

ASTRONOMISCHE NACHRICHTEN.

N^o 3004.

Catalogue No. 9 of Nebulae discovered at the Warner Observatory.

Those marked with a * are incorporated in Dreyer's N.G. Catalogue, but by an oversight are not in any of my previous lists as published in the Astr. Nachr. It was therefore for the sake of uniformity thought advisable to include them here, as some possessing the latter, may not have access to the former. The places of a few have been redetermined and slightly changed.

No.	Date of discov.	α 1890.0	δ 1890.0	Descriptions and remarks
1	1889 Sept. 18	0 ^h 29 ^m 55 ^s	+ 8° 31.7	v F; p S; l E.
2	" " 28	1 13 35	-17 38.8	v F; p S; l E; 8 mag. * f. 46 ^s 1' north.
3	1889 Oct. 3	1 43 5	+ 9 58.5	ee F; S; c E; bet. 2 distant st. in meridian.
4	1889 Nov. 25	1 43 25	+20 9.6	eee F; p L; R.
5	1889 Oct. 23	1 43 50	- 4 28.2	p F; S; R; bet. 2 st. ? cluster of ee F st.
6	1890 Jan. 18	1 44 0	+27 4.8	e F; S; l E; v F * close f. Found searching for Swift's Comet. Edward.
7	" " 18	1 55 38	+25 56.4	ee F; R. " " " " " Edward.
8	" " 18	1 55 43	+26 29.8	eee F; v S; R; 2 st. point to it. Found searching for Swift's Comet. Edward.
9	1889 Oct. 20	1 56 25	+17 50.2	p B; p L; l E.
10	" " 20	1 57 45	+14 10.2	ee F; S; R; F * nr. s; sp of 2.
11	" " 20	1 58 0	+14 11.6	p F; p S; R; trap. with 3 st.; nf of 2.
12	1889 Dec. 25	3 31 40	- 7 5.2	ee F; p L; R; trap. with 3 st.
13	" " 23	3 36 6	- 5 2.1	ee F; p L; R; passed in line with 1417-18; cometary; unable to re-find it; seeing good. Failed also at Harvard College Observatory.
14	" " 25	3 37 5	- 4 40.0	e F; v S; R; stellar.
15	1889 Oct. 20	4 43 45	+ 0 3.3	e F; v S; R; F * close f.
16	1889 Dