 2nd of 3.	8	23	21.7	+4	22	21	IC 505	L. Swift	GX	13.8	1.3′ × 1.0′	PGC 23528
S7–13	1888 Mar 8	8	17	40	+4	39	40	eeF eS; R; ee diff.; 3rd of 3.	8	23	30.7	+4	17	59	IC 506	L. Swift	GX	13.6	1.2′ × 0.9′	PGC 23536
S7–14	1888 Apr 12	10	39	55	+17	30	8	eF; S; vE; in meridian * 10 mag. 5′ nf. [IC 639]	10	45	52.0	+16	55	50	IC 639	L. Swift	GX	13.7	1.1′ × 0.3′	PGC 32129
S7–15	1888 Apr 12	10	42	5	+18	46	0	vF; pS; lE; forms curve with 2 st. f. [IC 642]	10	48	8.1	+18	11	19	IC 642	L. Swift	GX	12.9	1.6′ × 1.6′	PGC 32278

(continued)

Catalog 7 (Warner observatory)

				Equinox 1890.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S7–16	1888 Apr 11	11	16	15	+18	24	28	eeF; pS; R; * nr. nf; New General Catalogue 3605, 7, 8 in field.	11	16	51.1	+17	47	54	IC 685	L. Swift	GX	13.2	1.3′ × 0.4′	PGC 34419*
S7–17	1888 Apr 17	11	20	15	+59	45	43	pF; pS; R; forms right angle with 2 st.	11	26	44.3	+59	9	20	IC 691	L. Swift	GX	13.9	0.6′ × 0.4′	PGC 35206
S7–18	1888 Apr 17	11	58	25	+63	6	17	eeF; pS; R; bet. 2 distant st., one a coarse D e e diff.	12	4	11.9	+62	30	19	IC 758	L. Swift	GX	13.3	2.0′ × 1.9′	PGC 38173
S7–19	1888 Apr 3	12	14	0	+56	36	39	eF; pS; R; bet. 2 st. in meridian, n. one = 13 mag.	12	14	22.0	+56	0	41	IC 778 = NGC 4198	W. Herschel (1789)	GX	13.6	1.0′ × 0.6′	PGC 39090*
S7–20	1888 Apr 6	12	16	5	+16	20	30	eF; S; R; nearly bet. 2 st. east and west; NGC 4312 and several others near.	12	21	38.8	+15	44	43	IC 783	L. Swift	GX	13.6	1.2′ × 1.1′	PGC 39965

S7–21	1888 Apr 7	12	19	55	+16	44	0	eF; pS; R; B * n; 4405 f.	12	25	25.1	+16	7	27	IC 787	L. Swift	GX	14.2	1.1′ × 0.4′	PGC 40517
S7–22	1888 Apr 3	12	35	30	−4	25	39	vF; vS; R.	12	41	16.0	−5	0	33	IC 804	L. Swift	GX	13.5	1.0′ × 0.5′	PGC 42549
S7–23	1888 May 6	12	36	33	+12	20	45	eF; pS; R; bet. 2 st.; all 3 point to 4621.	12	42	8.7	+11	45	16	IC 809 = IC 3672	L. Swift	GX	13.2	1.1′ × 1.0′	PGC 42638
S7–24	1888 May 6	12	36	35	+13	12	0	eF; pS; eE.	12	42	9.1	+12	35	49	IC 810	L. Swift	GX	13.6	1.6′ × 0.5′	PGC 42643
S7–25	1888 May 5	12	41	10	+10	27	13	eeeF; vS; R; * with F companion nf; np of 2.	12	46	46.3	+9	51	2	IC 816	L. Swift	GX	14.0	1.0′ × 0.7′	PGC 43111
S7–26	1888 May 5	12	41	25	+10	27	43	eeF; vS; R; sf of 2.	12	46	56.8	+9	51	25	IC 817 = IC 3764	L. Swift	GX	14.1	0.6′ × 0.5′	PGC 43126
S7–27	1888 May 6	12	44	35	−4	46	44	eeeF; pS; R; nearly bet. 2 st. east and west; 2nd of 3; [NGC] 4705, [NGC] 4718 near.	12	50	19.2	−5	21	47	IC 825	L. Swift	GX	14.7	0.6′ × 0.5′	PGC 170209*
S7–28	1888 Jun 1	12	51	35	+64	12	50	eeeF; vS; bet. 2 st. 11 and 12 mag. p and f close to latter; an eee diff. object.	12	55	54.2	+63	36	43	IC 836	L. Swift	GX	13.6	1.4′ × 0.3′	PGC 44092
S7–29	1888 Apr 17	13	3	15	+60	44	44	vF; pS; R; B * p.	13	7	36.7	+60	9	26	IC 852	L. Swift	GX	13.7	1.1′ × 0.9′	PGC 45472

(continued)

Catalog 7 (Warner observatory)

				Equinox 1890.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S7–30	1887 Apr 24	13	16	6	−12	9	13	vF; pS; R.	13	21	55	−12	43	48	IC 884	L. Swift				Missing*
S7–31	1887 Apr 24	13	18	23	−11	53	10	vF; vS; nearly bet. 2 st.; GC 3517 [NGC 5119] nr. np.	13	24	12	−12	27	38	IC 887	L. Swift				Missing*
S7–32	1888 Apr 8	13	31	30	+50	30	40	eeF; S; vE; v diff.; nearly bet. 2 st.	13	36	1.2	+49	57	39	IC 902	L. Swift	GX	13.8	2.2′ × 0.4′	PGC 47985
S7–33	1888 Apr 8	13	35	5	+51	16	40	eF; pS; R.	13	39	23.0	+51	3	4	IC 907	L. Swift	GX	14.3	1.1′ × 0.2′	PGC 48286*
S7–34	1888 Apr 17	13	43	45	+57	10	10	eF; pS; R.	13	47	41.2	+56	37	18	IC 942	L. Swift	GX	14.4	0.7′ × 0.5′	PGC 48903
S7–35	1888 Jun 7	13	45	40	+72	36	6	eee F; S; R; course D * nf points to it; np of 2.	13	47	7.9	+72	4	14	IC 945	L. Swift	GX	14.2	0.9′ × 0.7′	PGC 48867*
S7–36	1888 Apr 7	13	46	10	+14	38	0	vF; cE; pS; 3 B st. nr. f.	13	51	30.9	+14	5	32	IC 944	L. Swift	GX	13.4	1.6′ × 0.4′	PGC 49204*
S7–37	1888 Apr 7	13	46	55	+14	39	30	eF; vS; R; p close * f.	13	52	8.3	+14	6	59	IC 946	L. Swift	GX	13.4	0.9′ × 0.7′	PGC 49244*

S7–38	1888 Apr 7	13	47	10	+14	39	30	eF; S; R; 3 others suspected.	13	52	26.7	+14	5	28	IC 948	L. Swift	GX	13.2	1.2′ × 0.7′	PGC 49281*
S7–39	1888 Jun 7	13	47	38	+71	43	38	eeF; S; R; B * f little south; sf of 2.	13	49	56.9	+71	9	52	IC 954	L. Swift	GX	13.5	1.1′ × 0.6′	PGC 49083
S7–40	1888 May 6	13	47	38	+51	31	0	eeF; pS; R; course D * nr. sp.	13	51	47.2	+50	58	42	IC 951	L. Swift	GX	13.5	1.3′ × 1.3′	PGC 49215
S7–41	1888 Apr 12	14	3	0	−0	37	8	eF; vS; R; eF * attached s.	14	8	43.3	−1	9	42	IC 976	L. Swift	GX	13.0	1.4′ × 0.7′	PGC 50479
S7–42	1888 Jul 2	14	13	0	+58	19	10	eeF; S; lE; e diff. in vacancy; np of 2.	14	16	31.1	+57	48	37	IC 995	L. Swift	GX	14.0	1.3′ × 0.3′	PGC 50990
S7–43	1888 Jul 3	14	13	32	+58	9	10	eeeF; S; vE; eee diff.; sf of 2.	14	17	22.1	+57	37	48	IC 996	L. Swift	GX	13.5	1.4′ × 0.2′	PGC 51036
S7–44	1888 Jun 7	14	16	52	+72	6	6	F; S; R; B M.	14	19	26.7	+71	35	18	IC 1005 = NGC 5607	W. Herschel (1785)	GX	13.4	0.9′ × 0.8′	PGC 51182
S7–45	1887 Jul 23	14	26	15	+54	26	30	eeeF; pS; R; another or a few F st. nr.	14	29	48.4	+53	57	54	IC 1027	L. Swift	GX	14.3	1.0′ × 0.8′	PGC 51796
S7–46	1888 May 6	14	30	40	+48	31	0	eeeF; S; R; nearly pointed to by 2 D st., 1st of 3.	14	34	24.0	+48	2	15	IC 1031	L. Swift	GX	14.4	0.7′ × 0.5′	PGC 52082
S7–47	1888 May 6	14	30	45	+48	26	15	eeeF; S; R; 2nd of 3.	14	34	39.2	+47	58	6	IC 1032	L. Swift	GX	14.4	0.5′ × 0.4′	PGC 52097

(continued)

Catalog 7 (Warner observatory)

				Equinox 1890.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S7–48	1888 May 6	14	30	50	+48	25	0	eeF; pS; R; 3rd of 3.	14	34	41.8	+47	56	16	IC 1033	L. Swift	GX	14.0	0.9′ × 0.8′	PGC 52099
S7–49	1888 Jun 11	14	36	20	+69	29	53	eF; S; R; D * nr. f points to it.	14	37	53.4	+69	0	52	IC 1046	L. Swift	GX	14.1	0.8′ × 0.4′	PGC 52284
S7–50	1888 Jul 4	14	42	3	+50	51	45	eeF; L; R; forms arc of a small circle with 2 st.; 3 pB st. nr. sf in form of arc of a large circle.	14	45	49.0	+50	23	39	IC 1056 = IC 1057	L. Swift	GX	13.3	1.7′ × 1.2′	PGC 52713*
S7–51	1888 Apr 8	14	42	20	+50	50	5	eF; pS; R; bet. a pB * and a course D *, nearer the latter.	14	45	49.0	+50	23	39	IC 1057 - IC 1056	L. Swift	GX	13.3	1.7′ × 1.2′	PGC 52713*
S7–52	1888 Apr 7	14	47	0	+63	42	54	vF; pS; R.	14	49	21.6	+63	16	14	IC 1065	L. Swift	GX	13.6	0.8′ × 0.7′	PGC 52924
S7–53	1888 Apr 8	14	47	42	+54	49	40	pF; vS; R; in vacancy.	14	50	46.5	+54	24	40	IC 1069	L. Swift	GX	13.9	1.6′ × 0.8′	PGC 53000
S7–54	1888 Jul 4	14	48	25	+51	43	15	eeF; S; R.	14	51	57.3	+51	15	54	IC 1074	L. Swift	GX	14.2	1.0′ × 0.4′	PGC 53084
S7–55	1888 Aug 2	14	54	0	+68	52	10	eeF; S; R; D * in field f.	14	55	33.4	+68	24	31	IC 1083	L. Swift	GX	14.3	0.7′ × 0.4′	PGC 53362

S7–56	1888 Aug 2	15	10	32	+67	46	40	eeF; S; vE.	15	12	5.1	+67	21	46	IC 1110	L. Swift	GX	14.0	1.4′ × 0.4′	PGC 54265
S7–57	1887 Jul 13	15	31	15	+68	37	25	vF; pS; IR; D * nr. nf. Edward.	15	32	0.8	+68	14	47	IC 1129	E. Swift	GX	12.6	1.2′ × 1.0′	PGC 55330
S7–58	1888 Jun 18	15	39	38	+82	57	40	eeeF; S; lE; eee diff.; np of 2.	15	29	26.2	+82	35	2	IC 1139	L. Swift	GX	14.5	0.6′ × 0.3′	PGC 55236
S7–59	1888 Jun 18	15	41	5	+82	48	40	pF; vS; R; * nr.; sf of 2.	15	30	56.4	+82	27	21	IC 1143	L. Swift	GX	13.6	1.5′ × 1.4′	PGC 55279
S7–60	1888 Apr 12	15	44	28	+12	44	6	vF; vS; R.	15	49	47.0	+12	23	58	IC 1141	L. Swift	GX	13.4	0.5′ × 0.5′	PGC 56141
S7–61	1887 Jul 13	15	47	8	+72	47	35	eeF; pS; R; not GC. 4146 [NGC 6011]. Edward.	15	44	8.6	+72	25	52	IC 1145	E. Swift	GX	14.1	1.4′ × 0.4′	PGC 55904
S7–62	1888 Aug 2	15	48	10	+69	44	10	vF; pS; R; forms arc of circle with 2 st.; sp. of 2.	15	48	22.1	+69	23	8	IC 1146	L. Swift	GX	13.8	0.9′ × 0.7′	PGC 56085
S7–63	1888 Aug 2	15	49	55	+69	54	10	eeF; S; R; ee diff.; nf of 2.	15	50	11.7	+69	33	36	IC 1147	L. Swift	GX	14.4	0.4′ × 0.4′	PGC 56159
S7–64	1888 Jul 2	15	52	40	+70	41	40	vF; pS; R.	15	52	28.6	+70	22	31	IC 1154	L. Swift	GX	13.7	1.8′ × 1.2′	PGC 56273
S7–65	1888 Jul 4	15	53	15	+48	24	35	vF; S; R; sp of 2.	15	56	43.3	+48	5	42	IC 1152	L. Swift	GX	13.3	1.1′ × 1.0′	PGC 56450
S7–66	1888 Jul 4	15	53	30	+48	29	20	pF; pS; R; B M; pB * nr. nf; nf of 2.	15	57	3.0	+48	10	6	IC 1153	L. Swift	GX	12.9	1.2′ × 1.1′	PGC 56462

(continued)

Catalog 7 (Warner observatory)

				Equinox 1890.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S7–67	1888 Jun 15	15	55	45	+20	2	6	eeF; pS; lE; triangled with 2 nr. st. n.	16	0	37.3	+19	43	24	IC 1156	L. Swift	GX	13.8	0.8′ × 0.8′	PGC 56650
S7–68	1888 May 16	15	59	0	+14	2	43	eF; eS; R; stellar nearly bet. 2 distant F st.	16	4	13.4	+13	44	38	IC 1169	L. Swift	GX	13.3	1.0′ × 0.7′	PGC 56925
S7–69	1888 Jun 8	16	0	25	+18	15	18	eeF; pS; iR; 2 pB st. nr. s.	16	5	31.3	+17	57	49	IC 1176 = NGC 6056	L. Swift	GX	13.9	0.9′ × 0.5′	PGC 57075*
S7–70	1888 Jun 3	16	0	28	+17	53	48	eeeF; pS; bet. 2 st. 10th of 12.	16	5	33.1	+17	36	5	IC 1178	L. Swift	GX	14.1	1.3′ × 0.8′	PGC 57062*
S7–71	1888 Jun 3	16	0	28	+18	3	3	eeeF; pS; R. 11th of 12.	16	5	23.4	+17	45	26	IC 1179 = NGC 6050	L. Swift	GX	14.7	0.9′ × 0.6′	PGC 57058*
S7–72	1888 Jun 3	16	0	37	+17	53	18	eeeF; S; R. 12th of 12.	16	5	33.9	+17	35	37	IC 1181	L. Swift	GX	14.8	1.0′ × 0.7′	PGC 57063*
S7–73	1888 Jun 7	16	1	15	+18	29	18	eeeF; pS; iR; bet. 2 st.	16	6	14.9	+18	10	58	IC 1189	L. Swift	GX	14.5	0.7′ × 0.4′	PGC 57135
S7–74	1888 Jun 7	16	1	25	+18	32	43	eeeF; S; R; another and [NGC] 6061 nr. in line.	16	5	52.4	+18	13	14	IC 1190	L. Swift	GX	14.7	1.3′ × 0.4′	PGC 57111

S7–75	1888 Jun 7	16	1	27	+18	34	18	eeeF; S; lE; another and [NGC] 6061 nr. in line.	16	6	28.9	+18	16	5	IC 1191	L. Swift	GX	14.5	0.5′ × 0.2′	PGC 57152
S7–76	1888 Apr 7	16	2	45	+11	4	7	eeeF; nr. p * of 3 in a line.	16	7	58.4	+10	46	47	IC 1196	L. Swift	GX	13.7	1.1′ × 0.5′	PGC 57246
S7–77	1888 Aug 2	16	4	40	+69	58	10	pF; pS; lE; * 12 mag. p close s; sp. of 2.	16	4	29.2	+69	39	57	IC 1200 = NGC 6079	W. Herschel (1791)	GX	12.7	1.4′ × 1.0′	PGC 56946
S7–78	1888 Aug 2	16	5	55	+69	54	10	eeeF; pS; iR; eee diff.; D * nr. points to it; nf of 2.	16	5	41.7	+69	35	37	IC 1201	L. Swift	GX	14.7	1.2′ × 0.3′	PGC 57104
S7–79	1888 Apr 7	16	7	40	+10	9	6	eF; pS; R.	16	12	56.9	+9	52	2	IC 1202 = NGC 6081	E. Stephan (1870)	GX	13.1	1.8′ × 0.6′	PGC 57506
S7–80	1888 Apr 8	16	9	6	+9	48	7	eF; S; lE; B * p.	16	14	15.9	+9	32	14	IC 1205	L. Swift	GX	13.7	0.6′ × 0.4′	PGC 57574
S7–81	1888 Jun 3	16	9	59	+11	34	55	eeF; S; R.	16	15	13.1	+11	17	51	IC 1206	L. Swift	GX	13.7	1.1′ × 0.6′	PGC 57623
S7–82	1888 Jul 2	16	15	30	+68	40	40	vF; S; R. 1st of 3.	16	15	35.2	+68	23	51	IC 1215	L. Swift	GX	13.2	1.1′ × 0.7′	PGC 57638*
S7–83	1888 Jul 2	16	15	30	+66	14	48	eF; S; R; F * close p.	16	16	11.7	+65	58	8	IC 1214	L. Swift	GX	14.0	1.1′ × 0.5′	PGC 57675*
S7–84	1888 Aug 2	16	15	55	+68	37	10	eeeF; pS; R; eee diff. 2nd of 3.	16	15	55.4	+68	20	59	IC 1216	L. Swift	GX	14.1	1.0′ × 0.9′	PGC 57664*
S7–85	1888 Aug 2	16	16	25	+69	56	40	eeeF; S; R; eee diff.	16	16	4	+69	40	36	IC 1217	L. Swift				Missing
S7–86	1888 Jul 2	16	16	40	+68	29	0	vF; pS; lE. 3rd of 3.	16	16	37.1	+68	12	9	IC 1218	L. Swift	GX	13.6	1.0′ × 0.3′	PGC 57699*

(continued)

Catalog 7 (Warner observatory)

				Equinox 1890.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S7–87	1887 Jul 19	17	0	40	+63	51	40	eF; pS; R.	17	1	28.2	+63	41	28	IC 1241	L. Swift	GX	13.1	1.3′ × 1.1′	PGC 59452
S7–88	1887 Jul 19	17	9	50	+60	0	18	eeF; pS; R; bet. 2 st. p and f.	17	11	40.3	+59	59	45	IC 1248	L. Swift	GX	13.6	0.8′ × 0.5′	PGC 59791
S7–89	1887 Jul 19	17	25	30	+58	35	10	pB; pS; R; sp. of 2.	17	27	17.3	+58	29	8	IC 1258	L. Swift	GX	13.5	0.9′ × 0.7′	PGC 60320
S7–90	1887 Jul 19	17	25	40	+58	37	40	pB; pS; R; nf of 2.	17	27	24.8	+58	31	0	IC 1259	L. Swift	GX	13.1	1.1′ × 1.1′	PGC 60325
S7–91	1887 Jul 19	17	37	10	+59	26	45	eeF; pS; R; ee diff.	17	38	45.8	+59	22	23	IC 1267	L. Swift	GX	13.4	1.5′ × 1.0′	PGC 60635
S7–92	1888 May 16	17	45	32	+17	14	29	eeeF; pS; R; ee diff.	17	50	39.4	+17	12	33	IC 1268	L. Swift	GX	14.0	0.7′ × 0.5′	PGC 60971
S7–93	1888 Jun 11	17	46	48	+62	15	30	eeeF; S; R; bet. a * and 3 st. slightly curved; np of [NGC] 6488 eee diff.	17	47	47	+62	13	28	IC 1270	L. Swift				Missing
S7–94	1887 Jul 25	17	47	45	+21	33	32	eeF; pL; R; F * v nr. nf; another F * nr.	17	52	5.9	+21	34	9	IC 1269	L. Swift	GX	12.8	1.7′ × 1.3′	PGC 61023

S7–95	1887 Oct 18	18	7	15	+36	0	30	eeeF; pS; R; in a semicircle of st.; eee diff.	18	11	15.4	+36	0	28	IC 1279 = IC 1281	L. Swift	GX	13.5	2.6′ × 0.6′	PGC 61518*
S7–96	1888 Jun 11	18	14	15	+55	33	14	eF; pS; R; nearly bet. 2 p B st.	18	16	14.3	+55	35	28	IC 1286	L. Swift	GX	13.8	1.5′ × 0.5′	PGC 61666
S7–97	1887 Oct 19	18	25	40	+39	40	5	vF; S; lE; nearly bet. a D and single *.	18	29	22.5	+39	42	48	IC 1288	L. Swift	GX	13.4	1.1′ × 0.7′	PGC 61941*
S7–98	1887 Oct 19	18	26	15	+39	55	5	eeeF; pS; lE; 3 st. in line point to it.	18	30	2.4	+35	57	50	IC 1289	L. Swift	GX	14.4	0.7′ × 0.3′	PGC 61958*
S7–99	1888 Jul 12	18	46	15	+40	7	6	eeeF; S; iR; eee diff.; F * close nf both in line with 3 vF st. in form of arc of circle. The F * is in the middle. Not [NGC] 6695.	18	49	52	+40	14	45	IC 1294	L. Swift				Missing
S7–100	1887 Sep 16	20	25	50	−9	26	24	eeF; S; R; 8th mag. * s.	20	32	12.3	−9	3	21	IC 1324	L. Swift	GX	13.5	1.6′ × 1.6′	PGC 64906

Catalog 8 (Warner observatory)

				Equinox 1890.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S8–1	1888 Sep 6	1	48	55	+34	45.2		pB; pS; cE; * nr. nf.	1	55	10.2	+35	16	55	IC 171	L. Swift	GX	12.2	2.5′ × 2.2′	PGC 7139
S8–2	1888 Sep 6	2	42	25	+46	31.3		eF; lE; S; in vacancy. 1st of 3.	2	49	40.3	+46	57	16	IC 256	L. Swift	GX	15.3	0.3′ × 0.2′	PGC 10737*
S8–3	1888 Sep 6	2	42	30	+46	31.6		eF; pS; R; in vacancy, v diff. 2nd of 3.	2	49	45.6	+46	58	35	IC 257	W. Herschel (1786)	GX	12.6	2.2′ × 1.6′	PGC 10729*
S8–4	1888 Sep 6	2	43	40	+46	30.3		eeeF; pS; in line with 2 nr. F st. 3rd of 3.	2	51	0.9	+46	57	18	IC 260	L. Swift	GX	13.1	1.4′ × 0.9′	PGC 10812
S8–5	1888 Nov 3	2	44	30	+42	22.3		eeF; pS; R; bet. a F and a pB *; ee diff. Edward.	2	51	43.3	+42	49	42	IC 262	E. Swift	GX	13.5	1.6′ × 1.3′	PGC 10850
S8–6	1888 Nov 3	2	47	42	+41	12.7		eeF; eS; R; 1129 near.	2	54	44.0	+41	39	19	IC 265	L. Swift	GX	14.6	0.7′ × 0.7′	PGC 10978
S8–7	1888 Nov 3	2	47	55	+41	48.7		eF; eS; R.	2	55	4.9	+42	15	44	IC 266	L. Swift	GX	14.6	0.7′ × 0.3′	PGC 11002

S8–8	1888 Oct 31	2	52	48	+43	46.4		eeeF; pS; R; eee diff.; p of 2. The most diff. object yet seen here. Another still fainter suspected near.	3	0	5	+44	12.8		IC 274	L. Swift				Missing
S8–9	1888 Oct 31	2	53	38	+43	54.4		eeeF; pS; R; F * nr. p; D * nr. sp.; bet. 2 st.; f of 2.	3	0	55.9	+44	21	1	IC 275	L. Swift	GX	14.4	1.2′ × 0.9′	PGC 11389
S8–10	1888 Oct 27	2	56	8	+41	55.3		eF; pS; R.	3	3	3.2	+42	21	19	IC 280	L. Swift	AST			Group of stars
S8–11	1888 Nov 1	2	57	20	+41	55.3		eeeF; vS; * close n; 1175 near.	3	4	37.2	+42	21	46	IC 281 = NGC 1177	L. Parsons (1874)	GX	14.5	0.4′ × 0.4′	PGC 11581
S8–12	1888 Oct 27	2	58	0	+41	25.5		eF; S; R; bet. 2 nr. st.	3	6	13.2	+41	50	56	IC 282 = NGC 1198	E. Stephan (1880)	GX	12.5	1.9′ × 1.1′	PGC 11648
S8–13	1888 Oct 27	2	58	45	+41	56.2		eeF; pL; lE; D * nr. np; bet. 2 st.	3	6	9.9	+42	22	19	IC 284	L. Swift	GX	11.5	4.1′ × 2.1′	PGC 11643
S8–14	1888 Oct 31	3	0	15	+41	56.4		vF; vS; R; 2 pB st. nf point to it; r suspected.	3	7	32.9	+42	23	15	IC 288	L. Swift	GX	13.9	1.1′ × 0.3′	PGC 11702
S8–15	1888 Sep 2	3	1	30	+60	54.2		pB; pL; R; bet. 2 vF st.	3	10	19.2	+61	19	2	IC 289	L. Swift	PN	13.5	0.7′ × 0.5′	PK 138 + 2.1

(continued)

Catalog 8 (Warner observatory)

				Equinox 1890.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S8–16	1888 Sep 11	3	2	31	+40	33.8		eeeF; S; R; in field with Algol.	3	9	42.7	+40	58	27	IC 290	L. Swift	GX	14.6	1.1′ × 0.2′	PGC 11817
S8–17	1888 Sep 11	3	3	6	+40	20.5		eF; pS; R; * nr. s; bet. 2 st.; in field with Algol.	3	10	12.9	+40	45	57	IC 292	L. Swift	GX	13.5	1.2′ × 0.6′	PGC 11846
S8–18	1888 Sep 11	3	3	41	+40	43.3		eF; S; R; in finder field with Algol.	3	10	56.2	+41	8	14	IC 293	L. Swift	GX	14.6	0.8′ × 0.6′	PGC 11873
S8–19	1888 Sep 11	3	3	46	+40	12.8		vF; pS; iR; in finder field with Algol.	3	11	3.1	+40	37	20	IC 294 = IC 296	L. Swift	GX	13.8	1.4′ × 1.0′	PGC 11878*
S8–20	1888 Sep 11	3	3	51	+40	11.8		eF; pS; R; in field with Algol.	3	11	0	+40	36.9		IC 295	L. Swift				Missing
S8–21	1888 Sep 14	3	3	55	+40	12.5		eF; pS; iR; F D * nr. p.	3	11	3.1	+40	37	20	IC 296 = IC 294	L. Swift	GX	13.8	1.4′ × 1.0′	PGC 11878*

S8–22	1888 Sep 15	3	6	0	+41	41.5		eeeF; pS; R; 4 st. in line s; F * p close sp.; eee diff.	3	13	15	+42	6.4		IC 297	L. Swift				Missing
S8–23	1888 Sep 15	3	6	50	+42	2.0		eF; S; R; 8 mag. * in field sp.; p of 2.	3	14	16.0	+42	24	55	IC 300	L. Swift	GX	15.0	0.3′ × 0.3′	PGC 2198416
S8–24	1888 Sep 15	3	7	25	+41	49.0		eF; pS; R; f of 2.	3	14	47.7	+42	13	21	IC 301	L. Swift	GX	14.1	0.9′ × 0.9′	PGC 12074
S8–25	1888 Sep 11	3	8	46	+40	46.2		eF; pS;iR; resolvability suspected.	3	16	15.8	+41	10	51	IC 308	L. Swift	GX	14.8	1.2′ × 1.2′	PGC 12152
S8–26	1888 Sep 11	3	8	49	+40	23.8		eeF; pS; R; bet. 2 st.	3	16	6.3	+40	48	16	IC 309	L. Swift	GX	13.5	0.9′ × 0.9′	PGC 12141
S8–27	1888 Oct 10	3	9	30	+39	36.0		eF; pS; iR; bet. 2 st.; vF * close f.	3	16	46.7	+40	0	13	IC 311	L. Swift	GX	14.4	0.9′ × 0.6′	PGC 12177
S8–28	1888 Nov 3	3	9	30	+40	55.5		vF; pS; R; [NGC] 1259, [NGC] 1260 in field. Edward.	3	16	43.0	+41	19	29	IC 310	E. Swift	GX	12.7	1.3′ × 1.3′	PGC 12171
S8–29	1888 Nov 3	3	10	52	+41	20.3		eeF; pS; R; nearly bet. 2 st.	3	18	8.4	+41	45	16	IC 312	L. Swift	GX	13.4	1.0′ × 0.5′	PGC 12279

(continued)

Catalog 8 (Warner observatory)

				Equinox 1890.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S8–30	1888 Sep 11	3	11	40	+41	5.0		eF; S; R.	3	18	58.1	+41	28	12	NGC 1270	H. d'Arrest (1863)	GX	13.1	1.5′ × 1.2′	PGC 12350
S8–31	1888 Sep 14	3	12	27	+41	11.2		eeF; S; R; one of 3 in a line; about a dozen in field, identification diff.	3	19	47.8	+41	35	47		L. Swift	GX	14.6	0.7′ × 0.6′	PGC 12430*
S8–32	1888 Sep 14	3	12	31	+41	10.0		eeF; vS; R; close D with 1276; M of 3 in a line; 1271, 73, 76,78 in field.	3	19	51.5	+41	34	24	NGC 1277	J. L. E. Dreyer (1875)	GX	13.5	1.0′ × 0.4′	PGC 12434*
S8–33	1888 Sep 14	3	13	40	+41	29.8		eeF; vS; R; e close D * nr. s.	3	20	57.9	+41	53	38	IC 313	L. Swift	GX	14.1	1.3′ × 0.9′	PGC 12558
S8–34	1888 Sep 14	3	14	7	+41	32.0		eeeF; pS; R.	3	21	19.9	+41	55	55	IC 316	L. Swift	GX	14.1	1.4′ × 0.7′	PGC 12576/12578
S8–35	1888 Sep 14	3	18	40	+40	24.0		eF; pS; R; vF * close p.	3	25	59.2	+40	47	20	IC 320	L. Swift	GX	14.3	1.6′ × 1.5′	PGC 12819

S8–36	1888 Oct 27	3	22	10	+41	28.8		eF; S; R; * v nr.; p of 2.	3	29	30	+41	51.7		IC 323	L. Swift	AST			three stars
S8–37	1888 Oct 27	3	22	40	+41	26.8		eF; pS; R; f of 2.	3	30	1.8	+41	49	55	NGC 1334	H. d'Arrest (1863)	GX	13.1	1.5′ × 0.7′	PGC 13001
S8–38	1889 Feb	5	13	24	−25	12.4		vF; pS; E; 5′ n of 8 1/2 mag. star.	5	18	4.1	−25	10	15	IC 408	L. Swift	AST			Double star
S8–39	1889 Feb	5	15	45	−25	26.4		vF; pS; R.	5	20	18.6	−25	19	28	IC 411	L. Swift	GX	13.5	1.2′ × 0.9′	PGC 17130
S8–40	1889 Feb	5	15		−25			See note.	5	20		−25				L. Swift				*
S8–41	1889 Feb	5	15		−25			See note.	5	20		−25				L. Swift				*
S8–42	1888 Sep 6	6	25	50	+67	57.5		eF; S; R; B * sf.	6	37	21.3	+67	51	35	IC 445	L. Swift	GX	13.2	1.2′ × 0.9′	PGC 19328
S8–43	1888 Sep 6	6	32	55	+71	27.5		pF; S; R; BM; bet. 2 D st.	6	45	41.1	+71	20	38	IC 449	L. Swift	GX	12.6	1.7′ × 1.3′	PGC 19554
S8–44	1888 Sep 14	7	1	45	+50	19.0		eeeF; vS; F * nr. s; 2nd of 6; others suspected; obscured by twilight.	7	10	34.1	+50	7	8	IC 458	B. Stoney (1851)	GX	13.5	0.9′ × 0.4′	PGC 20306
S8–45	1888 Sep 14	7	2	25	+50	19.0		eeF; S; R; 3rd of 6.	7	10	45.0	+50	4	53	IC 461	B. Stoney (1851)	GX	14.7	0.7′ × 0.4′	PGC 20319

(continued)

Catalog 8 (Warner observatory)

				Equinox 1890.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S8–46	1888 Sep 14	7	2	35	+50	19.0		eF; S; R; wide D * nr. n; 4th of 6; 2332–4, 2340 near.	7	11	0.9	+50	7	7	IC 463	B. Stoney (1851)	GX	15.0	0.3′ × 0.2′	2MASXJ07110091 + 5,007,039
S8–47	1888 Feb 3	8	19	30±	−0	5.3		eeF; pS; vlE; bet. 2 st.; sev. pB st. nr.; driving clock failed.	8	25	2.0	−0	35	29	IC 507 = NGC 2590	E. Stephan (1878)	GX	13.1	2.2′ × 0.7′	PGC 23616*
S8–48	1888 Sep 1	8	28	45	+73	53.0		vF; S; cE; wide D * nr. sf; sp of 2.	8	50	22.1	+73	27	47	IC 511 = NGC 2646	W. Tempel	GX	12.1	1.3′ × 1.3′	PGC 24838*
S8–49	1888 Aug 29	8	41	45	+73	54.1		pB; pL; R; BM; nearly bet. a nr. and a distant *; nf of 2; another suspected.	8	53	42.3	+73	29	27	IC 520	L. Swift	GX	11.7	1.9′ × 1.5′	PGC 24970
S8–50	1889 Mar 25	9	51	15	−13	37.7		pF; pS; R.	9	56	39.4	−13	46	30	IC 579	L. Swift	GX	13.9	1.1′ × 0.4′	PGC 28702*

S8–51	1889 Mar 27	10	6	25	+43	47.0		vF; vS; R; BM. Almost stellar.	10	12	48.6	+43	8	44	IC 598	L. Swift	GX	12.9	1.6′ × 0.5′	PGC 29745
S8–52	1889 Mar 29	10	18	15	+17	19.9		eeF; pS; R; * nr. sp.; 2 nr. sf points to it; e diff.	10	24	8.6	+16	44	31	IC 607	L. Swift	GX	13.5	1.5′ × 1.3′	PGC 30496
S8–53	1889 Apr 20	10	20	15	+20	47.4		eeF; pS; cE; in center of semicircle of 3 wide D st; ee diff.	10	26	28.4	+20	13	42	IC 610 = IC 611	L. Swift	GX	13.8	1.9′ × 0.3′	PGC 30670*
S8–54	1889 Apr 22	10	20	25	+20	48.4		eF; S; lE.	10	26	28.4	+20	13	42	IC 611 = IC 610	L. Swift	GX	13.8	1.9′ × 0.3′	PGC 30670*
S8–55	1889 Apr 21	10	27	40	+13	6.7		eeF; S; R; a p l triangle of 3 F st. nr. f, one a vF D.	10	33	50.0	+12	52	43	IC 619	L. Swift	GX	13.7	1.0′ × 0.8′	PGC 31235*
S8–56	1889 Apr 22	11	15	25	+20	49.3		eF; eS; R; vF * close np.	11	22	14.7	+20	12	31	IC 682 = NGC 3649	W. Herschel (1784)	GX	13.7	1.2′ × 0.6′	PGC 34883*
S8–57	1889 Apr 22	11	25	10	+21	4.3		eF; vS; R; 2 pB st. sf.	11	31	0.7	+20	28	9	IC 701	L. Swift	GX	14.2	0.7′ × 0.5′	PGC 35494
S8–58	1889 Apr 21	11	26	15	−10	59.4		eeF; S; R; p of 2.	11	31	49	−11	35.8		IC 703	L. Swift				Missing
S8–59	1889 Apr 21	11	26	20	−10	56.4		eF; vS; f of 2;? close D.	11	31	54	−11	32.8		IC 704	L. Swift				Missing

(continued)

Catalog 8 (Warner observatory)

				Equinox 1890.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S8–60	1889 Apr 22	11	45	15	+21	24.9		eeeF; pS; R; pB * sp.	11	51	2.2	+20	47	59	IC 742	L. Swift	GX	14.0	1.2′ × 1.1′	PGC 37056
S8–61	1889 Apr 20	11	55	30	+14	44.2		eeF; S; E; bet. the n 2 of 3 st. forming a large triangle.	12	1	10.4	+14	6	16	IC 755 = NGC 4019	J. Herschel (1832)	GX	12.8	2.2′ × 0.3′	PGC 37912*
S8–62	1889 Mar 25	12	16	55	−3	57.1		vF; pL; vE; pB * s.	12	22	30.0	−4	39	10	IC 784	L. Swift	GX	13.1	2.0′ × 0.7′	PGC 40092*
S8–63	1888 May 6	12	22	25	+10	2.3		eF; S; eE; 3 others in field.	12	28	15.9	+9	26	11	IC 793 = NGC 4445	H. d′Arrest (1865)	GX	12.8	2.6′ × 0.5′	PGC 40987
S8–64	1889 Apr 21	12	28	15	−6	45.4		eF; eS; R;? eF * is in contact on p side	12	33	49.9	−7	22	32	IC 799 = NGC 4520	W. Herschel (1789)	GX	14.0	1.1′ × 0.5′	PGC 41748
S8–65	1889 Apr 20	12	35	45	+14	20.5		vF; pL; R; 2 pB st. n and nf.	12	41	25.4	+13	43	46	IC 805 = NGC 4611	E. Stephan (1881)	GX	14.3	1.2′ × 0.3′	PGC 42564
S8–66	1889 Mar 25	12	51	0	−6	7.9		vF; S; R.	12	56	38.2	−6	44	0	IC 833	L. Swift	GX	14.5	0.3′ × 0.2′	PGC 158287

S8–67	1889 May 3	12	59	50	+12	42.0	?	eeeF; S; R; F * nr. p.	13	4	57.4	+12	4	45	IC 845	L. Swift	GX	14.5	0.3′ × 0.3′	PGC 45234*
S8–68	1889 Apr 22	13	11	50	+21	14.4		eeF; pS; R; 1st of 5.	13	17	16.7	+20	41	27	IC 866	L. Swift	GX	14.5	1.1′ × 0.4′	PGC 46279*
S8–69	1889 Apr 22	13	11	50	+21	16.4		eeF; pS; R; 2nd of 5.	13	17	30.0	+20	41	3	IC 869	L. Swift	GX		0.3′ × 0.3′	PGC 1633609*
S8–70	1889 Apr 22	13	12	0	+21	11.9		eeF; pS; R; 3rd of 5.	13	17	19.8	+20	38	17	IC 867	L. Swift	GX	14.1	1.5′ × 1.0′	PGC 46283*
S8–71	1889 Apr 22	13	12	1	+21	10.4		eeF; pS; R; 4th of 5. D with 5th.	13	17	28.5	+20	36	44	IC 868	L. Swift	GX	14.4	0.5′ × 0.5′	PGC 46281
S8–72	1889 Apr 22	13	12	2	+21	10.4		eeF; pS; R; 5th of 5. 4 pB st. in a curve sf. point to the 1st, 3rd, 4th and 5th.	13	17	30.9	+20	36	0	IC 870	L. Swift	GX	14.5	0.7′ × 0.4′	PGC 46286
S8–73	1889 May 3	13	17	15	+21	54.4		vF; pS; R.	13	22	30.9	+21	18	59	IC 885	L. Swift	GX	13.7	0.8′ × 0.8′	PGC 46722
S8–74	1889 May 3	13	20	25	+14	19.0		eeeF; pS; R.	13	24	51.4	+13	44	16	IC 888 = NGC 5136	W. Herschel (1784)	GX	14.0	0.3′ × 0.3′	PGC 46905*
S8–75	1888 Sep 1	13	27	20	+36	13.5		vF; pL; R;* in center? D.	13	42	8.4	+35	39	15	IC 895 = NGC 5273	W. Herschel	GX	11.5	2.8′ × 2.5′	PGC 48521*

(continued)

Catalog 8 (Warner observatory)

				Equinox 1890.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S8–76	1889 Apr 20	13	46	10	+14	39.5		eF; pS; vE; B * in field sf; 1st of 3.	13	51	30.9	+14	5	32	IC 944	L. Swift	GX	13.4	1.6′ × 0.4′	PGC 49204*
S8–77	1889 Apr 20	13	46	45	+14	40.5		eF; S; R; * close sf; 2nd of 3.	13	52	8.3	+14	6	59	IC 946	L. Swift	GX	13.4	0.9′ × 0.7′	PGC 49244*
S8–78	1889 Apr 20	13	47	0	+14	39.5		eF; vS; R; 3rd of 3.	13	52	26.7	+14	5	28	IC 948	L. Swift	GX	13.2	1.2′ × 0.7′	PGC 49281*
S8–79	1889 Apr 20	13	50	45	+14	3.2		eeF; S; R.	13	56	3.4	+13	30	21	IC 959	L. Swift	GX	13.2	1.8′ × 1.0′	PGC 49540
S8–80	1889 Apr 7	13	51	55	+12	35.2		pF; vS; R; BM.	13	57	13.2	+12	1	16	IC 962	L. Swift	GX	13.3	0.8′ × 0.8′	PGC 49626
S8–81	1888 Sep 1	14	28	15	+42	19.8		pB; S; R; F * close nf.	14	42	28.9	+41	50	32	IC 1028 = NGC 5739	W. Herschel	GX	12.1	2.3′ × 2.1′	PGC 52531*
S8–82	1888 Sep 1	14	36	35	+43	12.8		eeeF; pS; R; nearly bet. 2 st, forms triangle with 2 st.; eee diff.	14	50	39.4	+42	44	27	IC 1045	L. Swift	GX	14.3	0.5′ × 0.5′	PGC 52995*
S8–83	1889 Apr 22	14	49	45	+18	34.3		eeeF; pS; R; ee diff.; p of 2.	14	54	49.3	+18	6	22	IC 1075	L. Swift	GX	13.8	1.2′ × 0.6′	PGC 53314

S8–84	1889 Apr 22	14	49	50	+18	29.3		eeeF; pS; R; in vacancy; pB * sp.; f of 2.	14	54	59.6	+18	2	14	IC 1076	L. Swift	GX	13.5	1.0′ × 0.5′	PGC 53320
S8–85	1889 May 26	15	3	20	+14	26.0		eeF; S; lE; * 9 mag. in field sf.	15	8	35.0	+13	40	15	IC 1095	L. Swift	GX	14.8	0.6′ × 0.5′	PGC 54063*
S8–86	1888 Aug 27	15	11	20	+54	56.0		pB; S; R; triangle with 2 st.	15	9	31.6	+54	30	23	IC 1111 = NGC 5876	L. Swift	GX	12.7	2.4′ × 1.2′	PGC 54110*
S8–87	1889 May 28	15	16	35	−4	4.0		eeF; S; R; pB * nr. sf.	15	22	19.0	−4	28	28	IC 1115	L. Swift	AST			Faint double star
S8–88	1889 May 28	15	25	45	+24	1.6		eeF; vS; vE; 2 pB st. in field n.	15	30	0.6	+23	38	18	IC 1124	L. Swift	GX	13.4	0.9′ × 0.4′	PGC 55254
S8–89	1889 May 28	15	32	15	−1	10.9		pF; pS; R.	15	37	52.9	−1	44	6	IC 1128	L. Swift	GX	13.9	1.1′ × 0.9′	PGC 55648*
S8–90	1889 May 28	15	59	20	+14	4.5		eF; vS; stellar; pB * n little f.	16	4	13.4	+13	44	38	IC 1169	L. Swift	GX	13.1	1.0′ × 0.7′	PGC 56925
S8–91	1889 May 27	16	14	10	+53	16.9		pB; vS; R; BM.	16	16	51.9	+53	0	21	IC 1211	L. Swift	GX	12.7	1.0′ × 0.9′	PGC 57707
S8–92	1889 May 13	17	6	29	+36	27.0		vF; pS;iR; bet. a F and a pB *; 3 st. in line nr.	17	10	33.6	+36	18	13	IC 1244	L. Swift	GX	13.7	1.0′ × 1.0′	PGC 59746*
S8–93	1888 Sep 8	17	25	0	+71	22.5		eeF; pS; R; in a dark vacancy.	17	23	26.1	+71	15	46	IC 1261	L. Swift	GX	14.0	0.9′ × 0.8′	PGC 60185

(continued)

Catalog 8 (Warner observatory)

				Equinox 1890.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S8–94	1888 Aug 5	17	58	45	−24	27.3		eeeF; vL; [NGC] 6523 nr. p; ee diff.; B * inv or is a neb.*; discovered 2 years ago.	18	5	13.0	−24	24	38	IC 1271	J. Herschel (1836–1837)	EN			Part of M8
S8–95	1889 Apr 10	18	5	10	−7	15.2		eeeF; vL; ee diff.; D * close to p edge; v wide D * nr. n.	18	10	44.3	−7	12	27	IC 1276	L. Swift	GC	10.3	7′	Palomar 7
S8–96	1889 May 28	18	7	45	+35	59.9		eeF; S; cE; semicircle of sev. st. nr. f.	18	11	15.4	+36	0	28	IC 1281 = IC 1279	L. Swift	GX	13.5	2.6′ × 0.6′	PGC 61518*
S8–97	1888 Aug 29	18	39	40	+56	12.3		eeeF; S; lE; * in center? D; another nr. suspected sf.	18	41	41.5	+56	18	47	IC 1293	L. Swift	AST			Asterism

S8–98	1888 Sep 23	20	27	33	+9	30.2		vF; S; 3 or 4 F st. inv.; sp. of 2.	20	32	50.2	+9	55	35	IC 1325 = NGC 6928	A. Marth (1863)	GX	12.2	2.0′ × 0.6′	PGC 64932
S8–99	1888 Sep 23	20	27	43	+9	31.1		eeeF; S; eE; spindle; pF * nr. s; wide D * nr. sf; ee diff.; nf of 2.	20	32	58.8	+9	52	27	IC 1326 = NGC 6930	A. Marth (1863)	GX	12.8	1.3′ × 0.5′	PGC 64935
S8–100	1887 Sep 14	21	34	50	+14	8.5		eF; S; R.	21	40	13.0	+14	37	59	IC 1394	L. Swift	GX	14.2	1.0′ × 0.9′	PGC 67145

Catalog 9 (Warner observatory)

				Equinox 1890.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S9–1	1889 Sep 18	0	29	55	+8	31.7		vF; pS; lE.	0	35	36.4	+9	7	27	IC 34	T. Safford (1867)	GX	12.7	3.2′ × 1.2′	PGC 2134
S9–2	1889 Sep 28	1	13	35	−17	38.8		vF; pS; lE; 8 mag. * f. 46″ 1′ north.	1	19	2.3	−17	3	37	IC 93 = IC 1671	L. Swift	GX	13.2	1.3′ × 0.5′	PGC 4724*
S9–3	1889 Oct 3	1	43	5	+9	58.5		eeF; S; cE; bet. 2 distant st. in meridian.	1	48	43.9	+10	30	27	IC 161	L. Swift	GX	13.8	0.7′ × 0.5′	PGC 6644*
S9–4	1889 Nov 25	1	43	25	+20	9.6		eeeF; pL; R.	1	49	15.0	+20	42	40	IC 163	T. Safford (1866)	GX	13.1	1.9′ × 0.9′	PGC 6675
S9–5	1889 Oct 23	1	43	50	−4	28.2		pF; S; R; bet. 2 st.? cluster of eeF st.	1	49	8.4	−3	54	16	IC 164	L. Swift	GX	13.1	1.6′ × 1.3′	PGC 6666
S9–6	1890 Jan 18	1	44	0	+27	4.8		eF; S; lE; vF * close f. Found searching for Swift's Comet [64P/ Swift-Gehrels]. Edward.	1	50	14.0	+27	38	44	IC 165 = NGC 684	W. Herschel (1786)	GX	12.4	3.2′ × 0.6′	PGC 6759

S9–7	1890 Jan 18	1	55	38	+25	56.4		eeF; R. Found searching for Swift's Comet [64P/ Swift-Gehrels]. Edward.	2	1	30.8	+26	28	52	IC 187	E. Swift	GX	12.9	2.1′ × 0.8′	PGC 7683*
S9–8	1890 Jan 18	1	55	43	+26	29.8		eeeF; vS; R; 2 st. point to it. Found searching for Swift's Comet [64P/ Swift-Gehrels]. Edward.	2	1	58	+27	1.7		IC 188	E. Swift	GX			Missing
S9–9	1889 Oct 20	1	56	25	+17	50.2		pB; pL; lE.	2	2	29.3	+18	22	23	IC 191 = NGC 794	W. Herschel (1784)	GX	12.7	1.3′ × 1.1′	PGC 7763
S9–10	1889 Oct 20	1	57	45	+14	10.2		eeF; S; R; F * nr. s; sp of 2.	2	3	44.6	+14	42	33	IC 195	L. Swift	GX	13.1	1.5′ × 0.8′	PGC 7846
S9–11	1889 Oct 20	1	58	0	+14	11.6		pF; pS; R; trap. with 3 st.; nf of 2.	2	3	49.8	+14	44	21	IC 196	L. Swift	GX	12.9	2.8′ × 1.4′	PGC 7856
S9–12	1889 Dec 25	3	31	40	−7	5.2		eeF; pL; R; trap. with 3 st.	3	37	4	−6	43.4		IC 337	L. Swift				Missing

(continued)

Catalog 9 (Warner observatory)

				Equinox 1890.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S9–13	1889 Dec 23	3	36	6	−5	2.1		eeF; pL; R; 1st of 3 in line with 1417–18; cometary; unable to find it; seeing good. Failed also at Harvard College Observatory.	3	41	29.6	−4	39	57	IC 344	J. Herschel (1827)	GX	14.2	0.9′ × 0.4′	PGC 13568*
S9–14	1889 Dec 25	3	37	5	−4	40.0		eF; vS; R; stellar.	3	42	32.7	−4	17	55	IC 347	L. Swift	GX	12.7	1.2′ × 0.9′	PGC 13622
S9–15	1889 Oct 20	4	43	45	+0	3.3		eF; vS; R; F * close f.	4	49	34.0	+0	15	10	IC 395	L. Swift	GX	12.9	1.1′ × 0.9′	PGC 16095
S9–16	1889 Dec 27	6	45	4	+13	2.0		eeF; S; e diff.	6	51	6.3	+12	55	19	IC 454	E. E. Barnard (1889)	GX	13.4	1.2′ × 0.7′	PGC 19725
S9–17	1890 Apr 20	7	35	5	+49	56.5		eF; pS; R; np of 2.	7	43	36.4	+49	40	4	IC 471	L. Swift	GX	13.3	0.7′ × 0.7′	PGC 21659
S9–18	1890 Apr 20	7	35	20	+49	54.0		eeF; pS; R; sf of 2; D * nr. sf nearly points to both.	7	43	50.3	+49	36	52	IC 472	L. Swift	GX	13.4	1.8′ × 1.0′	PGC 21665

S9–19	1890 May 8	8	46	7	+57	35.0		pF; pS; R; B M; pB * np;? eeF D * involved.	8	54	34.9	+57	10	0	IC 522	L. Swift	GX	13.0	1.0′ × 0.8′	PGC 25009
S9–20	1890 Apr 19	9	2	50	+38	3.2		eeeF; pL; R; ee diff.; [NGC] 2759 in field sf.	9	9	41.8	+37	36	6	IC 527	L. Swift	GX	13.2	1.7′ × 1.5′	PGC 25821
S9–21	1890 Feb 15	9	25	0	−3	46.0		eeF; pS; R; 10 m. * s.	9	30	32	−4	14.9		IC 541	L. Swift				Missing
S9–22	1890 May 8	10	16	32	+57	35.0		eeeF; vS; eeE; spindle? several eeF st. in a line.	10	23	44.3	+57	1	38	IC 604 = NGC 3220	W. Herschel (1793)	GX	12.9	1.3′ × 0.5′	PGC 30462
S9–23	1890 Jan 29	10	28	45	+11	46.0		vF; pS; E; 9 m. * s.	10	34	42.8	+11	11	50	IC 622 = NGC 3279	D. Todd (1878)	GX	13.4	2.9′ × 0.3′	PGC 31302
S9–24	1890 May 8	10	44	56	+55	59.0		eeeF; pS; lE; B * sf; sp of 2.	10	51	31.5	+55	23	28	IC 644 = NGC 3398	W. Herschel (1789)	GX	13.6	1.0′ × 0.3′	PGC 32564
S9–25	1890 May 8	10	45	3	+56	3.3		eeF; pS; R; nf of 2.	10	51	35.2	+55	27	57	IC 646	L. Swift	GX	14.4	1.3′ × 0.6′	PGC 32568
S9–26	1890 May 11	11	18	15	+48	27.0		eF; eS; R; stellar to Nu; F * nr. f; another sus. nr. p.	11	24	17.4	+47	50	51	IC 687	L. Swift	GX	14.1	1.1′ × 1.0′	PGC 35029
S9–27	1890 May 11	11	26	55	+50	51.5		eeF; vS; R.	11	32	56.3	+50	14	31	IC 705	L. Swift	GX	14.5	0.8′ × 0.5′	PGC 35644

(continued)

Catalog 9 (Warner observatory)

				Equinox 1890.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S9–28	1890 May 11	11	28	5	+49	41.0		eF; S; R. 1st of 4.	11	33	59.2	+49	3	43	IC 708	L. Swift	GX	13.1	1.4′ × 0.9′	PGC 35720
S9–29	1890 May 11	11	28	20	+49	40.5		eeF; S; R; 2nd of 4.	11	34	14.6	+49	2	35	IC 709	L. Swift	GX	13.9	0.7′ × 0.6′	PGC 35736
S9–30	1890 May 11	11	28	55	+49	34.5		eeeF; pS; R; F * close sp. 3rd of 4.	11	34	46.6	+48	57	22	IC 711	L. Swift	GX	14.1	0.6′ × 0.6′	PGC 35780
S9–31	1890 May 11	11	29	0	+49	42.0		eF; S; R; pB * nr. nf. 4th of 4.	11	34	49.3	+49	4	39	IC 712	L. Swift	GX	13.7	1.1′ × 0.7′	PGC 35785
S9–32	1890 May 11	11	40	10	+50	10.5		vF; vS; R.	11	45	9.3	+49	43	7	IC 731	L. Swift	GX	13.7	1.0′ × 0.5′	PGC 36613*
S9–33	1890 May 8	11	44	55	+55	58.0		eeF; pL; iR; [NGC] 3916–3921 in field.	11	50	38.9	+55	21	14	IC 740 = NGC 3913	W. Herschel (1789)	GX	12.6	2.6′ × 2.6′	PGC 37024
S9–34	1890 May 23	12	28	34	+52	52.4		eeF; S; R; * close n.	12	33	45.0	+52	15	17	IC 801	L. Swift	GX	13.7	1.2′ × 1.0′	PGC 41739
S9–35	1890 Jun 8	12	46	30	+54	16.8		vF; vS; lE; stellar.	12	51	16.5	+53	41	47	IC 830	L. Swift	GX	13.6	0.8′ × 0.4′	PGC 43533

S9–36	1890 May 11	13	0	45	+54	16.3		vF; S; R; bet. 2 st.	13	5	32.2	+53	41	7	IC 847 = NGC 4973	W. Herschel (1789)	GX	13.8	0.7′ × 0.7′	PGC 45280
S9–37	1890 Jun 8	13	4	5	+53	20.8		eeF; pS; R; bet. 2 distant st. Edward.	13	8	41.7	+52	46	27	IC 853 = IC 4205	E. Swift	GX	13.9	1.1′ × 1.0′	PGC 45560*
S9–38	1890 Jun 15	13	12	42	+58	7.5		eF; vS; R; stellar.	13	17	7.5	+57	32	22	IC 875	L. Swift	GX	12.8	1.2′ × 1.1′	PGC 46263
S9–39	1890 Apr 19	13	50	15	+5	34.4		eeeF; pS; iR; seen only by glimpses.	13	55	38.7	+4	59	5	IC 958 = NGC 5360	A. Marth (1864)	GX	13.3	1.7′ × 0.8′	PGC 49513*
S9–40	1887 Jun 24	14	34	50	+51	18.3		eeF; pS; R; bet. 2 st.	14	38	33.3	+50	48	55	NGC 5720	L. Swift	GX	13.4	2.1′ × 1.4′	PGC 52328
S9–41	1889 Jul 2	14	36	55	+62	30.2		eeF; pS; R; nearly bet. 2 distant wide D st.	14	39	33.1	+62	0	11	IC 1049	L. Swift	GX	13.8	0.9′ × 0.7′	PGC 52379
S9–42	1887 Jun 24	14	52	30	+49	1.8		vF; pS; eE; spindle; pB * close to p end; [GC] 4014, 15, 19, 20 [NGC 5794, 5797, 5804, 5805] in field.	14	56	19.6	+49	23	56	NGC 5795	L. Swift	GX	13.8	1.6′ × 0.3′	PGC 53402*
S9–43	1887 Jun 24	14	57	10	+50	26.6		eF; pS; R; bet. 2 distant st.	15	0	46.1	+49	59	38	NGC 5828	L. Swift	GX	13.5	0.6′ × 0.5′	PGC 53618
S9–44	1887 Jun 19	14	59	20	+13	3.8		vF; S; R; D * nf points to it; planetary.	15	4	40.6	+12	38	1	NGC 5837	L. Swift	GX	13.7	1.0′ × 0.6′	PGC 53817

(continued)

Catalog 9 (Warner observatory)

				Equinox 1890.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S9–45	1889 Jun 22	15	4	5	+63	24.8		vF; pS; lE; bet. 2 st.	15	6	20.8	+62	58	52	IC 1100 = NGC 5881	W. Herschel (1789)	GX	13.3	0.8′ × 0.7′	PGC 54150
S9–46	1890 Jun 8	15	4	10	+56	54.8		eeeF: pS; R; midway bet. 2 vF nr. st. Edward.	15	6	54.6	+56	30	32	IC 1099	E. Swift	GX	14.0	1.2′ × 1.0′	PGC 53967
S9–47	1890 Jun 19	15	5	30	+6	11.0		Edward. No description was recorded; seen by us both after the telescope was moved we disagreed as to description so I left it blank rather than be in error.	15	10	56.1	+5	44	42	IC 1101	E. Swift	GX	13.9	1.2′ × 0.6′	PGC 54167
S9–48	1890 Jun 19	15	12	20	+7	38.0		eeF; pS; R. Edward.	15	17	47.4	+7	13	6	IC 1112	E. Swift	GX	14.1	1.0′ × 0.6′	PGC 54604
S9–49	1890 Jun 19	15	16	40	+8	50.0		eeF; S; R. Edward.	15	21	55.3	+8	25	26	IC 1116	E. Swift	GX	12.8	1.1′ × 0.7′	PGC 54848

S9–50	1890 Jun 19	15	22	20	+7	12.0		eeeF; eS; stellar; vF * close p. Edward.	15	27	44.1	+6	48	14	IC 1121	E. Swift	GX	14.3	0.4′ × 0.4′	PGC 55152
S9–51	1890 Apr 19	15	43	5	+8	55.3		vF; S; R; 9 m. * close np.	15	48	32.6	+8	35	17	IC 1137	L. Swift	GX	14.5	0.4′ × 0.3′	PGC 2816978
S9–52	1890 Sep 7	15	47	43	+43	46.6		eeeF; vS; R; 9 m. * sf.	15	51	21.7	+43	25	4	IC 1144	L. Swift	GX	13.6	0.7′ × 0.5′	PGC 56216
S9–53	1887 Jun 19	16	2	24	+14	14.8		eeF; vS; R; D * f points to it; sp of 2.	16	7	23.0	+13	53	17	NGC 6065	L. Swift	GX	13.8	0.7′ × 0.7′	PGC 57215*
S9–54	1887 Jun 19	16	2	30	+14	11.5		eeF; vS; R; 2 pB st. nr. s both D; nf of 2.	16	7	35.3	+13	56	38	NGC 6066	L. Swift	GX	14	0.7′ × 0.6′	PGC 57230*
S9–55	1890 Jun 28	16	5	20	+10	19.8		eeF; S; E; p. DM. +10.2969°, 9 sec.; ee diff. in consequence of proximity to the star. Found searching for D'Arrest Comet.	16	10	34.3	+10	2	26	IC 1199	L. Swift	GX	13.7	1.3′ × 0.5′	PGC 57373
S9–56	1887 Jun 24	16	8	45	+52	44.7		vF; S; R.	16	11	40.3	+52	27	21	NGC 6090	L. Swift	GX	13.8	1.3′ × 0.5′	PGC 57437
S9–57	1887 May 31	16	13	0	+63	32.6		vF; pS; lE; D * nr. s points to it.	16	14	22.2	+63	15	40	NGC 6111	L. Swift	GX	13.5	0.7′ × 0.6′	PGC 57579

(continued)

Catalog 9 (Warner observatory)

				Equinox 1890.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S9–58	1888 Jun 7	16	13	2	+62	49.0		vF; vS; lE; r.	16	14	30.1	+62	32	12	IC 1210	L. Swift	GX	13.1	1.5′ × 0.4′	PGC 57589
S9–59	1887 Jun 19	16	14	15	+14	24.8		eF; S; R.	16	19	10.6	+14	8	1	NGC 6113	L. Swift	GX	13.8	0.9′ × 0.4′	PGC 57807
S9–60	1889 Jun 22	16	14	30	+64	29.8		eeF; pS; R; 3 st. in a line n, most distant D.	16	15	30.8	+64	13	30	IC 1212	L. Swift	GX	14.6	0.5′ × 0.5′	PGC 57633
S9–61	1890 Apr 19	16	16	20	−1	15.8		F; vS; R.	16	22	10.3	−1	30	53	IC 1213 = NGC 6172	E. Stephan (1884)	GX	12.8	1.0′ × 1.0′	PGC 57937
S9–62	1889 Jul 24	16	37	0	+67	51.2		eeeF; vS; 2 or 3 vF st. inv.; * nr. p.	16	36	52.4	+67	37	45	IC 1225	L. Swift	GX	14.4	1.4′ × 0.4′	PGC 58607
S9–63	1887 Jun 25	16	39	10	+58	1.0		vF; pS; R; sp of 2.	16	41	27.6	+57	47	1	NGC 6211	L. Swift	GX	12.6	1.6′ × 1.2′	PGC 58775
S9–64	1887 Jun 25	16	39	25	+58	2.3		eF; vS; R; nf of 2.	16	41	37.2	+57	48	53	NGC 6213	L. Swift	GX	14.7	0.7′ × 0.3′	PGC 58778
S9–65	1887 Jun 19	16	41	40	−0	3.6		eeF; pS; iR; 3 F st. s point to it.	16	47	13.3	−0	16	31	NGC 6220	L. Swift	GX	13.7	1.7′ × 0.9′	PGC 58979

S9–66	1887 Jun 15	16	43	5	+6	31.0		eeeF; vS; lE; pB * nr. n both in trap.; eee diff.; np of 2.	16	48	18.6	+6	18	44	NGC 6224	L. Swift	GX	13.5	0.9′ × 0.9′	PGC 59017
S9–67	1887 Jun 15	16	43	7	+6	25.5		eF; vS; l E; 2 or 3 vF st. inv.; sf of 2.	16	48	21.6	+6	13	22	NGC 6225	L. Swift	GX	13.8	0.9′ × 0.6′	PGC 59024
S9–68	1889 Jun 22	16	45	10	+58	38.0		eeeF; L; R; evenly B; pB * sp.	16	46	59.0	+58	25	23	IC 1231	L. Swift	GX	13.2	2.4′ × 1.0′	PGC 58973
S9–69	1890 Jul 11	16	46	?	+46	16.7		eeeF; S; iR; B * with distant companion nr. sf. Driving clock failed.	16	49	48.5	+46	43	5	IC 1232	L. Swift	GX	14.3	0.7′ × 0.4′	PGC 59072*
S9–70	1889 Jul 24	16	47	25	+63	20.2		eF; vS; vE; bet. 2 st.	16	48	20.2	+62	58	35	IC 1233 = NGC 6247	H. d′Arrest (1862)	GX	12.9	1.0′ × 0.3′	PGC 59023*
S9–71	1890 Jun 23	16	54	0	+55	13.3		eF; pL; l E; * nr. p.	16	56	16.1	+55	1	35	IC 1237	L. Swift	GX	13.6	1.5′ × 0.7′	PGC 59280
S9–72	1890 May 15	17	5	25	+10	55.7		pF; pS; vE; r.	17	10	24.0	+10	47	15	IC 1243	L. Swift	AST			Asterism*
S9–73	1889 Sep 15	17	6	40	+36	20.5		pF; pS; R; bet. 2 st.	17	10	33.6	+36	18	13	IC 1244	L. Swift	GX	13.7	1.0′ × 1.0′	PGC 59746*
S9–74	1887 Apr 21	17	7	30	+48	29.9		eeF; vS; F * close each side in meridian.	17	10	20.8	+48	19	54	NGC 6313	L. Swift	GX	13.8	1.3′ × 0.4′	PGC 59739

(continued)

Catalog 9 (Warner observatory)

				Equinox 1890.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S9–75	1889 Sep 15	17	8	45	+38	10.0		eF; S; R; BM; F * close s; 3 or 4 other nr. n.	17	12	36.6	+38	1	13	IC 1245	L. Swift	GX	13.7	1.7′ × 0.8′	PGC 59835
S9–76	1889 Sep 15	17	11	0	+35	40.0		eeeF; pS; R; eee diff.; 4 pB st. nr. in line s.	17	14	55.0	+35	31	14	IC 1249	L. Swift	GX	13.8	0.7′ × 0.6′	PGC 59919
S9–77	1890 Jun 23	17	12	35	+57	32.8		pF; S; cE.	17	14	29.2	+57	25	0	IC 1250	L. Swift	GX	15.2	0.6′ × 0.3′	PGC 2565010
S9–78	1887 Apr 21	17	13	40	+40	59.6		vF; L; iR; sp of 2.	17	17	6.5	+40	50	42	NGC 6339	L. Swift	GX	12.7	2.9′ × 1.7′	PGC 60003
S9–79	1887 Apr 21	17	13	55	+41	11.6		vF; S; lE; nf. of 2.	17	17	16.3	+41	3	10	NGC 6343	L. Swift	GX	13.5	1.1′ × 1.1′	PGC 60010
S9–80	1890 May 15	17	25	45	+58	34.3		eeeF; S; R; forms equilatoral triangle with two others, 3rd of 3.	17	27	31.7	+58	28	33	IC 1260	L. Swift	GX	14.9	0.4′ × 0.3′	PGC 60324

S9–81	1890 Jun 15	17	28	48	+59	43.5		eeF; pS; cE; B * nearly obscures it; bet. it and a F * nearer the latter.	17	30	21.4	+59	38	24	NGC 6394	L. Swift	GX	14.5	1.3′ × 0.4′	PGC 60410*
S9–82	1890 Jun 19	17	29	45	+43	51.0		eF; pS; R; 1st of 3.	17	33	2.0	+43	45	35	IC 1262	L. Swift	GX	13.7	1.2′ × 0.6′	PGC 60479
S9–83	1890 Jun 19	17	29	50	+43	54.0		eF; pS; R; 2nd of 3.	17	33	7.2	+43	49	20	IC 1263	L. Swift	GX	13.7	1.7′ × 0.7′	PGC 60481
S9–84	1890 Jun 19	17	30	0	+43	43.5		eeeF; pS; R; 3rd of 3; eee diff.	17	33	16.9	+43	37	46	IC 1264	L. Swift	GX	14.4	1.2′ × 1.1′	PGC 60484
S9–85	1890 Jul 10	17	33	17	+42	10.3		eeF; S; lE.	17	36	39.5	+42	5	18	IC 1265	L. Swift	GX	12.3	2.0′ × 0.9′	PGC 60568
S9–86	1887 Jun 15	17	39	30	+62	42.8		eeF; vS; R; vF D * nr. f.	17	40	11.1	+62	38	31	NGC 6435	L. Swift	GX	13.7	1.1′ × 0.6′	PGC 60667
S9–87	1887 May 25	18	8	50	+39	39.3		eeeF; pS; E; eee diff.; bet. several B st. Edward.	18	12	21.8	+39	37	59	NGC 6585	E. Swift	GX	12.8	1.9′ × 0.4′	PGC 61553
S9–88	1887 May 29	18	30	0	+40	1.4		eeeF; pS; R; eee diff., nearly in finder field with Alpha Lyrae. Edward.	18	33	33.7	+40	2	56	NGC 6663	E. Swift	GX	13.9	1.0′ × 0.9′	PGC 62032
S9–89	1887 May 25	18	30	43	+33	30.0		eF; S; R. Edward.	18	34	45	+33	35.2		NGC 6666	E. Swift				Missing

(continued)

Catalog 9 (Warner observatory)

				Equinox 1890.0							Equinox 2000.0									
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S9–90	1887 Jun 24	18	33	40	+67	1.3		An e close D with [NGC] 6679; suspected with 132, confirmed with 200; perfectly separated with 250.	18	33	36.1	+67	6	38	NGC 6677	L. Swift	GX	12.8	0.9′ × 0.4′	PGC 62035
S9–91	1887 May 29	18	36	16	+39	56.4		eeF; vS; R; e diff.; sp of 2; in finder field with Epsilon Lyrae. Edward.	18	39	58.7	+39	58	54	NGC 6685	E. Swift	GX	13.4	1.1′ × 0.9′	PGC 62220
S9–92	1887 May 29	18	36	20	+40	5.4		eeeF; eS; R; eee diff.; nf of 2; in finder field with Epsilon Lyrae. Edward.	18	40	7.0	+40	8	15	NGC 6686	E. Swift	GX	14.2	0.9′ × 0.8′	PGC 62224
S9–93	1890 Apr 15	19	23	45	+49	4.0		eeF; vS; R; 2 B and 1 F * in line nr. f, nearest * nf close D with 300.	19	26	32.0	+50	7	31	IC 1301 = IC 4867	L. Swift	GX	13.2	1.0′ × 0.4′	PGC 63207*

S9–94	1887 Jun 26	20	21	20	+58	1.0		eeF; pS; F * close p; 2 single and 2 D st. in line n point to it.	20	23	33.1	+58	20	39	NGC 6916	L. Swift	GX	13.5	2.0′ × 1.4′	PGC 64600
S9–95	1889 Sep 23	20	38	35	+15	11.5		eeeF; pL; R; in center of trap. of 4 st. eee diff.; in finder field with Gamma and Delta Delphini.	20	43	42.7	+15	35	16	IC 1329	L. Swift	AST			Asterism*
S9–96	1889 Sep 11	21	3	25	+12	2.0		eeF; eS; stellar; eF * attached.	21	8	43.0	+12	29	3	IC 1359	L. Swift	GX	13.7	1.1′ × 0.3′	PGC 66189
S9–97	1889 Sep 18	21	57	0	+19	13.2		eeF; pS; R; bet. 2 nr. F st. in meridian.	22	2	31.7	+19	45	2	IC 1420	L. Swift	GX	13.1	1.4′ × 1.3′	PGC 67900
S9–98	1889 Oct 20	22	52	55	+14	25.6		eeeF; vS; R.	22	58	34.3	+15	10	22	IC 1461	L. Swift	GX	14.2	0.6′ × 0.4′	PGC 70153
S9–99	1887 Oct 15	23	19	5	+14	2.1		eeeF; pS; iR; 8 m. * f; F * nr. nf; not [GC] 4659.	23	24	20.1	+14	38	49	IC 1487 = NGC 7649	L. Swift	GX	14.0	1.3′ × 0.9′	PGC 71343*
S9–100	1887 Aug 19	23	54	25	+46	15.8		eF; pS; R; D * points to it.	23	59	15.8	+46	53	21	IC 1525	L. Swift	GX	12.2	1.9′ × 1.4′	PGC 73150

Catalog 10 (Warner observatory)

				Equinox 1890.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S10–1	1890 Nov 12	0	36	40	+0	16.4		eF; S; R; bet. 2 st.	0	42	15.9	+0	50	43	IC 44 = NGC 223	G. Bond (1853)	GX	13.2	1.3′ × 0.9′	PGC 2527*
S10–2	1890 Sep 18	0	38	15	+1	15.3		eeeF; pS; R; eee diff. Faintest object ever seen here.	0	43	56.2	+1	51	1	IC 49	L. Swift	GX	13.5	1.9′ × 1.7′	PGC 2617
S10–3	1890 Sep 25	0	44	45	+10	1.2		eeeF; pS; R; B * in field s. Others suspected.	0	50	40.8	+10	36	1	IC 53	L. Swift	GX	13.9	1.5′ × 1.4′	PGC 2951
S10–4	1890 Sep 25	0	54	25	+47	5.6		eF; pL; vE; 2 B st. in field, one f. the other s.	1	0	55.4	+47	40	55	IC 65	L. Swift	GX	12.8	3.9′ × 1.1′	PGC 3635
S10–5	1890 Sep 18	1	19	14	+14	18.3		vF; vS; R; * close p.	1	25	24.7	+14	51	53	IC 107 = IC 1700	L. Swift	GX	13.3	2.0′ × 2.0′	PGC 5271
S10–6	1890 Sep 30	1	36	30	+13	5.5		eeeF; pS; v diff; np of [NGC] 660.	1	42	27.0	+13	58	37	IC 148	L. Swift	GX	13.2	3.5′ × 1.1′	PGC 6292*
S10–7	1890 Aug 11	1	38	5	+12	39.0		eF; pS; np of 2.	1	49	0.0	+13	12	41	IC 151	L. Swift	GX	13.5	1.2′ × 0.8′	PGC 6657*
S10–8	1890 Aug 11	1	38	15	+12	29.0		eF; S; R; vF * close; sf of 2.	1	49	14.1	+13	3	19	IC 152 = NGC 677	L. Swift	GX	12.2	2.0′ × 2.0′	NGC 677*

S10–9	1890 Sep 25	1	38	45	+12	4.5		eF; pS; R; sp of 2.	1	48	33.1	+12	36	50	IC 153	L. Swift	GX	13.0	0.9′ × 0.7′	PGC 6633*
S10–10	1890 Sep 25	1	39	50	+12	19.3		eeeF; S; R; D * and wide D * p; nf of 2.	1	49	11.7	+12	51	12	IC 157	L. Swift	GX	14.2	1.2′ × 0.3′	PGC 6670*
S10–11	1891 Jan 8	1	42	55	+9	48.7		eeeF; vS; R.	1	48	53.5	+10	31	18	IC 162	L. Swift	GX	12.7	1.4′ × 1.4′	PGC 6643*
S10–12	1891 Jan 7	1	42	58	+9	58.8		eeF; pS; R.	1	48	43.9	+10	30	27	IC 161	L. Swift	GX	13.8	0.7′ × 0.5′	PGC 6644*
S10–13	1890 Jun 28	1	53	30	+37	30.0		pB; S; lE; 9 m * nr. nf.	2	0	11.5	+38	1	17	IC 179	L. Swift	GX	12.6	1.8′ × 1.5′	PGC 7581
S10–14	1891 Dec 25	4	6	41	+27	25.0		eeF; pL; R; Not no. 29 cat. 2. That is still missing.	4	12	28.3	+27	42	7	IC 359	L. Swift	GX	13.9	1.3′ × 1.3′	PGC 14653*
S10–15	1891 Jan 7	5	48	0	−17	53.8		eeF; pS; E in meridian; wide D * nr. p.	5	53	0.1	−17	52	34	IC 438	L. Swift	GX	12.0	2.8′ × 2.1′	PGC 18047*
S10–16	1890 Dec 19	6	56	0	−30	1.0		vF; pS; R; B * p close nf; B * with pB distant com. np.	7	0	17.5	−30	9	50	IC 456	L. Swift	GX	12.0	2.1′ × 1.3′	PGC 19993
S10–17	1891 Oct 2	7	15	30	+46	17.0		eF; eS; stellar.	7	23	29.4	+46	4	36	IC 470	L. Swift	AST			Asterism
S10–18	1891 Mar 29	10	55	0	+11	1.8		eeF; pS; R; triangle with 2 F st. s; 1st of 3; [NGC] 3492 in field. Edward.	11	0	37.3	+10	26	14	IC 663	E. Swift	GX	14.6	0.8′ × 0.6′	PGC 33182

(continued)

Catalog 10 (Warner observatory)

				Equinox 1890.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S10–19	1891 Mar 29	10	55	5	+11	9.8		eF; pS; R; 2nd of 3; [NGC] 3492 near. Edward.	11	0	45.4	+10	33	12	IC 664	E. Swift	GX	13.0	1.5′ × 1.1′	PGC 33191
S10–20	1891 Apr 8	11	7	0	+9	39.8		vF; pS; lE; bet. 2 distant stars. Edward.	11	12	39.8	+9	3	21	IC 676	E. Swift	GX	11.8	2.1′ × 1.3′	PGC 34107
S10–21	1891 Apr 28	13	12	40	+6	56.2		eeF; pS; R; lbM; 1st of 5; [NGC] 5060 in field = 2nd of 5; ee diff.	13	17	1.6	+6	21	26	IC 872	L. Swift	GX	13.9	1.3′ × 1.0′	PGC 46250*
S10–22	1891 Apr 28	13	13	25	+6	39.7		eeeF; pS; pB * f 13 s; 3rd of 5.	13	18	58	+6	5.0		IC 877	L. Swift				Missing
S10–23	1891 Apr 28	13	13	28	+6	42.0		eeeF; pL; 4th of 5; eee diff.	13	19	1	+6	7.3		IC 878	L. Swift				Missing
S10–24	1891 Apr 28	13	13	35	+6	41.5		eeeF; pS; E in meridian; pB * nr. s; 5th of 5; eee diff.	13	19	8	+6	6.8		IC 880	L. Swift				Missing
S10–25	1891 May 3	14	4	0	+15	21.9		eeF; pS; R; e diff.	14	9	32.4	+14	49	54	IC 979	L. Swift	GX	13.5	1.1′ × 0.7′	PGC 50530

S10–26	1891 Apr 28	14	23	20	+5	19.2		vF; vS; R; f of [NGC] 5619.	14	27	32.4	+4	49	17	IC 1016 = IC 4424 = NGC 5619B	L. Swift	GX	14.1	0.9′ × 0.3′	PGC 51624*
S10–27	1891 Jun 25	14	48	40	+5	10.0		eF; S; R; BM.	14	54	12.5	+4	45	1	IC 1071	L. Swift	GX	13.2	1.0′ × 0.8′	PGC 53260
S10–28	Uncertain	15	5	?	+5	?		eeF; p S; p of close double. Lost before measured. Edward.	15	10	?	+5	?	?		E. Swift				Missing
S10–29	Uncertain	15	5	?	+5	?		eeF; pS; f of close double. Lost before measured. Edward.	15	10	?	+5	?	?		E. Swift				Missing
S10–30	1891 Jun 24	15	5	40	+4	41.1		eeeF; vS; F * with distant com. nr. sf; eee diff.	15	11	5.0	+4	17	39	IC 1102	L. Swift	GX	14.2	1.1′ × 0.6′	PGC 54188
S10–31	1891 Jun 24	15	7	50	+4	40.6		eeF; S; lE; F * nr np; 3 distant st. in a curve sf.	15	13	13.9	+4	17	15	IC 1105	L. Swift	GX	13.7	0.9′ × 0.4′	PGC 54338
S10–32	1891 Jun 25	15	11	35	+5	38.5		eeeF; pS; R; * nr nf; eee diff.	15	17	4.0	+5	15	22	IC 1109	L. Swift	GX	14.2	0.4′ × 0.4′	PGC 54549
S10–33	1890 Jul 17	15	56	5	+2	1.3		eeF; pL; iR.	16	1	34.1	+1	42	28	IC 1158	E. E. Barnard (1890)	GX	12.6	2.5′ × 1.7′	PGC 56723*
S10–34	1890 Jul 21	16	24	6	+8	42.0		eeF; pS; E.	16	29	38.3	+8	27	2	IC 1220	E. E. Barnard (1890)	GX	13.7	0.9′ × 0.9′	PGC 58340*

(continued)

Catalog 10 (Warner observatory)

				Equinox 1890.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S10–35	1890 Jul 10	16	31	31	+46	38.3		eeF; pS; E; p of 2.	16	34	41.6	+46	23	32	IC 1221	L. Swift	GX	13.8	1.3′ × 1.1′	PGC 58528
S10–36	1890 Jul 10	16	31	50	+46	27.3		eeF; pL; R; f of 2.	16	35	9.2	+46	12	50	IC 1222	L. Swift	GX	13.4	1.7′ × 1.3′	PGC 58544
S10–37	1890 Jul 11	16	32	25	+49	29.3		eeeF; pS; R; bet. 2 distant F st; B * with very dist. com. s.	16	35	42.5	+49	13	14	IC 1223	L. Swift	GX	14.3	0.8′ × 0.6′	PGC 58567
S10–38	1890 Jul 11	16	37	55	+46	13.3		eF; S; R; Forms arc of circle with 4 stars.	16	41	6.6	+46	0	14	IC 1226	L. Swift	GX	14.3	0.4′ × 0.3′	PGC 58754
S10–39	1890 Sep 13	16	41	38	+65	47.5		vF; pS * nr. n; 4 st. in curve s.	16	42	6.5	+65	35	8	IC 1228	L. Swift	GX	13.4	1.6′ × 1.5′	PGC 58804
S10–40	1890 Sep 18	16	42	15	+51	29.5		eeeF; pS; another nr. s; D * in field n; others susp.; np of 2; ee diff.	16	44	58.8	+51	18	29	IC 1229	L. Swift	GX	15.0	0.4 × 0.3′	PGC 58902
S10–41	1890 Sep 18	16	42	33	+51	25.5		eeeF; S; R; D * in field n; sf of 2; eee diff.	16	45	1.6	+51	15	37	IC 1230	L. Swift	GX	14.6	0.9′ × 0.9′	PGC 58903

S10–42	1890 Sep 17	16	53	50	+20	13.0		eF; pS; lE; B * nr. n; vF * close p.	16	58	29.6	+20	2	29	IC 1236	T. Safford (1866)	GX	13.6	1.1′ × 0.9′	PGC 59350
S10–43	1890 Sep 18	17	12	16	+72	33.0		eeeF; pS; R; 6340 nr; sp. [should be np] of 2; ee diff. Edward.	17	10	13.2	+72	24	39	IC 1251	E. Swift	GX	13.5	1.4′ × 1.0′	PGC 59735
S10–44	1890 Sep 18	17	13	48	+72	33.5		eeeF; pS; R; nf [should be sf] of 2; ee diff. Edward.	17	11	33.3	+72	24	7	IC 1254	E. Swift	GX	13.8	1.6′ × 0.7′	PGC 59783
S10–45	1891 Jun 5	17	18	0	+12	46.0		vF; pS; R; Trapezium with 3 stars.	17	23	5.4	+12	41	44	IC 1255	L. Swift	GX	13.4	1.1′ × 0.5′	PGC 60180
S10–46	1891 Jun 5	18	30	50	+49	14.0		eF; vS; R; F * close n.	18	33	52.6	+49	16	43	IC 1291	L. Swift	GX	13.0	1.8′ × 1.5′	PGC 62049
S10–47	1891 Oct 2	19	21	25	+52	26.0		eF; vS; R.	19	24	3.2	+53	37	29	IC 1300 = NGC 6798	L. Swift	GX	13.2	1.6′ × 0.9′	PGC 63171*
S10–48	1891 Sep 28	21	8	25	+2	6.0		eeeF; S; R; eee diff.; Found searching for Comet Tempel-Swift. Edward.	21	13	55.9	+2	33	56	IC 1365	E. Swift	GX	13.7	1.1′ × 0.7′	PGC 66381
S10–49	1891 Sep 28	21	8	40	+1	42.5		eeeF; S; R; eee diff.; Found searching for Comet Tempel-Swift. Edward.	21	14	12.6	+2	10	41	IC 1368	E. Swift	GX	13.4	1.2′ × 0.5′	PGC 66389

(continued)

Catalog 10 (Warner observatory)

				Equinox 1890.0							Equinox 2000.0							
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S10–50	1891 Sep 8	21	24	15	−1	8.8		eF; vS; v wide D * nr nf.	21	29	52.2	−0	37	52	IC 1388	L. Swift	GX	14.2	0.4′ × 0.2′	PGC 66857
S10–51	1891 Sep 29	22	24	30	−5	42.5		eeeF; pS; R; Munich2 12,516 3′ n; Found searching for Comet Tempel-Swift. Edward	22	29	59.8	−5	7	12	IC 1447	E. Swift	GX	12.8	1.4′ × 0.8′	PGC 68996
S10–52	1891 Nov 5	23	23	23	−4	44.3		eF; pS; R; vF * close n; 6 pB = Mag. st. p.	23	59	10.7	−4	7	38	IC 1490 = IC 1524	T. Safford (1867)	GX	14.5	1.7′ × 0.7′	PGC 73151
S10–53	1891 Oct 17	23	24	56	−3	38.5		eF; S; R; sp. of 2. Edward.	23	30	36.1	−3	2	24	IC 1492	E. Swift	GX	13.1	1.3′ × 1.1′	PGC 71629
S10–54	1891 Oct 17	23	25	5	−3	33.0		eeF; pS; R; nf of 2. Edward.	23	30	53.5	−2	56	4	IC 1496	N. M. Parrish (1890)	GX	13.2	1.7′ × 1.3′	PGC 71634

S10–55	1891 Nov 5	23	26	12	−5	36.3		eeF; pS; R; 9 1/2 * p 36 s, s 3′ 15″; D * s points to 11 m * f. neb. 7 s; another 11 m * f. neb 14 s; not 7962; seeing poor; could not find 7962.	23	31	53.7	−5	0	25	IC 1498	L. Swift	GX	13.7	2.3′ × 0.6′	PGC 71677
S10–56	1891 Oct 15	23	31	45	+75	2.8		vF; S; vF * close.	23	36	20.7	+75	38	53	IC 1502	L. Swift	GX	13.6	1.2′ × 0.5′	PGC 71864
S10–57	1891 Nov 12	23	35	45	−4	10.3		eeeF; pS; R; 3 pB st. f. and 4 or 5 st. p; ee diff.	23	41	37.1	−3	33	54	IC 1505	L. Swift	GX	13.5	0.9′ × 0.7′	PGC 72133
S10–58	1891 Nov 12	23	50	23	−1	36.0		eeeF; pS; 9 1/2 m * inv.; B * nf. and pF * sp; sp of 2; eee diff.	23	56	3.9	−0	59	18	IC 1515	L. Swift	GX	13.5	1.1′ × 0.9′	PGC 72922
S10–59	1891 Nov 12	23	50	25	−1	31.3		vF; pS; R; B * nr sf; nf of 2.	23	56	7.1	−0	54	59	IC 1516	E. E. Barnard (1889)	GX	13.1	1.3′ × 1.2′	PGC 72927*
S10–60	1891 Nov 12	23	50	38	−0	55.2		eeeF; vS; R; 3 st. in a curve p.	23	56	18.8	−0	18	21	IC 1517	L. Swift	GX	13.8	0.6′ × 0.5′	PGC 72942

Catalog 10A (Warner observatory)

				Equinox 1890.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S10A-1	1892 Mar 28	9	35	50	+12	56.0		eeF; eS, almost stellar	9	41	56.9	+12	17	47	IC 554 = IC 555	S. Javelle (1892)	GX	13.3	1.2′ × 0.6′	PGC 27716*
S10A-2	1892 Apr 16	10	55	35	+11	3.2		eeF, vS, ee diff. N.G.C. 3492 near. 4th of 4	11	1	14.8	+10	28	52	IC 666	S. Javelle (1892)	GX	14.4	0.5′ × 0.3′	PGC 33232
S10A − 3	1892 Apr 18	11	22	30	+59	9.2		vS, close D with [NGC] 3690 = H 247.1 suspected with 132, ver. with 200.	11	28	27.3	+58	34	43	IC 694	B. Stoney (1852)	GX	15.8	0.3′ × 0.25′	PGC 35325
S10A − 4	1892 May 16	14	14	12	−3	58.4		pF, S, R, star with distant companion near n. p of 2	14	19	59.2	−4	27	4	IC 997	L. Swift	GX	12.8	1.3′ × 0.8′	PGC 51220*
S10A-5	1892 May 16	14	14	30	-3	57.4		eeF, S, R, e diff. f of 2	14	20	19.3	−4	24	59	IC 998	L. Swift	GX	15.0	0.9′ × 0.3′	PGC 1058483*

S10A-6	1892 May 17	14	34	50	+3	50.0		eF, vS, little elongated 1st of 3	14	40	29.4	+3	25	58	IC 1039	S. Javelle (1891)	GX	14.7	0.6′ × 0.3′	PGC 52428*
S10A-7	1892 May 17	14	35	4	+3	56.0		eeF, S, R, close D with [NGC] 5718	14	40	39.0	+3	28	11	IC 1042	S. Javelle (1891)	GX	13.3	1.1′ × 1.0′	PGC 52433*
S10A-8	1892 Jun 16	15	52	50	+12	23.8		eeF, pS, R, in centre of rhombus of 4 stars, v diff.	15	58	8.0	+12	4	13	IC 1149	L. Swift	GX	13.3	1.1′ × 0.9′	PGC 56511*

Catalog 11 (Lowe observatory)

				Equinox 1900.0							Equinox 2000.0								
Swift object no.	Date of Discdisc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S11–1	1896 Sep 12	0	1	40	-4	19.2		pB; vS; vE	0	6	28.4	−3	42	58	IC 5386 = NGC 7832	W. Herschel (1784)	GX	13.2	1.9′ × 1.0′	PGC 485
S11–2	1897 Sep 23	0	11	0	−39	52.2		eeeF; vL; eE; close f NGC 55; f or 2; Note.	0	15	50.0	−39	15	49	IC 1537	L. Swift		15.0	0.5′	PGC 1050*
S11–3	1895 Dec 8	0	18	3	+6	25.4		eeF; unequal D * f 46 s same parallel	0	22	49.9	+6	57	52	IC 1549	L. Swift	GX	13.8	0.8′ × 0.8′	PGC 1464
S11–4	1895 Sep 10	0	30	0	−10	7.0		eeeF; pS; R; ee dif.	0	34	58.0	−9	20	32	IC 1556	L. Swift	GX	13.4	0.9′ × 0.7′	PGC 2100*
S11–5	1896 Sep 5	0	38	30	−4	41.9		eeF; S; R; 10 m * close s; not 239	0	43	33.3	−4	7	5	IC 1575	L. Swift	GX	13.5	0.8′ × 0.7′	PGC 2601
S11–6	1897 Aug 1	0	46	45	−35	0.5		eF; eeS; R; with 132 and 200 looks like a nebulous D Uranus; Note.	0	51	59.5	−34	25	19	IC 1589	L. Swift	AST			Double star*
S11–7	1895 Sep 14	0	53	22	−12	43.2		eeF; pS; nearly bet a 7 m * p; and a 9 m * nf; near th latter	0	58	22	−12	10.8		IC 1606	L. Swift				Missing
S11–8	1897 Oct 3	0	54	30	−34	51.5		pB; pS; R; 2 st nf; and 2 np.	0	59	24.3	−34	19	44	IC 1608	L. Swift	GX	12.4	2.0′ × 0.7′	PGC 3549

S11–9	1897 Sep 4	0	55	0	−40	53.9		vF; vS; R.	0	59	46.6	−40	20	1	IC 1609	L. Swift	GX	12.6	1.4′ × 1.4′	PGC 3567
S11–10	1895 Dec 13	0	56	40	−16	9.1		pF; S; R; 9 m * nearly in contact np.	1	1	42.6	−15	34	4	IC 1610	L. Swift	GX	12.9	1.4′ × 1.0′	PGC 3681
S11–11	1897 Nov 19	1	2	37	−18	2.5		vF; S; R; np of 2	1	7	36.7	−17	32	19	IC 1622	L. Swift	GX	13.7	0.7′ × 0.5′	PGC 3997
S11–12	1897 Nov 19	1	2	45	−18	0.5		B; CS; lE; sf of 2	1	7	47.2	−17	30	25	IC 1623	L. Swift	GX	13.9	0.7′ × 0.6′	PGC 4007
S11–13	1897 Sep 29	1	5	6	−46	31.6		vF; S; R; no B * near, vF one f.	1	9	55.6	−45	55	52	IC 1633	J. Dunlop (1826)	GX	11.5	2.6′ × 2.4′	PGC 4149
S11–14	1897 Sep 4	1	9	45	−33	11.6		eeF; S; eeE; a ray; no * near.	1	14	7.0	−32	39	3	IC 1657 = IC 1663	L. Swift	GX	12.4	2.3′ × 0.5′	PGC 4440*
S11–15	1897 Oct 30	1	11	24	−31	11.4		eeF; vE, 350°; 5 st sf have distant companions	1	14	7.0	−32	39	3	IC 1663 - IC 1657	L. Swift	GX	12.4	2.3′ × 0.5′	PGC 4440*
S11–16	1896 Oct 6	1	12	45	−17	38.3		eF; pS; R; no * near; 8 m * in field nf	1	18	42.4	−17	3	1	IC 1667	L. Swift	GX	13.6	1.0′ × 0.9′	PGC 4694
S11–17	1895 Dec 18	1	14	20	−17	22.5		vF; pS; lE; wide D * near nf; f of 2	1	18	50.9	−16	48	13	IC 1670	L. Swift	GX	13.6	1.4′ × 0.4′	PGC 4707/4711*
S11–18	1895 Dec 18	1	14	40	−17	37.4		eeF; vS; R; p 7 m * nf; 47 s; p of 2	1	19	2.3	−17	3	37	IC 1671 = IC 93	L. Swift	GX	13.2	1.3′ × 0.5′	PGC 4724*
S11–19	1897 Nov 26	1	19	45	+8	12.9		eF; pS; R; 10 m * att p; * with distant companion sf another np	1	25	7.6	+8	41	58	IC 1695	L. Swift	GX	14.0	0.7′ × 0.7′	PGC 5245

(continued)

Catalog 11 (Lowe observatory)

				Equinox 1900.0							Equinox 2000.0									
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S11–20	1896 Oct 12	1	20	30	+16	4.7		eeeF; pS; lE; bet 2 st in meridian; wide D* nf; e e diff.	1	25	56.3	+16	36	7	IC 1702	L. Swift	GX	13.5	1.5′ × 1.2′	PGC 5321
S11–21	1897 Sep 4	1	23	35	−36	17.0		eeF; pS; R; v diff.	1	27	57.0	−35	43	4	IC 1709 = NGC 568	J. Herschel (1837)	GX	12.6	2.2′ × 1.4′	PGC 5468
S11–22	1897 Sep 4	1	33	10	−34	29.7		vF; S; R; eF; * near nf	1	37	35.9	−33	55	27	IC 1719	L. Swift	GX	12.6	1.6′ × 1.2′	PGC 6020
S11–23	1897 Oct 30	1	35	29	−29	26.3		eeF; eS; R; B * in margin of field p	1	40	21.6	−28	54	46	IC 1720	L. Swift	GX	12.9	1.5′ × 1.1′	PGC 6180
S11–24	1896 Oct 8	1	43	10	−27	26.7		pB; eeS; almost stellar; In vacancy	1	47	55.3	−26	53	32	IC 1729	L. Swift	GX	12.6	1.7′ × 0.9′	PGC 6598
S11–25	1897 Nov 17	1	44	23	−33	16.3		eeF; pS; R; 2 F st p point to it	1	49	17.0	−32	44	34	IC 1734	L. Swift	GX	12.8	1.6′ × 1.4′	PGC 6679
S11–26	1895 Dec 8	1	46	45	−10	20.0		eeF; vS; GC. 418 [NGC 701] p	1	51	7.9	−9	47	31	IC 1738	L. Swift	GX	13.9	0.9′ × 0.7′	PGC 6832
S11–27	1897 Sep 6	1	46	45	−30	26.3		pB; eS; lE; like a D nebulous *. See note	1	48	51.6	−30	5	12	IC 1740	L. Swift				double star*
S11–28	1897 Nov 26	1	50	45	+5	11.2		pF; pS; R; 9 m * near np	1	56	21.0	+5	37	44	IC 1751 = NGC 741	W. Herschel (1784)	GX	11.1	3.0′ × 3.0′	PGC 7252

S11–29	1897 Sep 29	1	53	4	−33	31.5		pB; vS; R; BM; 10 m * v close sp.	1	57	55.4	−32	59	13	IC 1759 = IC 1760	L. Swift	GX	12.9	1.5′ × 1.4′	PGC 7400*
S11–30	1897 Nov 17	1	53	5	−32	29.7		eF; pS; R; Cordoba 681 sp	1	57	55.4	−32	59	13	IC 1760 = IC 1759	L. Swift	GX	12.9	1.5′ × 1.4′	PGC 7400*
S11–31	1897 Sep 6	1	53	45	−33	46.7		eeeF; pS; R; 7 m * in field nf; another susp.	1	57	48.6	−33	14	23	IC 1762	L. Swift	GX	13.5	1.8′ × 0.4′	PGC 7393
S11–32	1896 Dec 18	1	55	5	−11	36.4		eeF; pS; bet the 2 southern of 4 st of trapezium	1	59	59.4	−11	4	44	IC 1767	L. Swift	GX	13.6	1.8′ × 0.7′	PGC 7568
S11–33	1896 Oct 18	1	56	8	−25	34.7		eeeF; pS; R; 3 9 m st sf near form equilateral triangle; ee diff.	2	0	49.9	−25	1	36	IC 1768	L. Swift	GX	13.0	0.7′ × 0.6′	PGC 7636
S11–34	1896 Oct 8	2	2	55	−25	57.5		vF; D * of = mag in nebulosity; Curious object; Note	2	7	20.0	−25	26	31	IC 1782 = NGC 823	J. Herschel (1830)	GX	12.6	1.8′ × 1.3′	PGC 8093*
S11–35	1897 Dec 29	2	5	30	−33	29.7		vF; vS; eE; nearly o°; F * p	2	10	6.1	−32	56	24	IC 1783	L. Swift	GX	12.5	2.0′ × 0.8′	PGC 8279
S11–36	1897 Dec 25	2	11	10	−31	39.3		pF; pS; R; distant D * nf.	2	15	50.0	−31	12	4	IC 1788	L. Swift	GX	12.3	2.6′ × 1.1′	PGC 8649
S11–37	1896 Oct 12	2	11	20	−12	24.9		eeF; eeE; A ray bet 2 st p and f; 8 m * near nf	2	16	10.4	−11	55	36	IC 1787 = IC 217	S. Javelle (1893)	GX	13.6	2.2′ × 0.5′	PGC 8673
S11–38	1897 Dec 22	2	25	45	−34	42.0		eeeF; S; R; D * nearly p; np of 2.	2	30	38.2	−34	15	51	IC 1811	L. Swift	GX	13.4	1.3′ × 0.9′	PGC 9555
S11–39	1897 Dec 22	2	26	0	−34	41.7		eF; eS; R; F * near n; D * np; sf of 2.	2	30	49.5	−34	13	16	IC 1813	L. Swift	GX	13.2	1.2′ × 0.8′	PGC 9567

(continued)

Catalog 11 (Lowe observatory)

				Equinox 1900.0							Equinox 2000.0									
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S11–40	1897 Dec 22	2	26	15	−36	28.9		pB; pS; vE.	2	31	5.8	−36	2	5	IC 1814 = NGC 964	J. Herschel (1834)	GX	12.6	2.0′ × 0.5′	PGC 9582*
S11–41	1896 Oct 12	2	27	50	−37	11.7		vF; S; R; wide D * near p	2	31	51.0	−36	40	19	IC 1816	L. Swift	GX	12.8	1.4′ × 1.2′	PGC 9634
S11–42	1897 Sep 6	2	34	3	−27	52.4		pB; C S; R; 8 m * near p.	2	39	3.5	−27	26	35	IC 1826 = IC 1830	L. Swift	GX	12.8	1.7′ × 1.4′	PGC 10041
S11–43	1897 Dec 22	2	37	0	−28	37.0		eeF; S; R; 3 fine D stars nf, each about 7″.	2	41	38.7	−28	10	17	IC 1833	L. Swift	GX	13.1	1.5′ × 0.8′	PGC 10205
S11–44	1897 Dec 22	2	40	35	−28	22.6		eeF; S; R; D * np.	2	45	37.3	−27	57	40	IC 1845	L. Swift	GX	13.5	1.1′ × 0.7′	PGC 10441*
S11–45	1897 Sep 5	2	44	30	−31	42.5		vF; pS; R; 1st of 3.	2	49	8.4	−31	17	23	IC 1858	L. Swift	GX	13.1	1.8′ × 0.6′	PGC 10671
S11–46	1897 Sep 5	2	44	32	−31	36.5		pF; pS; R; 2nd of 3.	2	49	3.9	−31	10	21	IC 1859	L. Swift	GX	13.2	1.2′ × 0.8′	PGC 10665
S11–47	1897 Sep 5	2	45	4	−31	36.5		pF; pS; lE; 3rd of 3.	2	49	33.9	−31	11	22	IC 1860	L. Swift	GX	12.7	1.7′ × 1.2′	PGC 10707
S11–48	1897 Nov 25	2	47	10	−33	46.8		eeeF; vS; lE; 7 m * in field sf; eee diff.	2	51	58.7	−33	20	23	IC 1862	L. Swift	GX	13.3	3.0′ × 0.3′	PGC 10858
S11–49	1897 Oct 19	2	49	5	−34	36.9		eF; S; R	2	53	39.3	−34	11	52	IC 1864	L. Swift	GX	12.6	1.2′ × 0.7′	PGC 10925

S11–50	1897 Sep 29	2	59	28	−39	52.6		eF; pS; R; F D * sf point to it.	3	3	56.6	−39	26	25	IC 1875	L. Swift	GX	12.5	1.4′ × 1.2′	PGC 11549
S11–51	1896 Sep 16	3	0	20	−27	52.6		eeF; vS; R; F * near sf	3	4	32.3	−27	27	38	IC 1876	L. Swift	GX	14.1	1.1′ × 1.0′	PGC 11577
S11–52	1896 Oct 8	3	5	8	−25	42.5		eeF; pS; 2 st in meridian close p	3	9	36.2	−25	15	13	IC 1895	L. Swift	GX	13.3	1.5′ × 1.1′	PGC 11807
S11–53	1897 Dec 22	3	7	30	−25	42.0		eeF; S; R; 2 F st near sp. point to it.	3	12	13.1	−25	18	18	IC 1899	L. Swift	GX	13.4	1.2′ × 0.4′	PGC 11930
S11–54	1897 Nov 25	3	21	25	−33	14.9		eeF; pS; lE; 7 or 8 pB st n live letter V	3	26	2.3	−32	53	41	IC 1919	L. Swift	GX	13.0	1.3′ × 1.0′	PGC 12825
S11–55	1897 Oct 3	3	26	20	−44	27.0		pB; pS; R	3	38	44.9	−44	6	2	IC 1943 = NGC 1411	J. Herschel (1835)	GX	11.3	2.3′ × 1.7′	PGC 13429*
S11–56	1897 Sep 7	3	31	0	−34	46.9		pB; S; eeeE; a hair line 90°. See note.	3	35	31.0	−34	26	50	IC 1963 = IC 335	L. Swift	GX	11.9	2.6′ × 0.7′	PGC 13277*
S11–57	1897 Nov 17	3	32	30	−44	19.2		eeeF; vS; eeE; a ray, 90°; B * f	3	36	31.5	−43	57	25	IC 1970	L. Swift	GX	12.1	3.2′ × 0.7′	PGC 13322
S11–58	1897 Dec 26	3	35	40	−27	11.2		eF; eS; lE; * close nf	3	40	29.5	−26	51	43	IC 1981 = NGC 1412	J. Herschel (1835)	GX	12.5	1.8′ × 0.7′	PGC 13520
S11–59	1896 Oct 8	3	36	45	−22	55.6		vF; pS; R; not [NGC] 1426	3	40	56.9	−22	33	52	IC 1983 = NGC 1415	W. Herschel (1784)	GX	11.9	3.5′ × 1.7′	PGC 13544*
S11–60	1896 Oct 5	3	37	1	−18	32.3		eeF; S; R; in vacancy	3	41	44.7	−18	16	1	IC 346	F. Muller (1887)	GX	13.1	1.9′ × 1.2′	PGC 13575*
S11–61	1897 Oct 14	3	39	10	−40	12.3		eF; pL; R; 2 st nr f; wide D * np	3	42	41	−39	53.6		IC 1988	L. Swift				Missing

(continued)

Catalog 11 (Lowe observatory)

				Equinox 1900.0							Equinox 2000.0									
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S11–62	1897 Nov 19	3	43	0	−34	2.0		eF; L; CE; 7 1/2 m in contact; ee diff.	3	47	4.8	−33	42	35	IC 1993	L. Swift	GX	11.7	2.5′ × 2.1′	PGC 13840
S11–63	1897 Oct 3	3	50	20	−36	17.1		p B; S; R; * near nf; D * sp	3	54	28.4	−35	58	2	IC 2006	L. Swift	GX	11.3	2.1′ × 1.8′	PGC 14077
S11–64	1897 Dec 26	3	50	40	−28	26.3		eF; S; R; F * in contact nf.	3	55	22.7	−28	9	30	IC 2007 - IC 2008	L. Swift	GX	13.0	1.3′ × 0.8′	PGC 14106*
S11–65	1896 Oct 5	3	51	1	−28	30.4		eF; vS; eeeF; * v close nf	3	55	22.7	−28	9	30	IC 2008 = IC 2007	L. Swift	GX	13.0	1.3′ × 0.8′	PGC 14106*
S11–66	1897 Nov 19	4	6	30	−39	58.0		eeeF; pS; R; 9 m * f; e diff.	4	9	55.1	−39	41	19	IC 2036	L. Swift	GX	13.5	1.0′ × 0.8′	PGC 14586
S11–67	1897 Dec 23	4	8	30	−32	49.8		vF; vS; R; resolv. Susp.; 1531–2 in field.	4	12	59.8	−32	33	12	IC 2040	L. Swift	GX	13.1	1.4′ × 0.8′	PGC 14670
S11–68	1897 Sep 29	4	8	45	−33	7.8		eF; vS; R; 10 m * close s.	4	12	34.9	−32	49	2	IC 2041 = IC 2048	L. Swift	GX	14.0	1.0′ × 0.5′	PGC 14656*
S11–69	1895 Dec 10	4	10	32	−33	22.4		eeeF; eS; B * f; 1532 p; 3 in field with D neb; ee diff.	4	12	34.9	−32	49	2	IC 2048 = IC 2041	L. Swift	GX	14.0	1.0′ × 0.5′	PGC 14656*
S11–70	1897 Sep 29	4	16	30	−31	41.7		eeF; pL; R.	4	20	26.3	−31	43	29	IC 2059	L. Swift	GX	12.9	1.3′ × 0.4′	PGC 14910*

S11–71	1895 Dec 9	4	23	3	−42	23.3		eF; pL; R; 3 st like belt of Orion point to it; p of 2	4	26	36.9	−42	5	37	IC 2068	L. Swift	GX	13.4	1.2′ × 0.8′	PGC 15106
S11–72	1896 Oct 5	4	41	2	−34	10.7		vF; pS; R; 3 st near sp nearly point to it	4	44	44	−33	59.7		IC 2090	L. Swift				Missing
S11–73	1897 Dec 26	4	52	0	−28	41.6		eeeF; pL; components of D * 24 s f point to it	4	56	33.9	−28	30	14	IC 2106	E. E. Barnard (1889)	GX	13.0	1.7′ × 0.9′	PGC 16373
S11–74	1897 Nov 30	5	2	30	−20	37.3		eeeF; pS; bet 2 st; close to eeeF D *; eee diff.	5	6	51.0	−20	20	43	IC 2119	L. Swift	GX	13.6	1.1′ × 0.7′	PGC 16759
S11–75	1897 Dec 26	5	15	10	−25	11.5		eeeF; S; R; 7 m * 15 s p nearly obliterates it; eee diff.	5	19	44.9	−25	3	51	IC 2121	L. Swift	GX	12.3	1.9′ × 1.1′	PGC 17110
S11–76	1897 Nov 19	5	15	35	−37	13.0		pB; eS; R; 3 st in line nf	5	19	1.4	−37	5	22	IC 2122	L. Swift	GX	12.8	1.5′ × 1.3′	PGC 17081
S11–77	1897 Nov 26	5	20	25	−27	4.6		eeeF; vS; R; eee diff.	5	24	28.1	−27	0	57	IC 2125	L. Swift	GX	13.3	1.0′ × 0.7′	PGC 17238
S11–78	1897 Dec 1	5	27	5	−23	8.3		eeF; pS; R; 7 m * near sf	5	31	50.4	−23	8	40	IC 2129 = IC 2130	L. Swift	GX	13.1	1.8′ × 0.9′	PGC 17402*
S11–79	1896 Oct 13	5	27	30	−23	14.7		eF; pL; R; 8 m * near nf	5	31	50.4	−23	8	40	IC 2130 = IC 2129	L. Swift	GX	13.1	1.8′ × 0.9′	PGC 17402*
S11–80	1896 Oct 16	5	27	40	−17	20.1		pB; vS; R; bet 2 st p and f	5	32	18.5	−17	13	26	IC 2131 = IC 422	S. Javelle (1893)	GX	13.2	0.7′ × 0.7′	PGC 17409
S11–81	1898 Feb 22	5	29	20	−36	28.5		eeeF; eeS; eeeE; ee dif; See note.	5	33	12.9	−36	23	56	IC 2135 = IC 2136	L. Swift	GX	12.5	2.8′ × 0.6′	PGC 17433*
S11–82	1895 Dec 9	5	29	35	−26	30.7		eF; pS; eE; almost a ray; [NGC] 1963 p	5	33	12.9	−36	23	56	IC 2136 = IC 2135	L. Swift	GX	12.5	2.8′ × 0.6′	PGC 17433*

(continued)

Catalog 11 (Lowe observatory)

				Equinox 1900.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S11–83	1897 Dec 1	5	30	0	−23	36.5		eeF; S; R; 7 m * close p; sf of 1980.	5	34	21.7	−23	32	0	IC 2137 = IC 2138	G. Bigourdan (1887)	GX	13.1	1.2′ × 0.8′	PGC 17463*
S11–84	1898 Feb 14	5	30	8	−23	24.3		e F; v S; R; 8 m * f 10s; in field with [NGC] 1979	5	34	21.7	−23	32	0	IC 2138 = IC 2137	G. Bigourdan (1887)	GX	13.1	1.2′ × 0.8′	PGC 17463*
S11–85	1897 Oct 7	5	42	30	−18	43.2		e e F; p S; e E, 45° triangle sf	5	46	52.6	−18	43	35	IC 2143	L. Swift	GX	12.5	2.1′ × 0.9′	PGC 17810
S11–86	1897 Nov 3	5	44	0	−30	31.9		eeeF; pS; R; F * np; several B st sf; 3 st curved.	5	43	28.0	−30	29	42	IC 2147	L. Swift	GX	12.7	1.8′ × 1.4′	PGC 17662*
S11–87	1898 Jan 31	5	47	40	−38	22.8		eeeF; S; eE; semi circle of 3 st s; v diff.	5	51	18.6	−38	19	14	IC 2150	L. Swift	GX	12.8	2.7′ × 0.8′	PGC 18000
S11–88	1897 Oct 7	5	48	30	−17	53.2		vF; pL; R; v wide D st near p	5	53	0.1	−17	52	34	IC 438	L. Swift	GX	12.0	2.8′ × 2.1′	PGC 18047*
S11–89	1897 Dec 1	5	53	0	−23	11.5		pB; pS; R; in vacancy; several B st f.	5	57	53.4	−23	10	51	IC 2152	L. Swift	GX	12.6	1.5′ × 1.2′	PGC 18148
S11–90	1897 Dec 1	5	56	45	−23	41.5		pB; L; R; bet * nf and a wide D * np.	6	1	8.0	−23	40	20	IC 2154 = NGC 2139	W. Herschel (1784)	GX	11.6	2.4′ × 1.9′	PGC 18258

S11–91	1897 Dec 1	6	1	5	−27	51.8		vF; pS; lE; * in contact nf; n end like a brush. Note	6	5	18.0	−27	51	25	IC 2158	L. Swift	GX	12.0	1.7′ × 1.3′	PGC 18388*
S11–92	1895 Mar 23	8	5	35	+5	22.8		eeeF; vS; lE; v close f 12 m *; fine D * nf nearly point to it	8	11	1.6	+5	5	14	IC 2231	L. Swift	GX	14.0	1.0′ × 1.0′	PGC 22950
S11–93	1897 Dec 28	9	18	10	−32	2.9		pF; C S; vE; 10 m * close sp.	9	23	1.1	−32	26	59	IC 2469	L. Swift	GX	11.2	4.7′ × 1.0′	PGC 26561
S11–94	1898 Jan 22	9	23	0	−42	24.5		pB; S; R; 7 m * nf; D * p.	9	26	50	−42	50.6		IC 2484	L. Swift				Missing
S11–95	1898 Feb 20	9	31	5	−11	56.5		pB; pL; R; 2 st near f.	9	36	5.8	−12	26	12	IC 2494 = NGC 2947 = IC 547	F. Leavenworth (1886)	GX	12.4	1.6′ × 1.3′	PGC 27309
S11–96	1898 Feb 19	9	39	40	−31	18.6		eF; S; R; vF * close nf; pB * near sp.	9	44	34.2	−31	47	25	IC 2507	L. Swift	GX	12.7	1.8′ × 0.9′	PGC 27903
S11–97	1897 Dec 30	9	45	0	−32	23.1		pB; pS; eeE; spindle; 7 m * np; not 3038; np of 2.	9	49	24.6	−32	50	20	IC 2511 = IC 2512	L. Swift	GX	12.3	2.9′ × 0.6′	PGC 28246*
S11–98	1898 Feb 12	9	45	5	−32	27.7		eeeF; pS; vE; between below * and 8 m * p; nf of 2.	9	49	24.6	−32	50	20	IC 2512 = IC 2511	L. Swift	GX	12.3	2.9′ × 0.6′	PGC 28246*
S11–99	1898 Feb 12	9	45	30	−32	27.8		eeeF; eeeS; R; D * close sf; sp. of 2.	9	50	0.8	−32	52	58	IC 2513 = IC 2514	L. Swift	GX	12.5	3.0′ × 0.6′	PGC 28283*
S11–100	1897 Dec 30	9	45	35	−32	25.1		eeF; eS; 3 F st close f; sf of 2.	9	50	0.8	−32	52	58	IC 2514 = IC 2513	L. Swift	GX	12.5	3.0′ × 0.6′	PGC 28283*

(continued)

Catalog 11 (Lowe observatory)

				Equinox 1900.0							Equinox 2000.0									
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S11–101	1897 Dec 30	9	52	32	−31	48.0		vF; S; R; 7 1/2 m * nf; 2 or 3 F st near.	9	57	3.0	−32	15	25	IC 2526	L. Swift	GX	12.6	2.0′ × 0.7′	PGC 28732
S11–102	1897 Dec 28	9	54	5	−26	42.6		eeeF; eeS; R; eF; D * s; [NGC] 3078 in field; ee diff.	9	59	6.4	−27	7	44	IC 2528 = NGC 3084	J. Herschel (1835)	GX	12.3	1.7′ × 1.2′	PGC 28841
S11–103	1898 Apr 11	9	54	50	−22	21.9		eeF; eS; eF * in contact	9	59	29.5	−22	49	34	IC 2529 = NGC 3081	W. Herschel (1786)	GX	12.0	2.1′ × 1.6′	PGC 28876
S11–104	1898 Feb 15	9	55	25	−29	10.5		eeeF; pS; CE; trapezium n and nf; D * np.	9	59	55.5	−29	37	4	IC 2531	L. Swift	GX	12.0	6.9′ × 0.6′	PGC 28909
S11–105	1898 Feb 14	9	59	25	−27	4.8		eeF; L; CE; no B * near; no triangle as per 3113	10	3	51.9	−27	34	15	IC 2537	L. Swift	GX	12.1	2.6′ × 1.7′	PGC 29179
S11–106	1897 Dec 28	10	11	20	−33	3.3		eeF; pS; iR; in center of trapezium.	10	16	18.7	−33	33	50	IC 2560	L. Swift	GX	11.7	3.2′ × 2.0′	PGC 29993
S11–107	1897 Dec 30	10	16	38	−33	46.3		vF; CS; R; 9 m * p close f.	10	21	35.1	−34	16	0	IC 2571 = NGC 3223	J. Herschel (1835)	GX	11.0	4.1′ × 2.8′	PGC 30308

S11–108	1897 Dec 30	10	24	30	−35	3.3		eeeF; eeS; R; eF * in contact; sp of [NGC] 3267	10	29	6.4	−35	35	43	NGC 3260	J. Herschel (1834)	GX	12.6	1.2′ × 1.0′	PGC 30875*
S11–109	1898 Jan 1	10	26	3	−28	12.5		pF; vS; R; trapezium near sp.	10	31	2.4	−28	43	0	IC 2586	L. Swift	GX	12.5	0.9′ × 0.5′	PGC 31025
S11–110	1898 Jan 1	10	27	10	−29	52.6		eeeF; pL; R; D * nr sf; * with distant companion f and p.	10	31	50.1	−30	23	4	IC 2588	L. Swift	GX	12.7	1.4′ × 1.2′	PGC 31088
S11–111	1898 Feb 15	10	27	30	−23	32.3		eeeF; eS; eE; 8 m * close p; eee dif.	10	32	20.8	−24	2	15	IC 2589	L. Swift	GX	13.4	0.9′ × 0.6′	PGC 31126
S11–112	1898 Feb 15	10	31	30	−23	34.2		eF; pS; R; bet 2 D st sp and nf.	10	36	4.2	−24	19	23	IC 2594	L. Swift	GX	12.4	1.4′ × 1.4′	PGC 31405
S11–113	1898 Feb 22	10	32	35	−10	35.9		CB; eS; R; almost stellar	10	37	33	−11	7.0		IC 2595	L. Swift				Missing
S11–114	1898 Feb 14	10	33	25	−26	32.3		pB; pS; D * near p	10	37	47.3	−27	4	52	IC 2597	E. E. Barnard (1890)	GX	11.8	2.6′ × 1.8′	PGC 31586
S11–115	1897 Dec 30	10	35	12	−35	31.6		eeeF; eeS; R; eF * in contact; sf of 2. Note.	10	39	49.8	−36	2	10	NGC 3333	J. Herschel (1835)	GX	13.2	2.0′ × 0.4′	PGC 31723*
S11–116	1897 Dec 29	10	36	0	−35	5.4		eeeF; eS; R; eeF D * near s	10	40	34	−35	36.7			L. Swift				Missing*
S11–117	1898 Jan 14	10	58	30	−15	41.7		eeF; eeS; looks like a D *. Note	11	2	59.7	−16	17	22	IC 2622 = NGC 3508	W. Herschel (1785)	GX	13.2	1.0′ × 0.9′	PGC 33362
S11–118	1898 Apr 11	11	2	20	−19	1.1		CB; pS; R; n of 2	11	7	18.1	−19	28	18	IC 2624 = NGC 3497	W. Herschel (1790)	GX	12.6	2.6′ × 1.5′	PGC 33667

(continued)

Catalog 11 (Lowe observatory)

				Equinox 1900.0							Equinox 2000.0									
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S11–119	1898 Apr 11	11	2	25	−19	1.8		eeeF; vS; R; s of 2	11	7	19.1	−19	33	21	IC 2625 = NGC 3529	J. Herschel (1835)	GX	14.2	1.4′ × 1.1′	PGC 33671
S11–120	1898 Apr 10	11	5	0	−23	12.0		eF; L; R; sev st in L semi circle n, in finder field with beta Crateris	11	9	53.4	−23	43	34	IC 2627	L. Swift	GX	12.0	2.4′ × 2.3′	PGC 33860
S11–121	1898 Jan 1	11	17	0	−28	27.5		pB; pS; R; 10 m * close nf; 7 m * f.	11	27	5.0	−28	58	49	IC 2764	L. Swift	GX	12.2	1.6′ × 1.4′	PGC 35222
S11–122	1898 Feb 12	11	26	50	−29	52.7		vB; pS; R; sf of [NGC] 3717.	11	31	51.3	−30	24	39	IC 2913	L. Swift	GX	13.0	0.8′ × 0.8′	PGC 35554
S11–123	1898 Feb 22	11	44	0	−11	45.3		eF; CL; iR; triangle n, another f.	11	49	6	−12	18.7		IC 2962	L. Swift				Missing
S11–124	1898 Feb 20	11	45	25	−19	2.0		B; S; eE; a ray	11	54	1.5	−19	34	7	IC 2965 = NGC 3957	W. Herschel (1785)	GX	11.8	3.1′ × 0.7′	PGC 37326*
S11–125	1897 May 4	11	47	23	−3	10.2		eF; pS; R; B * f 55 s; np of 2.	11	52	31.3	−3	52	20	IC 2969	L. Swift	GX	12.9	1.3′ × 0.8′	PGC 37196*
S11–126	1898 May 12	11	48	5	−22	34.0		pB; pS; R; not [NGC] 3955	11	53	10	−23	7.4		IC 2970	L. Swift				Missing

S11–127	1895 Mar 23	11	48	33	−3	25.2		vF; pS; R; 2 B st n and np; s of 2	11	53	40.6	−3	59	47	IC 2972 = NGC 3952	W. Herschel (1787)	GX	13.1	1.6′ × 0.7′	PGC 37285
S11–128	1895 Mar 23	11	48	48	−4	34.3		eeeF; vS; lE; ray; in vacancy; 4 F st in line s; 1 B &3 F st n.	11	53	48.7	−5	10	4	IC 2974	L. Swift	GX	13.2	2.2′ × 0.5′	PGC 37304
S11–129	1897 May 23	11	49	23	−2	10.0		vF; vS; R; vF * near nf.	11	56	1.1	−2	43	15	IC 2976 = NGC 3979	E. Holden (1881)	GX	12.9	1.1′ × 0.9′	PGC 37488*
S11–130	1897 Dec 29	11	49	35	−37	21.1		eF; vS; 7 m * sp.	11	55	14.6	−37	41	46	IC 2977	L. Swift	GX	12.3	1.6′ × 0.7′	PGC 37405
S11–131	1897 Dec 30	12	0	30	−27	22.7		vF; L; CE; 8 m * near f; np of 2.	12	5	46.9	−27	56	24	IC 2995	L. Swift	GX	12.2	3.2′ × 1.0′	PGC 38330*
S11–132	1898 Apr 11	12	0	30	−25	57.2		CB; S; R; triple star sp	12	5	35.3	−26	31	22	NGC 4087	W. Herschel (1789)	GX	12.1	2.1′ × 1.7′	PGC 38303
S11–133	1898 Jan 1	12	0	35	−27	24.4		eeeF; pL; iR; 3 8 m st f; sf of 2.	12	5	46.9	−27	56	24	IC 2995	L. Swift	GX	12.2	3.2′ × 1.0′	PGC 38330*
S11–134	1898 Apr 11	12	2	55	−29	47.4		eeeF; CS; R; D * sf; v diff.	12	7	57.4	−30	20	22	IC 3010	L. Swift	GX	12.2	1.9′ × 1.8′	PGC 38511
S11–135	1898 Jan 31	12	3	25	−31	2.2		pB; vF * close sf; vE 45°.	12	9	0.3	−31	31	11	IC 3015	L. Swift	GX	12.3	2.9′ × 0.7′	PGC 38588
S11–136	1898 Jan 1	12	14	28	−25	37.3		pB; S; R; bet 4 st sf and 8 m * np.	12	19	36.0	−26	8	44	IC 3152	L. Swift	GX	12.5	1.8′ × 1.2′	PGC 39688
S11–137	1898 Jan 30	12	18	45	−39	14.0		pF; vS; R; close p [NGC] 4373; Note.	12	25	9.0	−39	46	32	IC 3290	L. Swift	GX	12.0	2.0′ × 1.4′	PGC 40470
S11–138	1898 Jan 1	12	20	0	−25	30.3		eF; vS; R; bet 7 m * f and 8 m * np; v diff.	12	24	57.4	−26	1	51	IC 3289	L. Swift	GX	13.0	1.0′ × 1.0′	PGC 40446

(continued)

Catalog 11 (Lowe observatory)

				Equinox 1900.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S11–139	1898 Jan 30	12	22	5	−38	48.8		pB; pL; R; 7 m * with distant companion near p.	12	27	37.3	−39	20	16	IC 3370	L. Swift	GX	11.0	2.9′ × 2.3′	PGC 40887
S11–140	1898 Feb 15	12	35	15	−36	13.3		pF; pS; 2 or 3 vF st in contact.	12	40	52.9	−36	45	21	IC 3639	L. Swift	GX	12.3	1.1′ × 0.9′	PGC 42504
S11–141	1897 May 23	12	43	2	+54	59.8		eeF; S; CE; [NGC] 4732 in field	12	47	32.1	+54	22	30	IC 3791 = NGC 4695	W. Herschel (1791)	GX	13.4	1.1′ × 0.7′	PGC 43173*
S11–142	1898 Feb 23	12	44	20	−3	51.4		eeF; L; eE; 7 m * nr sf	12	49	29	−4	24.1		IC 3807	L. Swift				Missing
S11–143	1898 Jan 1	12	45	0	−25	22.3		eeeF; S; E; 8 m * nf.	12	50	2.3	−25	55	14	IC 3813	L. Swift	GX	12.6	1.2′ × 0.9′	PGC 43418
S11–144	1898 Jan 31	12	46	0	−27	17.6		B; S; lE	12	51	32.5	−27	46	59	IC 3829	L. Swift	GX	12.9	1.9′ × 0.8′	PGC 43558*
S11–145	1898 Apr 21	12	53	0	−22	21.9		eeeF; eeeS; 3 vF st n; 7 m * s, another np.	12	58	10.4	−22	52	33	IC 3927	L. Swift	GX	12.6	1.2′ × 1.0′	PGC 44419
S11–146	1898 Mar 28	12	54	54	−34	48.9		eeF; pS; lE	13	5	20.2	−35	20	15	IC 3974 = NGC 4947	J. Herschel (1834)	GX	11.8	2.4′ × 1.3′	PGC 45269*
S11–147	1898 Jan 31	12	55	0	−31	43.8		eeF; pS; R; 10 m * nr nf.	13	1	0.8	−32	26	29	IC 3986	L. Swift	GX	11.8	1.9′ × 1.5′	PGC 44852*

S11–148	1898 Feb 27	13	1	25	−23	22.1		eeF; eS; R; 1st of 3	13	6	56.5	−23	55	1	IC 4180	L. Swift	GX	12.7	0.9′ × 0.7′	PGC 45408
S11–149	1898 Feb 27	13	2	0	−23	29.1		eeF; eS; R; 11 m * near p; 2nd of 3	13	7	33.8	−24	0	31	IC 4196 = NGC 4970	W. Herschel (1789)	GX	12.2	1.8′ × 1.0′	PGC 45466
S11–150	1898 Feb 27	13	2	30	−23	17.1		eeF; eS; R; 8 m * 37 s f; 3rd of 3	13	8	4.3	−23	47	49	IC 4197	L. Swift	GX	12.4	1.6′ × 1.0′	PGC 45514
S11–151	1897 May 23	13	4	27	+53	23.8		vF; pL; R	13	8	41.7	+52	46	27	IC 4205 = IC 853	E. Swift	GX	13.9	1.1′ × 1.0′	PGC 45560*
S11–152	1897 Dec 31	13	11	10	−31	33.8		pB; pS; R; 9 m * near sf; np of 2.	13	17	42.7	−32	6	6	IC 4214	L. Swift	GX	11.4	2.8′ × 1.8′	PGC 46304
S11–153	1897 Dec 31	13	12	5	−31	7.8		eeeF; pL; R; 9 m * near sp.; sf of 2	13	18	29.7	−31	37	51	IC 4219	L. Swift	GX	13.0	1.2′ × 1.1′	PGC 46363
S11–154	1898 Mar 28	13	14	0	−27	54.1		eeeF; eS; R; [NGC] 5078 near nf	13	19	40.6	−27	25	44	IC 4222 = IC 879	F. Muller (1888)	GX	13.1	1.2′ × 0.8′	PGC 46479*
S11–155	1897 Dec 31	13	18	25	−29	47.6		eeF; pS; R; trapezium nr sf.	13	24	50.3	−30	18	28	IC 4233 = NGC 5124	J. Herschel (1834)	GX	12.1	2.2′ × 0.7′	PGC 46902*
S11–156	1897 May 22	13	18	23	+6	45.3		eeeF; pS; eE; in vacancy; v diff.	13	23	27.5	+6	23	34	IC 4236 = NGC 5118	W. Herschel (1793)	GX	13.7	0.9′ × 0.8′	PGC 46782*
S11–157	1898 May 23	13	27	0	−23	42.0		eF; pS; vF * near n and brighter one nf	13	32	53.4	−24	12	26	IC 4280	L. Swift	GX	12.6	1.1′ × 0.9′	PGC 47688
S11–158	1897 Dec 30	13	31	0	−33	35.0		pF; pS; R	13	36	39.1	−33	57	57	IC 4296	L. Swift	GX	10.6	3.4′ × 3.2′	PGC 48040
S11–159	1897 Dec 30	13	31	10	−33	33.9		eeeF; eeS; like D * one nebulous; Note.	13	36	47.6	−34	3	57	IC 4299	L. Swift	GX	12.6	1.8′ × 0.6′	PGC 48057

(continued)

Catalog 11 (Lowe observatory)

				Equinox 1900.0							Equinox 2000.0									
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S11–160	1897 Jun 25	13	47	20	+14	46.9		eeeF; pL; R; eee diff; 3rd of 4; others in Index Cat.	13	52	19.3	+14	16	19	IC 4337	L. Swift	GX	14.7	0.5′ × 0.2′	PGC 49253
S11–161	1897 Apr 20	13	47	38	−0	38.0		vL; eF; CE n and s; Munich 9619 nf 121 s; in field with [NGC] 5334; F * close to each end of major axis	13	52	54.5	−1	6	53	IC 4338 = NGC 5334	W. Herschel (1787)	GX	11.3	4.5′ × 3.5′	PGC 49308*
S11–162	1897 Dec 30	13	51	30	−39	31.5		8 m * in center of eeeF nebulosity; Note	13	57	44.0	−39	58	48	IC 4347 = NGC 5367	J. Herschel (1834)	RN		4′ × 3′	Bernes 147*
S11–163	1898 Apr 21	13	51	40	−24	44.1		eeeF; eeeS; like a D * n one a nebula. Note	13	57	13.9	−25	14	45	IC 4350	L. Swift	GX	12.6	1.9′ × 0.7′	PGC 49628*
S11–164	1898 May 19	13	52	20	−34	2.8		several eF st in eeF neb; 2 8 m st n	13	58	25.1	−34	31	2	IC 4352	L. Swift	GX	12.4	1.9′ × 0.7′	PGC 49726
S11–165	1898 Jan 30	13	59	40	−38	43.7		eeF; pS; R; bet 2 st nr center of trap.	14	5	36.6	−39	12	12	IC 4367	L. Swift	GX	12.2	1.6′ × 1.4′	PGC 50266

S11–166	1898 Apr 21	14	1	50	−26	32.0		eeeF; pS; R; forms part of trapezium; not 5495	14	7	29.8	−27	1	4	IC 4374	L. Swift	GX	12.4	2.3′ × 1.7′	PGC 50385
S11–167	1898 Feb 22	14	6	50	−30	3.5		F; pS; R; 7 F st around it	14	12	24.2	−30	38	39	NGC 5494	J. Herschel (1835)	GX	11.9	2.2′ × 1.9′	PGC 50732
S11–168	1896 Sep 16	14	14	22	−3	59.8		vF; S; R; * with distant companion near n; p of 2	14	19	59.2	−4	27	4	IC 997	L. Swift	GX	12.8	1.3′ × 0.8′	PGC 51220*
S11–169	1896 Sep 16	14	14	40	−3	58.8		eeF; S; R; f of 2	14	20	19.3	−4	24	59	IC 998	L. Swift	GX	15.0	0.9′ × 0.3′	PGC 1058483*
S11–170	1898 May 19	14	22	0	−37	8.2		eeF; vS; R; F * near f	14	28	31.3	−37	35	2	IC 4421	L. Swift	GX	12.3	1.1′ × 0.7′	PGC 51704
S11–171	1897 Mar 28	14	25	0	−43	4.5		pF; pS; R	14	31	38.6	−43	25	6	IC 4441 = IC 4444	L. Swift	GX	11.4	1.7′ × 1.3′	PGC 51905
S11–172	1898 Feb 22	14	28	20	−27	7.3		pB; eS; R; like D * one nebulous. Note	14	34	28.6	−27	31	7	IC 4453	L. Swift	GX	12.2	2.3′ × 1.0′	PGC 52084*
S11–173	1896 Sep 16	14	35	10	+3	48.5		eF; S; lE	14	40	29.4	+3	25	58	IC 1039	S. Javelle (1891)	GX	14.7	0.6′ × 0.3′	PGC 52428*
S11–174	1896 Sep 16	14	35	10	+3	54.5		eeF; S; R; close D with [NGC] 5718	14	40	39.0	+3	28	11	IC 1042	S. Javelle (1891)	GX	13.3	1.1′ × 1.1′	PGC 52433*
S11–175	1897 Jun 2	14	46	16	+27	59.3		eeF; S; lE; pB * p; ee diff; another susp.	14	50	55.4	+27	34	43	IC 4514	S. Javelle (1895)	GX	14.2	0.8′ × 0.7′	PGC 53010
S11–176	1898 Jun 2	14	49	37	+16	47.5		vF; pS; R; only 1 * near, 10 m * nf	14	54	23.5	+16	21	19	IC 4516	L. Swift	GX	13.2	1.1′ × 0.8′	PGC 53274
S11–177	1897 Jun 21	15	14	59	+2	8.9		vF; pS; vE; B * partly obscures it	15	20	3	+1	47.2		IC 4540	L. Swift				Missing

(continued)

Catalog 11 (Lowe observatory)

				Equinox 1900.0							Equinox 2000.0								
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S11–178	1895 May 26	15	15	10	−23	19.8		eeeF; vL; not 5898 or 5903; v diff; bet 2 wide D st. Note	15	21	11.6	−23	39	30	IC 4538	L. Swift	GX	12.1	2.6′ × 2.0′	PGC 54776*
S11–179	1897 Jun 3	15	19	52	+13	50.2		eF; pS; vF * close np	15	24	59.5	+13	26	42	IC 4543 = IC 1118	S. Javelle (1891)	GX	14.3	1.0′ × 0.6′	PGC 55035
S11–180	1898 May 24	15	27	30	−50	18.9		pB; pS; lE	15	35	28.6	−50	39	35	IC 4550 = NGC 5946	J. Herschel (1834)	GC	9.5	7.1′	GCL 36
S11–181	1897 Jun 21	15	30	0	+5	2.0		eF; pS; R; near one of 6 or 8 st in a curve	15	38	54.9	+4	34	59	IC 4552	L. Swift	GX	13.4	1.2′ × 1.2′	PGC 55687*
S11–182	1896 Sep 16	15	53	0	+12	23.0		eeF; pS; R; in center of trapezium	15	58	8.0	+12	4	13	IC 1149	L. Swift	GX	13.3	1.1′ × 0.9′	PGC 56511*
S11–183	1897 Jul 22	16	18	45	+12	59.3		eeeF; lE; F * near f; 2 B st s nearly point to it; eee diff.	16	23	38.8	+11	47	11	IC 4602 = NGC 6132	E. Stephan (1876)	GX	13.6	1.5′ × 0.5′	PGC 58002*
S11–184	1897 Jul 6	19	22	0	−36	24.1		B; eS; lE	19	27	51.6	−36	13	0	IC 4863	L. Swift	AST			double star*
S11–185	1897 Jul 6	19	49	10	−37	37.2		eeeF; pS; 3 st s like belt of Orion point to it; eee diff.	19	56	47.6	−37	19	42	IC 4913	L. Swift	GX	13.0	1.4′ × 0.9′	PGC 63850

S11–186	1897 Jul 6	19	53	30	−38	50.5		eeeF; S; lE; precedes the below 37 s e diff; p of 2	20	0	12.1	−38	34	43	IC 4926	L. Swift	GX	12.8	1.2′ × 1.0′	PGC 63961
S11–187	1897 Jul 6	19	54	0	−38	50.5		eeF; pS; R; 8 m * f 20s f of 2	20	0	50.3	−38	34	30	IC 4931	L. Swift	GX	11.9	2.4′ × 1.9′	PGC 63976
S11–188	1897 Jul 8	19	59	0	−48	42.4		eeeF; pS; R; F * near n; ee diff; p of 2	20	6	28.2	−48	22	32	IC 4943	L. Swift	GX	12.7	1.5′ × 1.1′	PGC 64102
S11–189	1897 Jul 8	20	0	0	−48	35.8		B; vS; CE; f of 2	20	7	19.5	−48	22	13	IC 4949 = NGC 6861	J. Dunlop (1826)	GX	11.1	2.8′ × 1.8′	PGC 64136*
S11–190	1897 Jul 22	20	2	16	−45	55.8		vF; pS; R	20	11	31.2	−45	35	36	IC 4956	L. Swift	GX	12.4	1.7′ × 1.7′	PGC 64230
S11–191	1897 Sep 23	20	10	59	−41	53.4		vF; cS; R; no bright * near	20	17	46	−41	34.9		IC 4991	L. Swift				Missing*
S11–192	1897 Jul 22	20	19	10	−31	11.6		eF; pS; lE; wide D * near s.	20	31	39.1	−30	49	55	IC 5004 = NGC 6923	J. Herschel (1834)	GX	11.9	2.6′ × 1.3′	PGC 64884*
S11–193	1897 Jul 25	20	20	50	−36	20.9		pB; vS; eE	20	28	33.8	−36	1	38	IC 5011 = IC 5013	L. Swift	GX	11.7	2.4′ × 1.2′	PGC 64772*
S11–194	1897 Aug 29	20	22	0	−36	22.3		eeS; eE in meridian; curious object	20	28	33.8	−36	1	38	IC 5013 = IC 5011	L. Swift	GX	11.7	2.4′ × 1.2′	PGC 64772*
S11–195	1897 Sep 16	20	24	25	−36	39.2		vF; CS; R; several pB st sf	20	30	51	−36	19.1		IC 5019	L. Swift				Missing
S11–196	1897 Aug 29	20	24	30	−33	50.9		pF; pS; lE	20	30	38.5	−33	29	8	IC 5020	L. Swift	GX	12.3	3.0′ × 2.1′	PGC 64845
S11–197	1897 Aug 29	20	36	50	−30	11.5		vF; pS; R; 2 F st near nf point to it; 1st of 3	20	43	14.3	−29	51	12	IC 5039 = IC 5046 = IC 5003 = IC 5029	L. Swift	GX	12.7	2.4′ × 0.6′	PGC 65249*

(continued)

Catalog 11 (Lowe observatory)

				Equinox 1900.0							Equinox 2000.0									
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S11–198	1897 Aug 29	20	37	5	−30	11.5		eeF; eS; eE; near p * of sev curved; 2nd of 3	20	43	14.3	−29	51	12	IC 5039 = IC 5046 = IC 5003 = IC 5029	L. Swift	GX	12.7	2.4′ × 0.6′	PGC 65249*
S11–199	1897 Aug 29	20	37	30	−30	1.5		eeeF; pS; vE; eee diff; 3rd of 3	20	43	34.5	−29	42	13	IC 5041 = IC 5047 = IC 5007 = IC 5030	L. Swift	GX	12.6	2.6′ × 1.5′	PGC 65258*
S11–200	1897 Jun 9	20	38	39	−30	16.5		eF; pS; vE; eeF * and a vF * near sf, point to it; sp. of 2	20	43	14.3	−29	51	12	IC 5046 = IC 5003 = IC 5029 = IC 5039	L. Swift	GX	12.7	2.4′ × 0.6′	PGC 65249*
S11–201	1897 Jun 9	20	38	45	−30	6.5		eeF; pS; vE; 8 m * 31′ n; v diff; nf of 2	20	43	34.5	−29	42	13	IC 5047 = IC 5007 = IC 5030 = IC 5041	L. Swift	GX	12.6	2.6′ × 1.5′	PGC 65258*
S11–202	1897 Sep 17	20	40	25	−38	50.6		eeF; pS; R	20	47	23.8	−38	25	4	IC 5049	L. Swift	GX	13.5	1.2′ × 0.9′	PGC 65378
S11–203	1897 Aug 12	20	58	49	+11	25.3		eeeF; vS; p 8 m * 13 s same parallel; wide D * near n; ee diff.	21	3	51.5	+11	45	49	IC 5083	L. Swift	GX	14.2	0.5′ × 0.5′	PGC 66011
S11–204	1897 Sep 15	21	1	31	−30	26.5		eeF; pS; R; F * near f 90°	21	8	32.0	−29	46	8	IC 5086	E. E. Barnard (1890)	GX	12.8	1.5′ × 1.5′	PGC 66179*

S11–205	1896 Sep 12	21	25	40	+11	20.3		eeF; vS; F* near f; not [NGC] 7068	21	30	57.3	+11	45	49	IC 5115	L Swift	GX	14.9	0.4′ × 0.3′	PGC 66882
S11–206	1897 Jul 9	21	26	5	−37	9.0		eF; pS; R; e wide D * f 30s	21	34	7.7	−36	39	22	IC 5114 = NGC 7091	J. Herschel (1834)	GX	12.9	2.1′ × 1.7′	PGC 66972
S11–207	1897 Sep 17	21	41	0	−35	22.0		vF; vS; R	21	47	25.3	−34	53	1	IC 5131	L. Swift	GX	12.3	1.4′ × 1.4′	PGC 67352
S11–208	1897 Sep 17	21	42	0	−35	27.0		vF; pL; R; sp. of 2; not [NGC] 7130 or [NGC] 7135	21	48	19.5	−34	57	5	IC 5135 = NGC 7130	J. Herschel (1834)	GX	12.1	1.5′ × 1.4′	PGC 67387
S11–209	1897 Sep 17	21	43	30	−35	22.2		eeF; pL; R; 3 B st for a triangle; nf of 2	21	49	46.0	−34	52	35	NGC 7135	J. Herschel (1834)	GX	11.7	2.9′ × 1.9′	PGC 67425
S11–210	1897 Sep 17	21	49	46	−49	31.9		eeF; pS; R; in line with 2 9 m st sf; 7 m * sf	21	56	9.7	−49	31	19	IC 5143 = NGC 7155	J. Herschel (1834)	GX	12.2	2.3′ × 2.0′	PGC 67663*
S11–211	1897 Aug 31	22	3	5	−28	21.2		eeF; vS; vE; triangle with 2 F st	22	8	45.6	−27	51	24	IC 5168	L. Swift	GX	14.8	1.3′ × 0.4′	PGC 68133
S11–212	1896 Aug 8	22	15	19	−14	54.1		vF; eE; a ray; p of 2	22	30	59.9	−14	0	13	IC 5204 = NGC 7300	J. Herschel (1830)	GX	12.8	2.0′ × 1.0′	PGC 69040*
S11–213	1896 Aug 8	22	16	30	−19	25.3		eeeF; vS; R; f below * 15 s little s. f of 2	22	22	31.1	−18	52	11	IC 5210	L. Swift	GX	13.0	1.2′ × 1.1′	PGC 68674
S11–214	1896 Jun 8	22	16	45	−19	23.3		eF; S; near n of f * of 7 in line p and f; p of 2	22	22	43.1	−18	52	49	IC 5211	L. Swift	GX	13.6	1.1′ × 0.7′	PGC 68695

(continued)

Catalog 11 (Lowe observatory)

				Equinox 1900.0							Equinox 2000.0									
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S11–215	1896 Aug 8	22	26	54	−14	38.1		pB; pS; R; B * near s; f of 2	22	32	23.8	−14	7	14	IC 5228 = NGC 7302	W. Herschel (1785)	GX	12.3	1.7′ × 1.1′	PGC 69094
S11–216	1897 Jul 7	22	35	0	−38	33.8		vF; pS; R	22	31	7.2	−38	1	35	IC 5239	L. Swift	GX	14.2	0.9′ × 0.6′	PGC 69044*
S11–217	1897 Aug 8	22	36	0	−45	19.2		pF; pL; R; f * near sf	22	41	52.4	−44	46	2	IC 5240	W. H. Finlay (1886)	GX	11.9	2.8′ × 1.9′	PGC 69521
S11–218	1896 Sep 11	22	49	10	−20	55.3		eeeF; pL; R; f 9 m * 22 s; ee diff.	22	54	25.3	−20	21	47	IC 5261	L. Swift	GX	13.2	1.5′ × 1.3′	PGC 69969
S11–219	1896 Jun 10	22	51	5	−37	8.8		vF; S; eeE; a ray; sp of below st; sp. of 2	22	56	53.0	−36	33	15	IC 5264	E. E. Barnard (1889)	GX	12.6	2.5′ × 0.5′	PGC 70081
S11–220	1896 Jun 16	22	51	10	−37	3.8		B; C L; R; bet 2 st p and f; nf of 2	22	57	10.6	−36	27	44	IC 5265 = IC 1459	E. E. Barnard (1889)	GX	10.0	5.2′ × 3.8′	PGC 70090
S11–221	1897 Sep 23	22	51	30	−43	59.4		pB; S; R; mbM	22	57	13.6	−43	23	46	IC 5267	W. H. Finlay (1886)	GX	10.5	5.2′ × 3.9′	PGC 70094
S11–222	1896 Sep 10	22	52	0	−36	27.7		vF; pS; R; np of 2	22	57	43.7	−36	1	34	IC 5269	L. Swift	GX	12.2	1.8′ × 0.8′	PGC 70110
S11–223	1896 Aug 12	22	52	5	−36	37.7		vF; pS; vE; sf of 2	22	57	54.9	−35	51	29	IC 5270	L. Swift	GX	12.3	3.2′ × 0.6′	PGC 70117

S11–224	1896 Aug 12	22	53	40	−38	17.8		vF; CL; lE; 2 wide D st near p	22	59	26.7	−37	42	10	IC 5273	E. E. Barnard (1889)	GX	11.4	2.7′ × 1.8′	PGC 70184
S11–225	1896 Sep 10	23	5	30	−33	5.2		a few eeeF st in neb	23	11	17.3	−32	27	7	IC 5289	L. Swift	GX	13.4	1.2′ × 0.8′	PGC 70645
S11–226	1897 Oct 22	23	10	29	−43	8.4		pB; pS; R; 8 m * p	23	16	10.8	−42	35	5	IC 5294 = NGC 7552	J. Dunlop (1826)	GX	10.6	3.4′ × 2.7′	PGC 70884
S11–227	1897 Aug 8	23	13	50	−42	49.8		eeF; S; CE; f of [NGC] 7599	23	19	21.1	−42	15	25	IC 5308 = NGC 7599	J. Dunlop (1826)	GX	11.5	4.4′ × 1.3′	PGC 71066
S11–228	1897 Aug 8	23	16	18	−43	3.3		eeeF; pL; R; 10 m * near sp	23	22	0.9	−42	28	50	IC 5313 = NGC 7632	J. Herschel (1834)	GX	12.1	2.2′ × 1.1′	PGC 71213
S11–229	1896 Sep 13	23	21	0	−19	36.0		eF; vS; R; F * close nf	23	26	20.0	−17	57	23	IC 5321	L. Swift	GX	13.0	1.3′ × 0.8′	PGC 71430*
S11–230	1897 Aug 8	23	23	8	−42	2.0		pB; pS; R; 9 m * close s	23	28	43.4	−41	20	1	IC 5325	L. Swift	GX	11.3	2.8′ × 2.5′	PGC 71548*
S11–231	1896 Sep 14	23	24	10	−29	25.9		eee F; S; vE; 8 m * p	23	29	35.2	−28	49	52	IC 5326	L. Swift	GX	13.9	1.1′ × 0.4′	PGC 71581
S11–232	1897 Oct 3	23	27	45	−45	35.7		vF; S; R; bet 2 st; 8 m * sf, 7 m * sp	23	33	16.5	−45	0	57	IC 5328	L. Swift	GX	11.4	2.5′ × 1.5′	PGC 71730
S11–233	1897 Nov 19	23	29	0	−36	39.0		eeeF; vL; bet 2 st; D * p 45 s; pentagon p	23	34	27.5	−36	6	4	IC 5332	L. Swift	GX	10.5	7.8′ × 6.2′	PGC 71775
S11–234	1897 Oct 19	23	33	58	−23	4.5		eF; pS; 7 1/2 m * 19 s sf = AWe. 18,042	23	39	22.5	−22	29	56	IC 5343	L. Swift	GX	13.6	0.8′ × 0.6′	PGC 72032
S11–235	1897 Sep 23	23	39	25	−43	29.2		eF; eS; R	23	44	59.2	−42	54	39	IC 5348 = NGC 7744	J. Herschel (1834)	GX	11.9	2.2′ × 1.7′	PGC 72300

(continued)

Catalog 11 (Lowe observatory)

				Equinox 1900.0							Equinox 2000.0									
Swift object no.	Date of disc	RA			DEC			Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′	″		h	m	s	°	′	″						
S11–236	1896 Sep 14	23	41	40	−28	32.9		eeeF; eS; R; 9 m * near f; 1st of 5	23	47	14.6	−27	57	28	IC 5350	L. Swift	GX	13.5	0.7′ × 0.6′	PGC 72396
S11–237	1896 Sep 14	23	42	0	−28	42.3		eF; S; R; 6 m * f; 2nd of 5	23	47	28.6	−28	6	34	IC 5353	L. Swift	GX	13.0	1.4′ × 1.0′	PGC 72421
S11–238	1896 Sep 14	23	42	5	−28	42.9		eeF; S; R; 3rd of 5	23	47	28.3	−28	8	10	IC 5354	L. Swift	GX	14.0	0.8′ × 0.4′	PGC 72416
S11–239	1896 Sep 14	23	42	20	−28	43.9		eF; pS; E; 4th of 5	23	47	45.0	−28	8	27	IC 5358	L. Swift	GX	12.6	2.5′ × 1.0′	PGC 72441
S11–240	1897 Sep 25	23	42	40	−37	36.9		eeF; CS; R; in vacancy	23	47	54	−37	3.6		IC 5360	L. Swift				Missing
S11–241	1896 Sep 14	23	45	0	−28	54.9		eeF; pS; bet 2 B *; 5th of 5	23	51	36.7	−28	21	54	IC 5362 = IC 5363	L. Swift	GX	12.8	1.3′ × 1.3′	PGC 72648*
S11–242	1896 Sep 15	23	51	0	−29	37.9		vF; pS;R; 8 m * near sf	23	56	24.6	−29	1	22	IC 5364	L. Swift	GX	13.3	0.7′ × 0.7′	PGC 72950/72955
S11–243	1897 Sep 25	23	52	25	−37	34.9		pB; CS; eE; 1 * near sf	23	57	35	−37	1.5		IC 5365	L. Swift				Missing*

Catalog 12 (Lowe observatory)																			
				Equinox 1900.0						Equinox 2000.0									
Swift object no.	Date of disc	RA			DEC		Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′		h	m	s	°	′	″						
S12–1	1898 May 24	0	4	10	−32	49.9	vF, vS, R, unequal D * n.	0	9	35.5	−32	16	37	IC 1531	L. Swift	GX	12.4	1.8′ × 1.4′	PGC 684
S12–2	1898 May 24	0	5	30	−7	58.3	eeeF, vS, R, bet 7 1/2 m * n and 9 m * s, eee diff.	0	10	37	−7	24.9		IC 1533	L. Swift				Missing
S12–3	1898 May 22	0	29	40	−30	32.9	eeeF, S, R, wide D * close p point to it. Not 174.	0	34	32.7	−30	1	5	IC 1555	L. Swift	GX	13.7	1.2′ × 0.9′	PGC 2071
S12–4	1898 Nov 19	0	53	0	−17	?	pF, vS, 7 1/2 m * np, F * near s p.	0	57	58	−16	?	?	IC 1604	L. Swift				Missing
S12–5	1897 May 24	1	0	0	−27	56.4	eF, pS, close to 3 st like belt of Orion.	1	4	56.2	−27	25	45	IC 1616	L. Swift	GX	12.6	1.7′ × 1.4′	PGC 3846
S12–6	1897 Oct 12	1	4	0	−29	6.6	cB, pS, R, 3 8 m st near.	1	8	47.5	−28	34	57	IC 1628	L. Swift	GX	12.5	1.1′ × 1.1′	PGC 4075
S12–7	1897 Sep 20	1	28	0	−14	0.8	eeF, R, S, lE, 8 m * n, e dif.	1	32	55	−13	29.3		IC 1714	L. Swift				Missing
S12–8	1897 Oct 10	1	54	15	−28	16.5	eeF, S, R, 8 m * S, 1 f.	1	59	11.8	−27	48	39	IC 1763	L. Swift	GX	13.8	1.0′ × 0.8′	PGC 7514

(continued)

Catalog 12 (Lowe observatory)

				Equinox 1900.0						Equinox 2000.0									
Swift object no.	Date of disc	RA			DEC		Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′		h	m	s	°	′	″						
S12–9	Previous	11	49	?	−5	?	eeF, lE, v small, 3 B st in line n, also circle of st n. Saw it twice, failed once.	11	52	41.3	−6	27	11	IC 2975	L. Swift	AST			double star
S12–10	1897 Jun 24	12	15	5	+61	15.0	eeeF, S, 7 1/2 m and 5 m st in field, p of 2. One of my faintest nebulae.	12	20	12.6	+58	5	35	IC 3166 = NGC 4284	W. Herschel (1789)	GX	13.5	2.5′ × 1.2′	PGC 39775*
S12–11	1897 Jun 24	12	15	35	+61	15.0	vF, pL, R, 7 1/2 m * south, f of 2.	12	20	47.5	+58	5	33	IC 3180 = NGC 4290	W. Herschel (1789)	GX	11.8	2.3′ × 1.6′	PGC 39859*
S12–12	1897 Aug 19	15	29	?	+6	21.0	eeeF, L, R, eee diff.	15	37	36.2	+5	58	26	IC 4551 = NGC 5964	J. Herschel (1830)	GX	12.0	4.2′ × 3.2′	PGC 55637
S12–13	1897 Aug 19	15	50	?	+6	19.0	eF, S, R, bet 8 m * f, and curve of st p.	15	55	57.4	+5	55	55	IC 4586 = NGC 6014	J. Herschel (1830)	GX	12.2	1.7′ × 1.6′	PGC 56413
S12–14	1897 Aug 16	19	41	20	−33	34.0	eeeF, eeS, eee dif sev st near.	19	47	47	−33	19.3		IC 4898	L. Swift				Missing
S12–15	1897 Sep 11	19	59	0	−44	19.3	eF, S, R, 3 or 4 st f, form with the neb, a circle, sp of 2.	20	23	58.1	−43	59	43	IC 4946	L. Swift	GX	11.8	2.5′ × 1.0′	PGC 64614*

S12–16	1897 Sep 17	19	59	30	−43	59.3	vF, pS, R, bet a wide D * f and a * np, nf of 2.	20	24	28.1	−43	39	13	IC 4948 = NGC 6902	J. Herschel (1836)	GX	10.9	5.6′ × 3.9′	NGC 64632*
S12–17	1897 Sep 11	20	17	25	−38	33.9	eF, pS, R, bet 2 8 1/2 m st nf and sp.	20	23	59	−38	14.7		IC 4998	L. Swift				Missing*
S12–18	1897 Sep 8	20	19	0	−30	11.8	vF, C, S, R, 2 st nr sf, point to it. Sp of 2.	20	43	14.3	−29	51	12	IC 5003 = IC 5029 = IC 5039 = IC 5046	L. Swift	GX	12.7	2.4′ × 0.6′	PGC 65249*
S12–19	1897 Sep 8	20	19	25	−30	1.8	eeF, C, L, R, bet 2 groups of B st sf, and np, nf of 2.	20	43	34.5	−29	42	13	IC 5007 = IC 5030 = IC 5041 = IC 5047	L. Swift	GX	12.6	2.6′ × 1.5′	PGC 65258*
S12–20	1897 Aug 18	20	22	20	−32	1.9	pB, pS, R, nearly bet 2 st with dist. companion.	20	28	34	−31	42.1		IC 5015	L. Swift				Missing
S12–21	1897 Sep 11	20	24	0	−38	32.9	eF, pS, R, bet 2 8 1/2 m st nf and sp.	20	30	32	−38	12.9		IC 5018	L. Swift				Missing*
S12–22	1897 Jul 26	20	34	10	−30	11.6	eeF, eS, eE, F * with dist. Com. nr sf, point to it, np of 2.	20	43	14.3	−29	51	12	IC 5029 = IC 5039 = IC 5046 = IC 5003	L. Swift	GX	12.7	2.4′ × 0.6′	PGC 65249*
S12–23	1897 Jul 26	20	34	30	−30	12.6	eeeF, vS, cE, ee dif, sf of 2.	20	43	34.5	−29	42	13	IC 5030 = IC 5041 = IC 5047 = IC 5007	L. Swift	GX	12.6	2.6′ × 1.5′	PGC 65258*
S12–24	1897 Sep 8	20	44	10	−30	11.8	vF, pS, R, 8 m * in margin of field n.	20	51	45.8	−29	50	50	IC 5065	L. Swift	GX	13.5	1.0′ × 0.8′	PGC 65580

(continued)

Catalog 12 (Lowe observatory)

				Equinox 1900.0						Equinox 2000.0									
Swift object no.	Date of disc	RA			DEC		Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′		h	m	s	°	′	″						
S12–25	1897 Aug 19	21	18	0	−41	3.3	vF, vS, R, * with dist. com. n and s.	21	24	22.0	−40	32	16	IC 5105	L. Swift	GX	11.6	2.7′ × 1.8′	PGC 66694
S12–26	1897 Jul 24	21	36	30	−39	27.0	eeeF, vS, R, 5 or 6 st nr sp., v dif.	21	43	11.8	−38	58	6	IC 5128	L. Swift	GX	13.0	1.2′ × 0.7′	PGC 67232
S12–27	1897 Sep 15	21	42	55	−34	7.0	eeF, S, R, wide D * points to it, sev p B st sf and np.	21	49	46.0	−34	52	35	IC 5136 = NGC 7135	J. Herschel (1834)	GX	11.7	3.0′ × 2.1′	PGC 67425*
S12–28	1897 Aug 18	21	44	50	−31	26.8	vF, S, lE.	21	50	25.7	−30	59	41	IC 5139	L. Swift	GX	12.3	2.0′ × 1.0′	PGC 67447
S12–29	1897 Jul 23	21	53	0	−39	52.8	vF, L, lE, 2 B st point to it, nearest in contact.	21	59	35.2	−39	23	8	IC 5148 = IC 5150	W. Gale (1894)	PN	11.0	2.2′ × 2.2′	PN G002.7–52.4
S12–30	1897 Sep 8	21	53	0	−27	51.5	eF, S, R, 6 1/2 m * same parallel follows 63 s.	21	58	59.1	−27	24	50	IC 5149	L. Swift	GX	13.6	1.3′ × 0.5′	PGC 67770
S12–31	1897 Jul 26	21	57	0	−35	27.1	pB, pS, R, 3 st in line nr nf.	22	3	27.0	−34	56	30	IC 5157	L. Swift	GX	12.0	1.6′ × 1.5′	PGC 67941
S12–32	1897 Oct 16	21	57	26	−34	17.0	pF, pS, R, in vacancy.	22	3	14.9	−33	50	18	IC 5156	L. Swift	GX	12.2	2.4′ × 0.8′	PGC 67932
S12–33	1897 Jul 26	22	7	25	−37	22.5	vF, L, R, * close S, B * sp.	22	16	9.1	−36	50	38	IC 5179 = IC 5183 = IC 5184	L. Swift	GX	11.8	2.2′ × 1.2′	PGC 68455*

S12–34	1897 Sep 20	22	9	30	−36	20.3	pB, C, S, F * in contact sf, sev p B st form segment of large circle.	22	16	9.1	−36	50	38	IC 5183 = IC 5184 = IC 5179	L. Swift	GX	11.8	2.2′ × 1.2′	PGC 68455*
S12–35	1897 Jul 19	22	9	35	−37	22.4	pF, pS, lE, bet 2 st in meridian, 8 1/2 m * sp., np of 2.	22	16	9.1	−36	50	38	IC 5184 = IC 5179 = IC 5183	L. Swift	GX	11.8	2.2′ × 1.2′	PGC 68455*
S12–36	1897 Jul 19	22	10	25	−37	20.4	eeF, S, R, F * nr p, 8 m * np, sf of 2.	22	18	46.5	−36	48	6	IC 5186	L. Swift	GX	11.9	1.5′ × 1.0′	PGC 68548
S12–37	1897 Jul 26	22	18	5	−27	58.5	eF, pS, R, 8 m * p.	22	22	43.4	−27	21	21	IC 5214	L. Swift	GX	14.4	1.2′ × 0.2′	PGC 68694*
S12–38	1897 Oct 6	22	26	0	−25	52.6	eeF, pS, R, bet 2 st, a dozen st in margin of field f, form semicircle 4 st np a curve, one D, sp. of 2.	22	32	8.1	−25	23	52	IC 5225 = NGC 7294	F. Leavenworth (1886)	GX	12.5	1.9′ × 1.2′	PGC 69088*
S12–39	1897 Oct 6	22	26	10	−25	10.3	eeeF, pL, R, no * nr, trapezium, nf of 2.	22	32	30.2	−25	39	43	IC 5226	L. Swift	GX	12.6	1.8′ × 1.4′	PGC 69097*
S12–40	1897 Jul 19	22	34	20	−30	31.6	eeeF, eeeS, eeeE, eee dif, a line. 8 m * np.	22	42	18.4	−30	3	19	IC 5237 = NGC 7361	J. Herschel (1834)	GX	12.3	3.8′ × 1.0′	PGC 69539*
S12–41	1897 Jul 19	22	49	0	−37	53.5	eeF, pS, R, 9 m * nr sp, ee dif.	22	54	18.6	−39	18	54	IC 5260 = NGC 7404	J. Herschel (1836)	GX	12.8	1.5′ × 0.9′	PGC 69964*
S12–42	1897 Aug 22	22	49	40	−34	22.0	eeeF, pS, R, bet a * p and a wide D nf, 8 m * f, eee dif, np of 2.	22	55	20.5	−33	53	17	IC 5262	L. Swift	GX	13.3	1.0′ × 0.6′	PGC 70007

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Catalog 12 (Lowe observatory)

				Equinox 1900.0						Equinox 2000.0									
Swift object no.	Date of disc	RA			DEC		Description	RA			DEC			NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′		h	m	s	°	′	″						
S12–43	1897 Aug 22	22	52	30	−34	17.0	pF, pS, vE, bet 2 st.	22	58	1.8	−33	44	32	IC 5271	L. Swift	GX	11.6	2.6′ × 0.9′	PGC 70128
S12–44	1897 Jul 26	23	13	0	−10	50.6	eF, S, R, 3 or 4 F st nr sp.	23	18	52.5	−10	15	34	IC 5304	L. Swift	GX	13.4	1.4′ × 0.9′	PGC 71028
S12–45	1897 Jul 24	23	47	0	−29	11.4	vF, eS, R, 3 st in line p, one D.	23	51	36.7	−28	21	54	IC 5363 = IC 5362	L. Swift	GX	12.8	1.3′ × 1.3′	PGC 72648*

Catalog 13																			
Discoveries not in swift catalogs																			
				Equinox1885.0						Equinox 2000.0									
Swift object no.	Date of disc	RA			DEC		Description		RA			DEC		NGC/IC	Original discoverer	Type	V Mag	Size	Remarks
		h	m	s	°	′		h	m	s	°	′	″						
S13–1	1887	14	49	45	+52	34.4	pB, pS, iR, F * inv	14	53	28.3	+52	4	34	NGC 5783 = NGC 5785	L. Swift	GX	12.8	2.9′ × 1.8′	PGC 53217
S13–2	1886	16	56	30	+59	8.9	eeF, S, R, v diffic, np of 2	16	58	24.0	+58	57	21	NGC 6285	L. Swift	GX	13.5	1.3′ × 0.7′	PGC 59344
S13–3	1887 May 13	17	13	27	+57	29.3	eeF, S, R, 3rd of 3	17	15	24.4	+57	19	22	NGC 6346	L. Swift	GX	14.3	0.7′ × 0.5′	PGC 59946
S13–4	1886	18	11	57	+36	5.4	eeF; eS; R; v diff.	18	16	10.8	+36	4	43	NGC 6612	L. Swift	GX	14.5	0.7′ × 0.7′	PGC 61665
S13–5	1886	23	41	12	−17	10.8	vF, S, R, lbM, B * n	23	48	54.7	−16	32	28	NGC 7759	F. Leavenworth (1885)	GX	13.7	1.3′ × 1.0′	PGC 72496
S13–6	1886	23	47	40	+7	28.7	vF, vS, R, lbM, F * inv	23	53	32.2	+8	7	5	NGC 7780	E. Stephan (1881)	GX	13.9	1.0′ × 0.5′	PGC 72775

Notes

S1–2 – Moved extensive description from S1–3 to this entry.[1]

S1–3 – Moved extensive description from this entry to S1–2.[2]

S1–5 – This object has frequently been identified as PGC 11761 in catalogs, but Gottlieb's observation indicates that object is too faint to have been seen by Swift. Corwin, Gottlieb, and Seligman all believe that Swift's object is identical to PGC 11815, which happens to be IC 1883 that was later found by Barnard in 1888. Swift's position is 42 s west of IC 1883.

S1–13 – PGC 36548 matches Swift's description and is located 12 s west and 1.5 arc minutes north of Swift's position.

S1–14 – PGC 36582 matches Swift's description and is located 10 s east and 2 arc minutes north of Swift's position.

S1–15 – PGC 36620 matches Swift's description and is located 7 s east and 1.5 arc minutes north of Swift's position.

S1–17 – PGC 36967 is located 7 arc minutes north of Swift's position.

S1–19 – Swift wrote the following: "It was found 1885 Apr. 6, while searching for Tempel's Comet. On the 8th it was missing, the evening of the 7th having been cloudy prevented a search for it. A most determined effort to re–find it was made on the evening of the 8th and also on the 10th and 13th but in vain. Neither could it be found at Harvard College Observatory. It was very faint, and in several sweeps was overlooked, but when once found could be seen without difficulty. It was of course a Comet, but I thought at the time that the Decl. was too great to be Tempel's. No. 19 must therefore be struck out …."[3]

S1–22 – Swift's description matches that of NGC 4542, which is located about 50 s to the east of his position.

S1–29 – Same as S1–30.

S1–30 – Same as S1–29.

S1–34 – The closest match is a 15.5 magnitude star. Corwin suggests that this might be NGC 5563, with Swift's offset being about 2.8 arc minutes south in declination. If this is NGC 5563, then Albert Marth would be the discoverer.

S1–39 – Corwin suggests that this object is actually NGC 5870, which Swift found two nights later. Swift's position is 7 min east of NGC 5870. Same as S1–41.

S1–41 – Same as S1–39.

S1–43 – Same as S8–86.

S1–46 – Corwin suggests this is CGCG 109–028 (PGC 58423). Swift's position would have an offset of $1^m\ 30^s$ in right ascension. The main problem is that the faint star at the preceding end would actually be at the following end.

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[1] L. Swift, "Catalogue No. 3 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **115** (1886 Sep. 14), pp. 157–158.

[2] L. Swift, "Catalogue No. 3 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **115** (1886 Sep. 14), pp. 157–158.

[3] L. Swift, "Catalogue No. 2 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **113** (1886 Jan. 26), pp. 305–306.

S1–54 – Corwin suggested this is UGC 10711 (PGC 59573). Swift's offsets would be 30 s east in right ascension and 28 arc minutes south in declination.

S1–60 – The description in the table has been corrected by adding "Edward."[4]

S1–62 – Gottlieb said Swift's position is 6 arc minutes north of UGC 10881 (PGC 60356).

S1–65 – Same as S9–81.

S1–71 – The description in the table has been corrected by adding "Edward."[5]

S1–80 – Same as S1–81.

S1–81 – Same as S1–80.

S1–82 – Nothing is located at Swift's position; however, PGC 60938 matches Swift's description and is located 40 s west and 1.3 arc minutes north.

S1–83 – Same as S4–61.

S1–95 – Same as S2–66.

S1–96 – Same as S2–65.

S1–98 – Swift wrote: "Like many of the stars, some of the nebulae are double and triple. One of my own, New General Catalogue, No. 6679, is a close double, suspected with a power of 132, confirmed with 200, and well separated with 250."[6] Same as S3–100.

S1–99 – Nothing exists at Swift's position. Although his description is fairly basic, the only galaxy bright enough for Swift to have seen in an area of 2° by 2° centered on Swift's position is NGC 6667, which Swift found in September of 1883. Corwin said, "its inner regions perhaps fit Swift's description …." NGC 6667 is located 2.5 min west and 8.6 arc minutes north of Swift's position. Same as S2–69 and S4–70.

S2–20 – For more than a century, this object was linked to the galaxy PGC 9377, which was 16 s east and 1.3 arc minutes south of Swift's position. In 2014, Gottlieb wrote to Corwin with a new link. Gottlieb's copy of Swift's second paper came from the library of astronomer Max Wolf of Heidelberg, Germany. For some reason, Wolf had changed the right ascension minutes from "20" to "21" and Gottlieb noted that this placed Swift's object very close to PGC 9432, which is IC 1799. Swift's position now only needed to be corrected by 10 s in right ascension and 7 arc seconds in declination. PGC 9432 was also brighter than PGC 9377.

S2–29 – At the beginning of Swift's second catalog from Warner Observatory, he said this object "with great probability" should "be struck out," as it may have been a comet. At the end of this same paper, he included the following note: "RESEMBLES A COMET. Moonlight and clouds prevented verification until Sept. 6, when it could not be found. Am certain of its place, and of its configuration with 4 stars. Have examined the place three times and am certain of its absence. Seeing on one occa-

[4] L. Swift, "Catalogue No. 6 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **117** (1887 Aug. 13), p. 221.

[5] L. Swift, "Catalogue No. 6 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **117** (1887 Aug. 13), p. 221.

[6] L. Swift, "Suggestions to Amateurs: Nebulae and Clusters," *Popular Astronomy* (1894 Apr.), p. 370.

sion as good as when discovered."[7] Corwin says, "Swift's position is within 12 seconds of time and 20 arc seconds of IC 359, and his description fits. I think this is the object he saw, in spite of his comments."[8] The Author has chosen to accept Corwin's identification. This means that S2–29 is identical to S10–14, which Swift discovered in 1891.

S2–30 – Same as S7–9.

S2–31 – This is a portion of the Rosette Nebula. Swift wrote: "This remarkable object was discovered many years ago while sweeping for Comets, but until 1881 I supposed it was a well known nebula. Like the Merope nebula it requires a low power and a large field to see it well, and, like it, is also much obscured by a cluster of bright stars. It slightly precedes and is a little north of the cluster, and at first would naturally be mistaken for a glow from it."

"Through ordinary telescopes it appears to have no visible boundaries, but through my 16-inch refractor it once under excellent seeing conditions presented outlines sharp and distinct of an exact ellipse, with a pretty large easily seen nebula at each foci. I know of but two nebulae visible from this latitude that surpass it in size, viz. the Orion and Andromeda nebulae."

"Prof. Barnard has often seen it, at first like myself thought it might be a comet. At my request he re-observed it on Oct. 31, and the above place is as determined by him. He estimates it to be one degree in length by a half degree in breadth."

S2–39 – The description in the table has been corrected by adding "Edward."[9]

S2–41 – Same as S4–36.

S2–49 – Same as S2–50.

S2–50 – Same as S2–49.

S2–51 – There are two galaxies very close together near the position of Swift's object, NGC 6306 and NGC 6307. Swift wrote that S2–51 is "Close to 4278," which refers to object 4278 in J. F. W. Herschel's *General Catalogue*; however, this object is 14 arc minutes to the north and is not necessarily "close." Gottlieb suggests that Swift made an error and should have said that S2–51 was close to GC 4277, which is NGC 6307. Swift's position for S2–51 is only 1 min from this object, meaning that it is NGC 6306. Dreyer made an error by assigning S2–51 to NGC 6307.

S2–65 – Same as S1–96.

S2–66 – Same as S1–95.

S2–69 – Same as S1–99 and S4–70.

S2–75 – Same as S2–76.

S2–76 – Same as S2–75.

S2–80 – Same as S10–47.

S2–83 – Same as S4–79.

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[7] L. Swift, "Catalogue No. 2 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **113** (1886 Jan. 26), pp. 306, 309.

[8] H. G. Corwin, Jr., correspondence with G. W. Kronk (2017 May 12).

[9] L. Swift, "Catalogue No. 6 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **117** (1887 Aug. 13), p. 221.

S2–88 – Swift wrote: "This is a prototype of G. C. 4634 and several others, and, of No. 7 of my Catalogue No. 1, A. N. 2683, which differ from most neb. St. by being exactly in the center of circular nebulous atmospheres of uniform brightness."[10]

S2–89 – Errata was applied to the description.[11]

S2–95 – Although some catalogs identify this as UGC 12302, Corwin notes that similar offsets for three objects that Swift discovered on this night would link this object to PGC 1306660.

S2–100 – Errata was applied to the description.[12]

S3–8 – Swift's position is 18 s east and one arc minute south of PGC 7465. Same as S5–18.

S3–13 – Although Swift specifically indicated that this was not GC 5251 (NGC 993), virtually every source and researcher have determined that this is the object Swift saw. The description is an excellent match.

S3–16 – Although Swift found this in 1885, F. W. Herschel actually suspected this object in 1786. He said it might have been two stars, but he never confirmed it or included it in his catalog. Same as S5–34.

S3–17 – Errata was applied to the description.[13]

S3–32, **S3–33**, & **S3–34** – As noted earlier in the book, Barnard discovered three nebulae in November 1885 and included details in one of his many letters to Swift. Swift located the objects and stated in a letter to Barnard, "I don't see how you ever saw them,"[14] referring to their proximity to the star Rigel. Swift apparently forgot that Barnard had alerted him to these three objects, because he included all three in his 3rd catalog of nebulae published in the *Astronomische Nachrichten*, with discovery dates of December 2, 1885. After seeing Swift's newest catalog, Barnard wrote to the same journal, suggesting that Swift made a mistake and that he had actually discovered these nebulae. Swift admitted the mistake in the errata published in his 5th catalog and the errata has been applied to the description.[15]

S3–36 – This is part of the Rosette Nebula.

S3–51 – Nothing exists at Swift's position; however, the galaxy PGC 28206 matches his simple description and is located 1.5 min west and 6.5 arc minutes south of Swift's position.

S3–61 – Same as S11–129.

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[10] L. Swift, "Catalogue No. 2 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **113** (1886 Jan. 26), p. 310.

[11] L. Swift, "Catalogue No. 3 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **115** (1886 Sep. 14), pp. 157–158.

[12] L. Swift, "Catalogue No. 3 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **115** (1886 Sep. 14), pp. 157–158.

[13] L. Swift, "Catalogue No. 5 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **115** (1886 Dec. 18), pp. 37–38.

[14] L. Swift correspondence with E. E. Barnard (1886 Nov. 13).

[15] L. Swift, "Catalogue No. 5 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **116** (1886 Dec. 18), pp. 37–38.

S3–62 – Nothing exists at Swift's position; however, there is a galaxy located about 1.4° south which matches his description. This southern object was found by Tempel in 1875 and is designated NGC 4243.

S3–67 – The identity of this object has been debated over the years. Although Swift said there were six objects in the field of view, he actually does not say that he saw all six at the same time. There are numerous examples in Swift's lists where he indicated more objects were present in a certain field than there really were. This happened because he would re-observe some objects, determine slightly different positions, and assume they were different objects. He rarely double-checked a field. The description of this object matches that of NGC 5072 and this is what Swift saw.

S3–86 – Swift saw one object on June 6, 1886 and then logged two other objects in the same area on June 8, 1886. Gottlieb said only two galaxies are present in this field, not three. He suggested that Swift saw the brighter object on the 6th and both objects on the 8th, which would make S3–86 and S3–89 one and the same.

S3–87 – see S3–86.

S3–88 – Same as S7–69.

S3–89 – Same as S3–86.

S3–91 – Nothing is at Swift's position. Corder suggested a double star in a fairly empty field located 25 s west and one arc minute north of Swift's position. Corwin said this was an "attractive candidate." The Author accepts this double star as NGC 6059.

S3–100 – see S1–98.

S4–6 – Nothing is located at Swift's position; however, PGC 6982 is located 40 arc seconds north and matches his description.

S4–11 – Swift's position is 1 min of right ascension from NGC 1174. Spitaler first suggested that NGC 1174 was identical to NGC 1186, which was discovered by F. W. Herschel.[16] Others have since agreed.

S4–21 – Swift wrote: "Three of the ten or more nebulae in this interesting group are M. Stephan's presumably G. C. 5799 [NGC 6040], and certainly 5800 [NGC 6041] and 5801 [6042]. Two or 3 more are suspected. They are very difficult objects to see and especially to measure, atmospheric conditions seldom allowing them to be seen at all except Stephan's last two, which are quite interesting objects, but those he describes as faint and small and very small, I call pretty large."[17] Corwin, Gottlieb, and Steinicke agree that this object is probably identical to NGC 6042, as the description fits. Corwin and Gottlieb also point out that Swift's statement that this object is the south preceding of three should be changed to the south following of three.

S4–26 – Same as S7–71.

S4–29 – Same as S4–30.

S4–30 – Same as S4–29.

S4–35 – Same as S5–70.

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[16] R. Spitaler, "Ueber den Nebel NGC 1186," *Astronomische Nachrichten*, **127** (1891 Apr. 23), pp. 91–92.

[17] L. Swift, "Catalogue No. 4 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **115** (1886 Oct. 23), pp. 261–262.

S4–36 – Swift's position is 50 arc minutes south of NGC 6189. The description fits, except for the fact that the "2 stars near preceding" should say that the stars are following. Same as S2–41.

S4–38 – Nothing is located at Swift's position; however, PGC 58847 is located 6 min east in right ascension and two arc minutes north in declination. It also matches Swift's description.

S4–59 – Same as S5–81.

S4–61 – Same as S1–83.

S4–70 – Nothing exists at this position; however, Corwin points out that NGC 6667 (S2–69) is located exactly 50 arc minutes north of Swift's position, "suggesting a transcription error or a typo somewhere in Swift's reduction/publication chain." Same as S1–99 and S2–69.

S4–74 – Howe looked for this object on three nights, but found nothing; however, he wrote, "Upon each of them there was noticed a group of four stars of mag. 14, and near 'sev B st,' as noted by the discoverer."[18] He said this asterism was about 1 min following Swift's position. Others have also concluded that Swift saw this asterism.

S4–79 – Same as S2–83.

S4–80 – Same as S5–92.

S4–83 – Swift wrote, "The discovery of 83 Cat. IV was erroneous, but it is certainly GC. 6040."[19] GC 6040 is identical NGC 7260.

S4–92 – Same as S5–95.

S4–93 – Corwin says this object is identical to PGC 70914, which is exactly 2° south. The description matches.

S4–96 – Same as S5–100.

S5–1 – Muller said this object was identical to GC 5092, which is NGC 50.[20] Swift agreed in the errata of his 6th catalog.[21]

S5–13 – Muller said this object was identical to an object reported by E. Stephan.[22]

S5–18 – Same as S3–8.

S5–21 – Muller said this object was identical to an object reported by Ormond Stone.[23]

S5–22 – Same as S5–23.

S5–23 – Same as S5–22.

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[18] H. Howe, "Observations of Nebulae made at the Chamberlin Observatory, University Park, Colorado," *Monthly Notices of the Royal Astronomical Society*, **61** (1900 Nov.), p. 42.

[19] L. Swift, "Catalogue No. 6 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **117** (1887 Aug. 13), p. 221.

[20] F. Muller, "Dr. Swift′s Fifth Catalogue of New Nebulae," *Sidereal Messenger*, **6** (1887 Feb.), p. 84.

[21] L. Swift, "Catalogue No. 6 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **117** (1887 Aug. 13), p. 221.

[22] F. Muller, "Dr. Swift's Fifth Catalogue of New Nebulae," *Sidereal Messenger*, **6** (1887 Feb.), p. 84.

[23] F. Muller, "Dr. Swift's Fifth Catalogue of New Nebulae," *Sidereal Messenger*, **6** (1887 Feb.), p. 84.

S5–24 – Same as S5–27.

S5–27 – Nothing is at Swift's position. Corwin suggests this is NGC 863, with Swift's position being 5 min of right ascension east of the galaxy. Same as S5–24.

S5–28 – Muller said this object was identical to GC 5236 [NGC 926], which was found by Tempel.[24] Swift agreed in the errata of his 6th catalog.[25]

S5–30 – Muller said this object was identical to GC 5262 [NGC 1010], which was found by E. Stephan.[26] Swift agreed in the errata of his 6th catalog.[27]

S5–31 – Muller said this object was identical to GC 5263 [NGC 1011], which was found by E. Stephan.[28] Swift agreed in the errata of his 6th catalog.[29]

S5–33 – Muller said this object was identical to an object found by Stone;[30] however, it is not certain if the honor of first discovery goes to Swift or Stone. Swift found the object on September 29, 1886. Stone did not provide a date, but sent his paper containing this observation to the *Astronomical Journal* on October 12, 1886.[31]

S5–34 – Same as S3–16.

S5–48 – Nothing is at the position measured by Swift. Corwin notes that several objects discovered by Swift in October 1886 had errors of 5 min in right ascension. When this error is applied to this object, the position matches PGC 11188/11189.

S5–49 – Muller said this object was identical to an object found by Stone.[32] Swift discovered this object after Stone had sent his paper to the *Astronomical Journal*.

S5–50 – Muller said this object was identical to an object found by Stone.[33] Swift discovered this object after Stone had sent his paper to the *Astronomical Journal*.

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[24] F. Muller, "Dr. Swift's Fifth Catalogue of New Nebulae," *Sidereal Messenger*, **6** (1887 Feb.), p. 84.

[25] L. Swift, "Catalogue No. 6 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **117** (1887 Aug. 13), p. 221.

[26] F. Muller, "Dr. Swift's Fifth Catalogue of New Nebulae," *Sidereal Messenger*, **6** (1887 Feb.), p. 84.

[27] L. Swift, "Catalogue No. 6 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **117** (1887 Aug. 13), p. 221.

[28] F. Muller, "Dr. Swift's Fifth Catalogue of New Nebulae," *Sidereal Messenger*, **6** (1887 Feb.), p. 84.

[29] L. Swift, "Catalogue No. 6 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **117** (1887 Aug. 13), p. 222.

[30] F. Muller, "Dr. Swift's Fifth Catalogue of New Nebulae," *Sidereal Messenger*, **6** (1887 Feb.), p. 84.

[31] O. Stone, "List of Nebulas Observed at the Leander McCormick Observatory, and Supposed to be New," *Astronomical Journal*, **7** (1886 Nov. 24), p. 10.

[32] F. Muller, "Dr. Swift's Fifth Catalogue of New Nebulae," *Sidereal Messenger*, **6** (1887 Feb.), p. 84.

[33] F. Muller, "Dr. Swift's Fifth Catalogue of New Nebulae," *Sidereal Messenger*, **6** (1887 Feb.), p. 84.

S5–54 – Muller said this object was identical to an object found by Burnham.[34] Burnham mentioned the object in a paper published in 1879.[35] Swift agreed in the errata of his 6th catalog.[36]

S5–56 – Muller said this object was identical to an object found by Stone.[37] The article containing Stone's observation was sent to the *Astronomical Journal* on October 12, 1886, so it is certain that Stone preceded Swift in the discovery. Stone's objects were labeled 113 and 114, being a double nebula.[38]

S5–57 – Muller said this object was identical to an object found by Francis Preserved Leavenworth.[39] Swift's discovery date was November 1, 1886, while the paper containing Leavenworth's observation was completed on October 12, 1886, making Leavenworth the first discoverer.[40]

S5–59 – Muller said this object was identical to an object found by Stone.[41] Swift's discovery date was October 22, 1886, while the paper containing Stone's observation was completed on October 12, 1886, making Stone the first discoverer.[42]

S5–64 & **S5–65** – Nothing is found at the positions given by Swift; however, Corwin notes that if a correction of 5 min eastward were made for both, their identities would be NGC 1659 and NGC 1667. Dreyer suggested S5–65 was identical to NGC 1667 in the "Notes and Corrections to the New General Catalogue" section of his *Second Index Catalogue of Nebulae and Clusters of Stars, containing objects found in the Years 1895 to 1907* (1908).[43]

S5–66 – Muller said Swift's object was identical to an object found by Leavenworth.[44] Leavenworth's observations of this object were originally published

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[34] F. Muller, "Dr. Swift's Fifth Catalogue of New Nebulae," *Sidereal Messenger*, **6** (1887 Feb.), p. 84.

[35] S. W. Burnham, *Memoirs of the Royal Astronomical Society*, **44** (1879), p. 198.

[36] L. Swift, "Catalogue No. 6 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **117** (1887 Aug. 13), p. 221.

[37] F. Muller, "Dr. Swift's Fifth Catalogue of New Nebulae," *Sidereal Messenger*, **6** (1887 Feb.), p. 84.

[38] "List of Nebulas Observed at the Leander McCormick Observatory, and Supposed to be New," *Astronomical Journal*, **7** (1886 Nov.), p. 11.

[39] F. Muller, "Dr. Swift's Fifth Catalogue of New Nebulae," *Sidereal Messenger*, **6** (1887 Feb.), p. 84.

[40] O. Stone, "List of Nebulas Observed at the Leander McCormick Observatory, and Supposed to be New," *Astronomical Journal*, **7** (1886 Nov. 24), p. 11.

[41] F. Muller, "Dr. Swift's Fifth Catalogue of New Nebulae," *Sidereal Messenger*, **6** (1887 Feb.), p. 84.

[42] O. Stone, "List of Nebulas Observed at the Leander McCormick Observatory, and Supposed to be New," *Astronomical Journal*, **7** (1886 Nov. 24), p. 11.

[43] J. L. E. Dreyer, *Second Index Catalogue of Nebulae and Clusters of Stars, containing objects found in the Years 1895 to 1907, with Notes and Corrections to the New General Catalogue and to the Index Catalogue for 1888–84*. London: Royal Astronomical Society (1908), p. 369.

[44] F. Muller, "Dr. Swift's Fifth Catalogue of New Nebulae," *Sidereal Messenger*, **6** (1887 Feb.), p. 84.

in November 1886 by Stone;[45] however, Leavenworth's discovery date was pinned down by Corwin, who acquired a copy of a sketch of this object from Leander McCormick Observatory. A note on the cover sheet says, "Drawn Nov 15 from sketch of Nov 12 '85." It also includes the initials, "F. P. L.," which are those of Leavenworth.[46]

S5–70 – Same as S4–35.

S5–76, **S5–78**, **S5–79**, & **S5–80** – Swift found these four nebulae on September 25, 1886, and indicated that they formed a close group, which included two other nebulae listed in his 4th catalog (see S4–55 and S4–56). Swift added that other nebulae were suspected.[47] Swift's positions do not perfectly match those of other galaxies in the area; however, his descriptions and reasonable suppositions have allowed Corwin to determine the identities of five of the galaxies. The Swift object that remains a problem is S5–80, which Dreyer labeled as NGC 6477. Corwin said the declinations of the six galaxies do provide a pattern which enabled him to strongly suspect PGC 2702901 was NGC 6477; however, Gottlieb states that this galaxy appeared as a "marginal object" in his 17.5-inch reflector and still "challenging" in his 24-inch reflector. Therefore, Gottlieb believes PGC 2702901 is too faint to have been seen in Swift's 16-inch refractor.

S5–77 – Nothing is at Swift's position. Corwin says Swift's description fits galaxy CGCG 340–017 (PGC 60659), which is located 12 s west and 38 arc minutes north of Swift's position.

S5–81 – Same as S4–59. Errata was applied to the description.[48]

S5–85 – Same as S5–86.

S5–86 – Same as S5–85.

S5–92 – Same as S4–80.

S5–95 – Same as S4–92.

S5–100 – Same as S4–96.

S6–1 & **S6–2** – Both of these objects were independently found by Swift and F. Muller. Although a precise discovery date is given by Swift (November 21, 1886), only the year was given by Muller (1886), so it is not known who preceded who in the discovery.

S6–5 – Same as S10–1.

S6–14 & **S6–15** – These two objects were discussed in chapter 8. Swift was convinced that S6–14 was the great comet of January 1887 and this probably explains why Dreyer never gave it a designation in his *New General Catalogue*. Dreyer designated S6–15 as NGC 1392. S6–14 was actually 3° south of the predicted position of that comet when the observation was made and Swift's observation has never been accepted. During the next few months, Swift made a couple of attempts to find

[45] O. Stone, "List of Nebulas Observed at the Leander McCormick Observatory, and Supposed to be New," *Astronomical Journal*, **7** (1886 Nov. 24), p. 11.

[46] H. G. Corwin, Jr., correspondence with G. W. Kronk (2017 May 28).

[47] L. Swift, "Catalogue No. 5 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **116** (1886 Dec. 18), pp. 35–36.

[48] L. Swift, "Catalogue No. 8 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **122** (1889 Aug. 24), pp. 245–246.

both of these objects, but never saw them again. Barnard (Lick Observatory) sent a letter to the *Astronomische Nachrichten* on November 19, 1887, that described his search for these objects. Using a 6.4-inch refractor, he swept around the positions given by Swift on the night of November 15. Nothing was seen at Swift's positions, but he did find two objects, now known as NGC 1316 and NGC 1317, almost exactly 15 min to the west. He said, "as the declination agrees pretty well …and the descriptions are identical, it seems to me that these are Swift's objects."[49] Swift observed Barnard's objects and said, "they bear about as much resemblance to mine as the Orion nebula does to the Andromeda nebula."[50] Although it is tempting for the Author to say that Swift simply observed NGC 1316 and NGC 1317, Swift's comment about them looking nothing like his objects brings me to list both as missing.

S6–18 – This object was independently found by Swift and Leavenworth. Swift gave the discovery date as December 22, 1886. Leavenworth's observation appeared in a paper that was sent to the *Astronomical Journal* on January 26, 1887. Since a previous paper containing Leavenworth's observations was sent to the same journal in October 1886, this particular observation could have been made anytime between October 1886 and January 1887.

S6–25 – Nothing is at Swift's position. Gottlieb found that UGC 3392 (PGC 18374) is located 30 arc minutes south of Swift's position and the description matches.

S6–53 & **S6–55** – Swift frequently sent Dreyer the details of his nebulae prior to publication in a journal. For some reason, S6–53 and S6–55 were not sent to Dreyer ahead of their publication in the *Astronomische Nachrichten*.[51] When Dreyer saw Swift's paper, his *New General Catalogue* was already "in the press;" however, Dreyer was able to include these two objects in that catalog's appendix.[52] Swift was concerned that they would be overlooked and included them in his seventh catalog (S7–30 and S7–31), which was published in September 1888.[53] Dreyer included these two objects in his first *Index Catalogue*, which was published in 1895, noting that they both came from Swift's sixth catalog.[54] Despite all of this, these objects are considered lost. S6–53 is the same as S7–30, while S6–55 is the same as S7–31.

S6–63 – Errata was applied to the description.[55]

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[49] E. E. Barnard, "Ueber Nr. 14 und 15 des Swift′schen Nebelcatalogs Nr. 6 in A. N. 2798," *Astronomische Nachrichten*, **118** (1887 Dec. 24), pp. 173–174.

[50] L. Swift, "Schreiben von Prof. Lewis Swift, Director des Warner Observatory, Rochester, N. Y.," *Astronomische Nachrichten*, **118** (1888 Jan. 5), pp. 203–204.

[51] L. Swift, "Catalogue No. 6 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **117** (1887 Aug. 13), pp. 219–220.

[52] J. L. E. Dreyer, *New General Catalogue of Nebulae and Clusters of Stars*. London: Royal Astronomical Society (1888), p. 235.

[53] L. Swift, "Catalogue No. 7 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **120** (1888 Sep. 26), pp. 35–36.

[54] J. L. E. Dreyer, *Index Catalogue of Nebulae found in the Years 1888 to 1894, with Notes and Corrections to the New General Catalogue*. (London: Royal Astronomical Society (1895), p. 265.

[55] L. Swift, "Catalogue No. 8 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **122** (1889 Aug. 24), pp. 245–246.

S6–70 – Although a different galaxy is assigned to this number in some lists, Gottlieb points out that Bigourdan "caught Swift's error" in 1894 and measured an accurate position. Gottlieb said this galaxy is actually UGC 9602 (PGC 53379), which is located 20 s east and 9 arc minutes north from Swift's position. It also fits Swift's description.

S6–92 – The right ascension in Swift's 6th catalog was erroneous; however, he had sent the correct right ascension to Dreyer and this was published in the *New General Catalogue*.

S7–8 – Same as S11–56.

S7–9 – Same as S2–30.

S7–16 – The generally accepted object that Swift found is PGC 34871; however, Swift noted that his object was in the same 32′ field of view as NGC 3605, NGC 3607, and NGC 3608. PGC 34871 is not in that field. Thomson suggests that Swift made a 5 min error in right ascension and that PGC 34419 is actually identical to Swift's object. It perfectly matches Swift's description and is brighter than PGC 34871. PGC 34419 is due south of the three NGC objects and in the same field of view.

S7–19 – Although this object was assumed lost, Corwin noted that Swift's position was exactly 5 min east of NGC 4198. Although the description matches very well, Corwin notes one issue with this link. There is a star north of NGC 4198 and a brighter one to the south. Corwin wondered why Swift would note the fainter star and suggested that, besides making an error in the right ascension, he also made an error in the direction of the most notable nearby star.

S7–27 – Corwin said this object is probably equal to galaxy IRAS F12477–0505 (PGC 170209), which is located 3 s east and one arc minute north of Swift's position.

S7–30 & **S7–31** – Swift wrote: "These are numbers 53 and 55 of list VI, which inadvertently were not sent to Dr. Dreyer, and, therefore, are not incorporated in the body of the NGC, but are in the appendix and, being liable to be overlooked, are inserted here."[56] For a more detailed story, see S6–53.

S7–33 – This is very likely PGC 48286, which is 20 arc minutes north of Swift's position.

S7–35 – Although most sources have identified IC 945 with CGCG 336–019, Corwin says CGCG 336–018 (PGC 48867) is "twice as large and twice as bright" and three arc minutes away. He adds, "the idea that he should sweep up the fainter object while missing the brighter one … is difficult to accept." Steinicke, and Seligman also link IC 945 to PGC 48867.

S7–36 – Same as S8–76.

S7–37 – Same as S8–77.

S7–38 – Same as S8–78.

S7–50 – Same as S7–51.

S7–51 – Same as S7–50.

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[56] L. Swift, "Catalogue No. 7 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **120** (1888 Sep. 26), pp. 37–38.

S7–69 – Same as S3–88.

S7–70, **S7–71**, & **S7–72** – Swift wrote: "After the completion of my improved method of reading right ascension directly from the circle, I remeasured the members of this interesting group, and am enabled to identify M. Stephan's 3, which are NGC 6040, 1, 2. His places are in close agreement with mine. During the process, two others were detected, with the probability that one in my list IV was not again seen, if so, the [number] observed is 13 in a field of 30′."[57] S7–71 is the same as S4–26.

S7–82, **S7–83**, **S7–84**, and **S7–86** – Errata were applied to the description.[58]

S7–95 – Same as S8–96.

S7–97 & **S7–98** – Swift wrote: "These together with NGC 6646, are in finder field with Vega. The three are near together and exactly in line, with 6646 in the middle. Strange, [Herschel] missed 97, as it is as bright as his own, though very much smaller. Not at all surprising however that he failed to notice 98, as it is a very difficult object with me, though Prof. Barnard with the 12 inch at the Lick Observatory, pronounces it easy, showing the superiority of his atmospheric conditions over my own."[59]

S8–2 – Corwin's analysis suggests PGC 10737 was the galaxy that Swift saw; however, he initially believed this galaxy was too faint for Swift to see. This changed when Gottlieb was able to see the object in 1987 using his 17.5-inch reflector. Gottlieb noted, "Swift has a few other faint discoveries in the same ballpark."

S8–3 – F. W. Herschel found this object in 1786, but never included it in his published catalog. Gottlieb found the details in the notes of Herschel's sweeps, with Herschel's description matching this galaxy.

S8–19 – Same as S8–21.

S8–21 – Same as S8–19.

S8–31 – Corwin says that Swift's position is "pretty good" and Swift's statement that this object is "one of 3 in a line" helps establish the identity. The galaxy NPM1G +41 (PGC 12430) is "the northern-most of the line of three (the other two are NGC 1277 and 1278)."

S8–32 – Corwin has said that this object was actually an independent discovery by Swift. Dreyer had found the nebula 13 years before Swift and when Swift sent the details to him in 1888, Dreyer was apparently unable to decide whether this was another observation of his object or not. Swift's position was good and the description was good except for one thing. Swift said this nebula was a close double with NGC 1276. It was actually a close double with NGC 1278.

S8–40 & **S8–41** – Swift wrote: "During an almost momentary use of the 12 inch at the Lick Observatory, I detected four nebulae in one field. In response to my query if he could see them, Prof. Barnard replied that he could see six. He gave

[57] L. Swift, "Catalogue No. 7 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **120** (1888 Sep. 26), pp. 37–38.

[58] L. Swift, "Catalogue No. 8 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **122** (1889 Aug. 24), pp. 245–246.

[59] L. Swift, "Catalogue No. 7 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **120** (1888 Sep. 26), pp. 37–38.

me the places of two of mine nos. [S8–38 & S8–39]. Arriving home too late and the weather being unfavorable, I was unable to get positions of the other two as I expected."

"From their low altitude and the interference of the electric street lights, it is doubtful if I shall ever be able to see them from here, and, therefore I shall be obliged to depend on the kindness of Prof. Barnard for their places, when they shall again come into favorable position."[60]

S8–47 – Nothing is at Swift's position; however, 10 arc minutes to the south is NGC 2590 and Swift's description fits.

S8-48 – See S8-75.

S8–50 – Corwin suggests that Swift's object is MCG-02–26-005 (PGC 28702). Swift's right ascension is almost identical to this galaxy, but his declination is 23 arc minutes to the south. Corwin considers this "the only reasonable candidate" and the identification has been adopted by others.

S8–53 – Same as S8–54.

S8–54 – Same as S8–53.

S8–55 – Corwin suggests that UGC 5735 (PGC 31235) is what Swift saw. Swift's detailed description fits. Swift's position is 19 s east and 20 arc minutes south of this object.

S8–56 – Corwin and Thomson agree that this is identical to NGC 3649. Swift's position is 1 min to the west.

S8–61 – Dreyer labeled this object as IC 755 and it is an edge-on galaxy. J. F. W. Herschel discovered an object in 1832, which Dreyer labeled as NGC 4019, but there is nothing at his position. There is some debate as to whether these two objects are identical or not, which affects the "Original Discoverer" listing in the table. Corwin has suggested that IC 755 is identical to NGC 4019, based on the descriptions of Herschel and Swift. Corwin re-reduced the position determined by Herschel and found it offset from IC 755 by 20 s in right ascension and 6 arc minutes in declination.[61] Thomson disagrees with Corwin's conclusion, noting that two additional objects found by Herschel on the same night have excellent positions. Thomson points out that Herschel noted a 9th-magnitude star 5 min to the south and following his object. He adds that there is such a star at the appropriate distance and direction from Herschel's position. Corwin acknowledges Thomson's argument and says, "This throws a little doubt on the IC 755 identity, but requires that [Herschel's] object be a comet. This is a possibility, but I think that the equality with IC 755 is more likely."

S8–62 – Swift's position is 6 arc minutes north of PGC 40092.

S8–67 – Swift's position is 22 s east and 2 arc minutes north of PGC 45234.

S8–68, **S8–69**, & **S8–70** – These three have been the subject of much debate, with the strongest arguments coming from Corwin and Thomson; however, they do

[60] L. Swift, "Catalogue No. 8 of Nebulae discovered at the Warner Observatory," *Astronomische Nachrichten*, **122** (1889 Aug. 24), pp. 245–246.

[61] H. G. Corwin, Jr., correspondence with G. W. Kronk (2017 May 14).

not perfectly agree on the identities. It is obvious that Swift saw these objects, but they are so close and Swift's positions are bad. The identities presented in the table were established by the Author.

S8–74 – Nothing is at Swift's position; however, Corwin says his position is almost exactly 1 min of right ascension east of NGC 5136. Swift's declination and description fits this galaxy.

S8–75 – In August 2017, a key identification of one of Swift's objects was made by Gottlieb. He found that if Swift's object number 75 in his 8th catalog, which was found on September 1, 1888, was corrected by 10 minutes in right ascension, it matched NGC 5273, both in position and description. After reporting this to Corwin, Corwin examined the positions of the 81st and 82nd objects in Swift's 8th catalog, which were found the same night. The first had previously been identified as PGC 52005, even though Swift's description did not perfectly match, while the second was listed as missing. Corwin applied Gottlieb's correction and found that object 81 matched NGC 5739, while object 82 matched PGC 52995. The matches included both the positions and descriptions. Corwin reported these new identifications to several people, one of whom was Seligman. Seligman decided to check the fourth object found by Swift on this night, object number 48 in the 8th catalog. Although it had previously been identified as PGC 24397, the application of a 10-minute correction in right ascension caused it to match the position and description of NGC 2646. So, the problem of two objects that had been missing for over a century and two poorly matched objects has been resolved. The solution indicates that Swift had not calibrated his telescope properly on September 1, 1888, leading to an identical error of 10 minutes in right ascension for all four objects.

S8–76 – Same as S7–36.

S8–77 – Same as S7–37.

S8–78 – Same as S7–38.

S8-81 – See S8-75.

S8-82 – See S8-75.

S8–85 – Swift's position is 20 arc minutes north of galaxy PGC 54063.

S8–86 – Although many sources list this as identical to the galaxy UGC 9800, Corwin thinks the odd differences in position (1 min 38 s in right ascension and 2.7 arc minutes in declination) and that galaxy's faintness would rule it out, especially since Swift described it as pretty bright. Corwin suggests the better link would be NGC 5876, which Swift first discovered in 1885. Although Swift's position is 5 min east of this galaxy, it is over two magnitudes brighter and forms a triangle with two other stars, as his description states. Same as S1–43.

S8–89 – This object is either identical to PGC 55648 or IC 1125. Corwin's argument for the latter are the reasonable errors of 5 min in right ascension and five arc minutes in declination; however, the Author notes several stars of magnitude 10.2–11.5 toward the west and north that Swift would have typically mentioned. Many other people have accepted the identity with PGC 55648, which is 12 arc minutes south of Swift's position. Although the main problem with this is the proximity to PGC 55640, the Author has examined this field from his observatory and notes that

PGC 55640 is small enough so that it initially looks like a star. So, the galaxy PGC 55648 is accepted as the object Swift saw.

S8–92 – Same as S9–73.

S8–96 – Same as S7–95.

S9–2 – Same as S11–18.

S9–3 – Same as S10–12.

S9–7 – It is generally agreed that this object is identical to PGC 7683. Swift's position is roughly 20 s east and 30 arc seconds south of this galaxy. Although Swift described the galaxy as round, it is actually elongated. It is possible that only the prominent round center was seen by Swift.

S9–13 – Swift wrote: "In description of nebula no. 13 for 'passed' read '1st of 3'. Calling attention to apparently so trivial a matter may seem unimportant, but it has more significance than at first sight appears, as I strongly suspect it to have been a comet, as at two subsequent examinations it could not be found. It was in line with N. G. C. 1417 and 1418 and all three were seen simultaneously."[62] Writing in the journal of *Astronomy and Astro-Physics* in 1892, Swift said that other astronomers had seen this object, but with difficulty. Swift said he took another look on January 31, 1892. He said, "The two with which it was in line, were easily seen, but not even a glimpse of the other, using a power of 132. Changing the eye-piece to one giving a power of 195, I, after a prolonged endeavor, gained two glimpses of the object but they almost instantly vanished." Swift added that the object "was not exactly in line with the other two but a little north, agreeing with Sir John Herschel's observation."[63]

S9–32 – There is nothing at Swift's position. The generally accepted identification is galaxy PGC 36626, which is about 40 s west of Swift's position. The magnitude of this galaxy is 15.0–15.6. Swift describes this as very faint, but other galaxies of this magnitude were typically described by Swift as excessively faint. Pothier came up with a better solution in 2016. He suggests the galaxy UGC 6726 (PGC 36613) as the likely candidate, which Corwin also favors. This galaxy is about magnitude 13.7 and is located about 50 s east and 10 arc minutes north of Swift's position.

S9–37 – Same as S11–151.

S9–39 – It is generally agreed that this object is identical to NGC 5360, as the position is very close and the description matches. Nevertheless, Corwin brings up a good point and that is why Swift did not mention nearby NGC 5364, which is brighter. Corwin also notes that Marth discovered NGC 5360 a few years before Swift and also failed to mention NGC 5364.[64]

S9–42 – There is nothing near Swift's position. Corwin notes that Swift's description fits that of UGC 9617 (PGC 53402), except that the pretty bright star is close to the following end instead of the preceding end. Swift's position is 50 arc minutes south of this galaxy.

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[62] L. Swift, "Erratum to 'Catalogue No. 9 of Nebulae, in A. N. 3004," *Astronomische Nachrichten*, **126** (1891 Jan. 19), pp. 225–226.

[63] L. Swift, "Discovery of Nebulae," *Astronomy and Astro-Physics*, **11** (1892), p. 198.

[64] H. G. Corwin, Jr., correspondence with G. W. Kronk (2017 May 17).

S9–53 & **S9–54** – Corwin said Swift sent correct positions directly to Dreyer, but reversed the declinations in his 9th list. The south preceding comment for S9–53 and north following comment for S9–54 confirm the actual declinations.

S9–69 – Several sources simply list this object as missing; however, Corwin suggests this was identical to IC 1226, while Seligman suggests it was a reflection of the 5th-magnitude star 52 Herculis. Interestingly, in 2016, Pothier wrote to Corwin with the suggestion that this was the double galaxy PGC 59071/2. Although it is located 38 arc minutes north of Swift's position, Corwin states that this could have been a 40 arc minute error on Swift's part, with the drive failure contributing unknown errors. Corwin also notes that Pothier's suggestion fits Swift's description.

S9–70 – Nothing is at this position; however, Dreyer suggested this was identical to NGC 6247, which was first discovered by d'Arrest. Swift's position is 10 arc minutes north of this galaxy and the description fits.

S9–72 – Howe examined this position on two nights, noting "five 12-14 mag. stars in a line, at an angle of 0°, the length of the line being 45."[65] Thomson later described the same asterism as "the form of a question mark … turned backwards."

S9–73 – Same as S8–92.

S9–81 – Same as S1–65.

S9–93 – This object is now generally accepted to be identical to IC 4867, which is located 50 arc minutes north of Swift's position. Swift's description fits.

S9–95 – Corwin describes this object as "an asterism of about ten faint stars located in the middle of a 'trapezium' of four pretty bright stars."

S9–99 – Swift apparently made a mistake in the description, stating that this object was not "4659". This object is from J. F. W. Herschel's *General Catalogue* and is no where near Swift's position. In reality, this should be "4956," which is NGC 7653.

S10–1 – Same as S6–5.

S10–6 – Thomson noted Swift's position was 20 arc minutes south of PGC 6292.

S10–7, **S10–8**, **S10–9**, & **S10–10** – The identification of these four objects was announced in April 2017. Gottlieb suggested IC 153 is UGC 1260 (PGC 6633) and IC 157 is UGC 1274 (PGC 6670) assuming Swift made a 4 min error in recording the right ascension. He added that Swift's descriptions matched. Corwin then suggested that IC 151 is UGC 1271 (PGC 6657) and IC 152 is NGC 677, assuming Swift made a 5 min error in recording the right ascension. Swift's descriptions also matched.

S10–11 – Swift's position is 10′ south of PGC 6643.

S10–12 – Same as S9–3.

S10–14 – Same as S2–29.

S10–15 – Same as S11–88.

S10–21 – Although this object has typically been associated with UGC 8361 (PGC 46342), because of its closeness to Swift's position, Corwin has suggested that UGC 8349 (PGC 46250) is a better candidate for two reasons. First, Swift noted

[65] H. Howe, "Observations of Nebulae," *Monthly Notices of the Royal Astronomical Society*, **58** (1898), p. 521.

that NGC 5060 was in the same field as his object. That fits UGC 8349, but not UGC 8361. Second, object S10–26, which was found the same night by Swift, required a correction of 1 min 18 s in right ascension to link it to IC 1016 (see S10–26 for details). If this same correction was made to S10–21, Swift's position lands on UGC 8349.

S10–26 – Nothing is at Swift's position; however, Corwin points out that if Swift's right ascension was adjusted 1 min 18 s to the east it points to IC 1016, which has a matching declination and description.

S10–33 – Although some sources credit Swift with this discovery, Gottlieb says this should be changed to Barnard. Barnard found this object 10 days prior to Swift, while searching for comet 14P/Wolf. According to Gottlieb, "Barnard never published the discovery or informed Dreyer, so Swift is credited with the discovery …." Gottlieb discovered this observation while looking through Barnard's logbooks at Lick Observatory.

S10–34 – Although some sources credit Swift with this discovery, Gottlieb says this should be changed to Barnard. Barnard discovered this object about 2 months prior to Swift. Barnard did not publish the discovery or notify Dreyer. Gottlieb discovered this observation while looking through Barnard's logbooks at Lick Observatory.

S10–47 – In a letter written to Howe, Swift corrected the North Polar Distance that Dreyer gave for this object by 1°.[66] Same as S2–80.

S10–59 – Although some sources credit Swift with this discovery, Gottlieb says this should be changed to Barnard. Barnard found this object almost 2 years prior to Swift, while searching for comet 16P/Brooks. According to Gottlieb, Barnard did not publish the discovery or notify Dreyer. Gottlieb discovered this observation while looking through Barnard's logbooks at Lick Observatory.

S10A-1 – There is nothing at Swift's position; however, Corwin, Steinicke, and Thomson all agree that this object is probably identical to IC 555, which is 7 s east and 8 arc minutes south of Swift's position. IC 555 was found by Javelle 6 days prior to Swift's discovery. Seligman states that this identity is probably not legitimate and adds that "the descriptions of the two objects are completely different." The Author notes that Javelle described the object as "pretty bright, very small, round, brighter middle," while Swift describes it as "excessively faint, extremely small, almost stellar." Javelle was using a 30-inch refractor, while Swift was using a 16-inch refractor. The object would have appeared brighter to Javelle than to Swift. Swift used an eyepiece that gave him a much wider field of view. So, if Javelle described it as "very small," Swift's noting that it was almost stellar seems to be what would be expected. Interestingly, the galaxy is actually elongated, with a bright center.

S10A-4 – Same as S11–168.

S10A-5 – Same as S11–169.

S10A-6 – Same as S11–173.

S10A-7 – Same as S11–174.

S10A-8 – Same as S11–182.

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[66] H. Howe, "Observations of Nebulae made at the Chamberlin Observatory, University Park, Colorado," *Monthly Notices of the Royal Astronomical Society*, **61** (1900 Nov.), p. 48.

S11–2 – Swift wrote: "This with its associated companion is a remarkable nebula. I am undecided as to whether it is all one, or consisting of two, the preceding half very very bright, very large exceedingly elongated as Sir John Herschel describes it, and the following half exceedingly faint, very large, exceedingly elongated, partly overlapping the other. I am inclined to think they are two distinct nebulae, one reason being that the brighter ends sharply, which would be improbable if the brighter merged into the fainter. The brighter was discovered by Dunlop, but he could not have seen the fainter. As Sir John Herschel does not mark it with a sign as being a remarkable object, lends plausibility to the idea that it was not seen even by him."[67] It is now generally accepted that this is a bright knot of material in the east-southeast arm of NGC 55.

S11–4 – Nothing is at Swift's position. Corwin believes that MCG-02-02-059 (PGC 2100) is what Swift saw. The galaxy is about 6 s west and 13 arc minutes north of Swift's position.

S11–6 & **S11–27** – Swift wrote: "These are very singular nebulae, and are new experiences to me. They resemble a pretty bright double star, each component being an exceedingly small nebulous disk, like an imaginary double nebulous Uranus, distant about 5″ or 6″."[68] The general consensus among astronomers is that both of these objects really are double stars, which appeared hazy or diffuse to Swift because they were observed at a low altitude. For S11–6, there is a fairly good candidate, which is given in the table. For S11–27, there are several candidates, one of which is NGC 749. Corwin, Steinicke, and Thomson all rule out NGC 749, because it does not fit Swift's description. One of the double star candidates is fairly close to Swift's position, but Thomson states that the fainter star may have been too faint for Swift to see. Corwin and Steinicke have chosen the candidate that is given in the table. It is located nearly 2.5 min west and nearly 8.5 arc minutes south of Swift's position.

S11–14 – Same as S11–15.

S11–15 – Same as S11–14.

S11–17 – There is nothing at Swift's position; however, about 20 s west and three arc minutes north is a pair of galaxies that should have been easy targets for Swift. The galaxies are almost touching in photographs.

S11–18 – Same as S9–2.

S11–27 – See S11–6.

S11–29 – Same as S11–30.

S11–30 – Swift gave a declination that was exactly 1° in error in his 11th catalog. Astronomers recognized the error because the star "Cordoba 681" was 1° further south of the given position. Swift actually gave the correct declination, near the indicated star, in his preliminary 5th list from Lowe.[69] This means that Swift saw IC 1759, which is S11–29.

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[67] L. Swift, "Catalogue No. 11 of Nebulae," *Astronomische Nachrichten*, **147** (1898 Sep. 6), p. 217.

[68] L. Swift, "Catalogue No. 11 of Nebulae," *Astronomische Nachrichten*, **147** (1898 Sep. 6), p. 218.

[69] L. Swift, "List No. 5 for 1900.0 of Nebulae," *Astronomische Nachrichten*, **145** (1898 Feb. 7), pp. 283–284.

S11–34 – Swift wrote: "This appears like a nebulous double star, but I think it is simply a double star in a nebula. There is a vast distance between a nebulous star, and a star in a nebula."[70]

S11–40 – Nothing exists at Swift's position; however, NGC 964 is 45 s east and 38 arc seconds north of his position. Swift's description matches NGC 964.

S11–44 – There is nothing at Swift's position. There are two identifications that have been suggested. Lauberts first suggested this is a double star in the ESO-B Atlas and Corwin agrees, pointing out that there is another "double star north preceding." Corwin adds that Swift's position is just 1 min to the east. But Lauberts also suggested (with a question mark) that ESO 416-G015 (PGC 10441) might be what Swift saw. Thomson believes this is a likely candidate. He points out that Swift found three additional objects on the same night and that they are offset from galaxies by 37–44 s of right ascension to the west. Swift's position for S11–44 is 42 s west of ESO 416-G015. Thomson points out that it is bright enough for Swift to have seen. This latter identity has been adopted.

S11–55 – Although nothing is at Swift's position, Corwin suggests Swift made a 10 min error in right ascension and that this is NGC 1411. He said the declination and description fit. Several others arrive at the same conclusion.

S11–56 & **S11–81** – Swift wrote: "These in one respect are the most interesting nebulae I have ever seen, especially No. 56, which is a nebulous hair-line of one uniform size from end to end. No. 81 at first view seemed identical with it, but on a closer view the center seemed to have a very slight bulging in the middle."[71] S11–56 is the same as S7–8. S11–81 is the same as S11–82.

S11–59 – In reviewing many different sources, the Author has found that this object has been linked to NGC 1415 and NGC 1416. A few sources even list it as missing, but this does not seem a viable option considering there is a candidate both above and below Swift's position. Both of these galaxies have good and bad points. NGC 1415 is closest to Swift's position, being 3.5′ to the northwest, but it is noticeably elongated, while Swift said his object was round. NGC 1416 is located 6.9′ south of Swift's position. It is round, but it would then be necessary to explain why Swift missed NGC 1415, which is larger and one magnitude brighter. Corwin, Steinicke, and Gottlieb favor NGC 1415 and this is the accepted identity in the table.

S11–60 – In his "Notes and Corrections to the Index Catalogue 1988-1894," at the end of his Second Index Catalog, Dreyer admits to making a mistake in the position of IC 346 and then adds that IC 346, "Is no doubt identical" with S11–60."[72]

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[70] L. Swift, "Catalogue No. 11 of Nebulae," *Astronomische Nachrichten*, **147** (1898 Sep. 6), p. 218.

[71] L. Swift, "Catalogue No. 11 of Nebulae," *Astronomische Nachrichten*, **147** (1898 Sep. 6), pp. 218–219.

[72] J. L. E. Dreyer, *Second Index Catalogue of Nebulae and Clusters of Stars, containing objects found in the Years 1895 to 1907, with Notes and Corrections to the New General Catalogue and to the Index Catalogue for 1888–84*. London: Royal Astronomical Society (1908), p. 377.

S11–61 – The 11th catalog gives a discovery date of October 14, 1897, which is given in the table; however, Swift provided a different discovery date of October 3, 1897, in earlier papers listing this object.[73]

S11–64 – Same as S11–65.

S11–65 – Same as S11–64.

S11–68 – Same as S11–69.

S11–69 – Swift's discovery date of December 10, 1895, was given in his 11th catalog and this is what is provided in the table; however, Swift's earlier, preliminary paper gives the discovery date as October 5, 1896.[74] Same as S11–68.

S11–70 – There is nothing in the indicated position; however, as noted by Thomson and Steinicke, there is a galaxy that could have been seen by Swift 16 arc minutes south of the given position. So, this galaxy is identified as Swift's object.

S11–78 – This object is missing; however, Corwin says this is identical to S11–79. He wrote, "The descriptions are similar, the positions are within Swift's usual errors, and he mentions the nearby bright star in both descriptions."[75]

S11–79 – Swift's position is very close to PGC 17402; however, the star that he likely referred to is actually south following. Same as S11–78.

S11–81 – Same as S11–82. See S11–56 for more information.

S11–82 – The fact that Swift mentioned that NGC 1963 preceded this object, indicates that Swift made a declination error of +10°. The correction essentially places it in the same position as S11–81.

S11–83 & **S11–84** – Corwin and Thomson have provided excellent analyses indicating that these two objects are one and the same. Both point out that S11–83 has an error in the description, noting that Swift said his object was south following "NGC 1980." This particular galaxy has a declination 17° north of S11–83. The description should have read that it was south following NGC 1979, because that galaxy is near the position Swift gave for S11–83. S11–84 has a correct description in that it refers to NGC 1979; however, it suffers an error of 10 arc minutes in declination. Both of Swift's descriptions refer to a bright star nearby, although that for S11–83 said the star precedes Swift's object. The description for S11–84 is correct in stating that the star follows his object by 10 s.

S11–86 – Although nothing is found at the position given by Swift, Corwin suggested identity with the galaxy ESO 424-G013 (PGC 17662), which is 4.3 min to the west. He added that Swift's description "makes the identity clear."

S11–88 – Same as S10–15.

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[73] L. Swift, "List No. 5 of Nebulas Discovered at Lowe Observatory," *The Astronomical Journal*, **18** (1897 Dec. 24), p. 111; L. Swift, "List No. 5 for 1900.0 of Nebulae," *Astronomische Nachrichten*, **145** (1989 Feb. 7), pp. 283–284.

[74] L. Swift, "Catalogue No. 1 for 1900.0 of Nebulas," *The Astronomical Journal*, **17** (1896 Nov. 13), p. 28.

[75] H. G. Corwin, Jr., correspondence with G. W. Kronk (2017 May 17).

S11–91 – Swift wrote: "This is also a singular object, one side extending like a brush. I have never seen but one like it, which I think is in Monoceros."[76] It should be noted that the star in contact with this object is actually south following.

S11–97 – Same as S11–98.

S11–98 – Same as S11–97.

S11–99 – Same as S11–100.

S11–100 – Same as S11–99.

S11–108 – Howe wrote that he "could not see Swift 108." He then noted that NGC 3260 was close to Swift's position and there was a magnitude 11.5 star nearby, which would match Swift's description of a star in contact with S11–108. Howe wrote, "I judge them to be identical."[77] In the notes for the *Second Index Catalogue of Nebulae*, Dreyer stated that this was "no doubt" identical to NGC 3260 and no "IC" number was assigned.[78] Corwin adds that Swift must have made a mistake by stating that this object was close to NGC 3267. In reality, this object was close to NGC 3258.

S11–115 – Howe received a letter from Swift that said this nebula "is evidently identical"to NGC 3333.[79] Swift's position is very close, although it is interesting that he said that at "first glance" this looked like a double star.[80]

S11–124 – Nothing is at Swift's position, but NGC 3957 lies 3.5 min to the east and the description fits.

S11–125 – Nothing is at Swift's position; however, PGC 37196 lies almost exactly 9 arc minutes to the south and Swift's description fits.

S11–129 – Same as S3–61.

S11–131 – Same as S11–133.

S11–133 – Same as S11–131.

S11–141 – Gottlieb notes that the comment "NGC 4732 in field" was impossible and points out that Corwin "notes he probably was referring to NGC 4686." This makes IC 3791 = NGC 4695.

S11–144 – Swift sent papers containing the details of this nebula to three different publications. Although this was not unusual for Swift after moving to Lowe Observatory, it is strange that the declination is different in each publication. For comparison, the Author has converted the equinox of the following positions from 1900.0 to 2000.0. Swift gave the right ascension as $\alpha = 12^h\ 51^m\ 23^s$ in all three cases, but gives the declination as $\delta = -30^h\ 00^m\ 14^s$, in the *Monthly Notices of the Royal*

[76] L. Swift, "Catalogue No. 11 of Nebulae," *Astronomische Nachrichten*, **147** (1898 Sep. 6), p. 219.

[77] H. Howe, "Observations of Nebulae made at the Chamberlin Observatory, University Park, Colorado," *Monthly Notices of the Royal Astronomical Society*, **61** (1900 Nov.), p. 49.

[78] J. L. E. Dreyer, *Second Index Catalogue of Nebulae and Clusters of Stars, containing objects found in the Years 1895 to 1907, with Notes and Corrections to the New General Catalogue and to the Index Catalogue for 1888–84*. London: Royal Astronomical Society (1908), p. 371.

[79] H. Howe, "Observations of Nebulae made at the Chamberlin Observatory, University Park, Colorado," *Monthly Notices of the Royal Astronomical Society*, **61** (1900 Nov.), pp. 49–50.

[80] L. Swift, "Catalogue No. 11 of Nebulae," *Astronomische Nachrichten*, **147** (1898 Sep. 6), p. 219.

Astronomical Society (MNRAS),[81] $\delta = -29^h\ 50^m\ 14^s$ in *Popular Astronomy* (PA),[82] and $\delta = -27^h\ 50.3^m$ in the *Astronomische Nachrichten* (AN).[83] To make matters worse, Dreyer published the declination from the AN in his *Second Index Catalogue*, but under the description he gives the declination from the MNRAS with a "?".[84] There are apparently two possible candidates for this object: ESO 442-G024, at $\delta = -27^h\ 47.0^m$, and ESO 442-G026, at $\delta = -29^h\ 50.4^m$. Thomson and Corwin have independently investigated this matter. Thomson favors ESO 442-G024, while Corwin favors ESO 442-G026. Swift's paper in the MNRAS does contain a piece of information not present in the other two published papers. Swift noted, "9 m * near sf." Thomson notes that ESO 442-G024 has a nearby 10th magnitude star, but it is north following instead of south following; however, this would not be the first time that Swift switched directions. Thomson adds that ESO 442-G026 has an 11th-magnitude star due south and a 9th magnitude star that is south following, but the latter would have been at the edge of Swift's field of view had the galaxy been centered. The Author is going with ESO 442-G024.

S11–146 – There is nothing at Swift's position; however, NGC 4947 is almost exactly 5 min to the east. Although a galaxy of this brightness could generally have been easily seen in his telescope, his description of it being excessively faint could have been a result of the galaxy being just barely 12° above his horizon, at best.

S11–147 – This was linked to ESO 443-G032, which indicated Swift's position was 1 min off in right ascension; however, early in 2016, Gottlieb suggested that ESO 443-G024 was the galaxy seen by Swift. Although it is further from Swift's position (30 s east and 10 arc minutes south), it fits the description better than G032, including the 10th-magnitude star nearby.

S11–151 – Same as S9–37.

S11–154 – Corwin notes that although Swift's position is a degree south of IC 879, the description that NGC 5078 is near and north following makes the identification certain.

S11–155 – Nothing is at Swift's position, but NGC 5124 is located 50 s to the east. Although it is not round, there is a trapezium near south following.

S11–156 – Swift's position is 10 arc minutes due south of NGC 5118 and his description fits.

S11–161 – Carlson identified this object, designated IC 4338 by Dreyer, with NGC 5334, which was discovered by F. W. Herschel in 1787.[85]

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[81] L. Swift, "List No. 7 of Nebulae Discovered at the Lowe Observatory," *Monthly Notices of the Royal Astronomical Society*, **58** (1898 Mar.), p. 332.

[82] L. Swift, "List No. 7 of Nebulae Discovered at the Lowe Observatory," *Popular Astronomy*, **6** (1898 Mar.), p. 20.

[83] L. Swift, "Catalogue No. 11 of Nebulae," *Astronomische Nachrichten*, **147** (1898 Sep. 6), pp. 213–214.

[84] J. L. E. Dreyer, *Second Index Catalogue of Nebulae and Clusters of Stars, containing objects found in the Years 1895 to 1907, with Notes and Corrections to the New General Catalogue and to the Index Catalogue for 1888–84*. London: Royal Astronomical Society (1908), p. 335.

[85] D. Carlson, *Astrophysical Journal*, **91** (1940), p. 357.

S11–162 – Swift wrote, "This is a perfect specimen of a nebulous star, and the only one I have ever found, and a beautiful one it is."[86]

S11–163 – Swift wrote that "at first glance" this looked like a double star, but with one "star" actually being a nebula.[87]

S11–168 – Same as S10A-4.

S11–169 – Same as S10A-5.

S11–172 – Swift wrote that "at first glance" this looked like a double star, but with one "star" actually being a nebula.[88]

S11–173 – Same as S10A-6.

S11–174 – Same as S10A-7.

S11–178 – Swift wrote: "This is very large, and one of my faintest. Have seen it twice, and failed once. The field is a curiosity, the following half having many stars the preceding half not even one."[89]

S11–181 – Corwin says this "is almost certainly identical with UGC 9945," which is PGC 55687, adding that Swift's description is accurate for this galaxy. He notes that Swift's position was in error by 4 min in right ascension and 6.9 arc minutes in declination.

S11–182 – There is nothing at Swift's position; however, galaxy IC 1149, which Swift discovered in 1892 (see S10A-8) is located 26 min to the east and 1.3 arc minutes to the south. The description fits.

S11–183 – There is nothing at Swift's position, but Corwin and Gottlieb point out that NGC 6132 is exactly 1° south of his position.

S11–184 – Swift wrote: "This is also a singular object. I have never seen but one resembling it, and that was on the same night, which I think is N. G. C. 6861. It looks like a close, bright double star, each component having a small, bright, round, star-like nebulous disc. A power of 200 failed to divide it."[90] Corwin suggests Swift saw a very close double star 50 s west of Swift's position in "less than perfect seeing."

S11–189 – Swift's position is about four arc minutes north. The right ascension is good and the description fits.

S11–191 – This object is missing. Some sources have linked this object to ESO 340-G011, but Corwin, Gottlieb, Seligman, Thomson, and Steinicke shed doubt on such an identity. Foremost among their concerns is the large and unusual position error, as the ESO galaxy is offset by 37 s in right ascension and 32 arc minutes in declination from Swift's position. A second concern is that Swift specifically stated that there is "no bright star near" his object, yet the ESO galaxy is about 9.5 arc minutes south of a magnitude 8.3 star, while stars of magnitude 9 to 10 are a few arc

[86] L. Swift, "Catalogue No. 11 of Nebulae," *Astronomische Nachrichten*, **147** (1898 Sep. 6), p. 219.

[87] L. Swift, "Catalogue No. 11 of Nebulae," *Astronomische Nachrichten*, **147** (1898 Sep. 6), p. 219.

[88] L. Swift, "Catalogue No. 11 of Nebulae," *Astronomische Nachrichten*, **147** (1898 Sep. 6), p. 219.

[89] L. Swift, "Catalogue No. 11 of Nebulae," *Astronomische Nachrichten*, **147** (1898 Sep. 6), pp. 219–220.

[90] L. Swift, "Catalogue No. 2, of Nebulae discovered at the Lowe Observatory, Echo Mountain, California," *Monthly Notices of the Royal Astronomical Society*, **57** (1897 Supplement), p. 631.

minutes to the east-southeast, northeast, and northwest. A third concern is that Swift described his object as very faint, whereas the ESO galaxy has a V magnitude of 11.7, which would have been bright in Swift's telescope. Concerning the latter issue, Corwin does point out that the ESO galaxy would not have reached a high altitude for Swift and would probably have suffered the effects of extinction.

S11–192 – Corwin and Steinicke suggest that this object is identical to NGC 6923. Swift's position would be in error by 6 min of right ascension and two arc minutes of declination.

S11–193 & **S11–194** – These two objects are very likely the same, with Corwin, Gottlieb, Seligman, and Thomson in agreement. Thomson goes so far as suggesting that Swift made an error of 1 min in right ascension for S11–193, which would bring his positions for these two objects closer in agreement. Steinicke believes that Swift actually saw two distinct objects and an examination of the field does reveal a 14th-magnitude galaxy almost touching the southern end of the brighter galaxy. The Author's take on this is that Swift saw the brighter galaxy on July 25, 1897 and both galaxies on August 29, 1897, which led to him describing it as a "curious object" because of the strange shape it would have presented. So, S11–193 and S11–194 are one and the same.

S11–197 & **S11–198** – Howe observed this area and found only one object. He noted that Swift's positions were separated by only 15 s in right ascension and noted that the descriptions for both of Swift's objects actually fit the single object that Howe observed. At Howe's request, Swift sent a copy of his original records, which noted that S11–197 was "sp of 2" and S11–198 was "nf of 2."[91] Corwin agrees with Howe, noting "perhaps Swift got the date wrong on one object, or he made some other error, perhaps the result of a lapse in memory." This object is also the same as S11–200, S12–18, and S12–22.

S11–199 – This object was discovered the same night as S11–197 and was subsequently rediscovered with that nebula on other nights as well. So, S11–199 is the same as S11–201, S12–19, and S12–23.

S11–200 – Same as S11–197.

S11–201 – Same as S11–199.

S11–204 – Corwin, Gottlieb, and Thomson believe this is PGC 66179, based on Swift's detailed description. This indicates that Swift's position was off by 1 min in right ascension and 16 arc minutes in declination.

S11–210 – Corwin suggested this was identical to NGC 7155 (PGC 67663) and that Swift made a declination error of 30 arc minutes. Swift's description of the field matches that of NGC 7155.

S11–212 – Corwin suggests this is NGC 7300 (PGC 69040), with "simple digit errors in Swift's position." Swift's position was 10 min west and 20 arc minutes south of NGC 7300.

S11–216 – Another empty space, but PGC 69044 is 10 min of right ascension from Swift's position and the description matches.

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[91] H. Howe, "Observations of Nebulae made at the Chamberlin Observatory, University Park, Colorado," *Monthly Notices of the Royal Astronomical Society*, **61** (1900 Nov.), p. 51.

S11–229 – Swift gave the declination of this object as −18° 36′ 0″ in his first list of objects found at Lowe Observatory, which was published in the *Astronomical Journal* in 1896[92] and then gave the declination as −19° 36.0′ in his 11th catalog published in the *Astronomische Nachrichten* in 1898.[93] Howe found an object matching Swift's description about 6′ south of the earlier published position. He wrote to Swift, who checked his original record and said both declinations were wrong and that Howe's object was what he saw.[94]

S11–230 – Gottlieb said Swift's position is nine arc minutes south of PGC 71548 and the description matches.

S11–241 – Same as S12–45.

S11–243 – The position for this object probably reflects one of the largest errors Swift ever made, at least as far we know (see the many "Missing" objects strewn throughout his catalogs). The European Southern Observatory adopted the galaxy ESO 349-G011 as Swift's object; however, several people have noted that this object could have been difficult for Swift to see and certainly would not have been described as pretty bright. Corwin admits that there is no galaxy "within several degrees of Swift's position that matches [his] description." Thomson came up with an intriguing idea. He suggests that Swift made an error of 1 h in right ascension, making it 22 h instead of 23 h. This would place Swift's object fairly close to NGC 7418, with coordinates "within his normal error of measurement." The problem is Swift's description does not fit this galaxy. The Author has chosen to list this as missing.

S12–10 and **S12–11** – Corwin suggests that these two objects might be NGC 4284 and NGC 4290, respectively. The Author did a search of a 20° by 11° area of the sky centered on Swift's position of S12–10 and it seems that NGC 4284 and NGC 4290 are the only two objects matching Swift's descriptions that are close enough together to be seen in the field of view of Swift's telescope and have 5th-magnitude and 7.5-magnitude stars nearby (these stars are actually magnitude 5.5 and 8.2, respectively).

S12–15 and **S12–16** – Corwin suggests that Swift's right ascension is 18 min too small for both of these objects, which establishes that S12–15 is ESO 285-G007 (PGC 64614) and S12–16 is NGC 6902 (PGC 64632).

S12–17 – Both Corwin and Thomson have said that a number of objects in Swift's 12th list have problems. S12–17 and S12–21 must be among the strangest. They were both discovered on September 11, 1897, and their descriptions are absolutely identical. To top it all off, nothing exists at either of Swift's positions, which differ from one another by about 6.5 min in right ascension and one arc minute in declination. The galaxy ESO 340-G020 has been suggested as the object Swift saw,

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[92] L. Swift, "Catalogue No. 1 for 1900.0 of Nebulas," *Astronomical Journal*, **17** (1896 Nov. 13), p. 28.

[93] L. Swift, "Catalogue No. 11 of Nebulae," *Astronomische Nachrichten*, **147** (1898 Sep. 6), pp. 217–218.

[94] H. Howe, "Observations of Nebulae made at the Chamberlin Observatory, University Park, Colorado," *Monthly Notices of the Royal Astronomical Society*, **60** (1899 Dec.), p. 139.

but neither Corwin nor Thomson like the position differences between Swift's objects and the ESO galaxy and both note that it is not situated between two 8½ magnitude stars. Therefore, these are both listed as missing.

S12–18 – Same as S11–197.

S12–19 – Same as S11–199.

S12–21 – See S12–17.

S12–22 – Same as S11–197.

S12–23 – Same as S11–199.

S12–27 – Corwin believes this is NGC 7135, as it matches Swift's description, including the nearby stars.

S12–33 – Same as S12–34 and S12–35.

S12–34 – Same as S12–33 and S12–35.

S12–35 – Same as S12–33 and S12–34.

S12–37 – Steinicke and Lauberts favor ESO 467-G047 (PGC 68694), although other suggestions have been made. Swift's offsets are 1 min east in right ascension and nine arc minutes south in declination. There is a 9th magnitude star south of the galaxy that precedes it in right ascension, which might be the star Swift mentioned. The biggest problem with the identity is that Swift described it as round, while ESO 467-G047 is strongly elongated.

S12–38 – Several people have identified this object as NGC 7294. The detailed description that Swift provided is an excellent match. Swift's position is offset from NGC 7294 by 36 s west in right ascension and less than 2 arc minutes north in declination.

S12–39 – Corwin suggested this was identical to ESO 533-G045 (PGC 69097). Swift's offsets are 50 s west in right ascension and 1° north in declination.

S12–40 – This object is likely NGC 7361, as it fits Swift's description. Swift's position is off by about 2.5 min in right ascension.

S12–41 – It is generally agreed among the modern sleuths that IC 5260 is the same as NGC 7404. The description is accurate.

S12–45 – Same as S11–241.

S13–1, **S13–2**, **S13–3**, **S13–4**, **S13–5**, & **S13–6** – These objects were sent directly to Dreyer and never appeared in any of Swift's catalogs. The descriptions were taken from Dreyer's *New General Catalog* and Dreyer's positions have been converted to equinox 1885.0. S13–3 received two designations by Dreyer. Swift sent the information directly to Dreyer ahead of its publication in Swift's 6th catalog. When Swift's 6th catalog was published he slightly changed the position for this object, which was listed as number 71 (S6–71). Dreyer did not catch the possible link between the two objects, which differed in position by 35 s in right ascension and about 52 arc seconds in declination. S6–71 was designated NGC 5785 and S13–3 was designated NGC 5783.

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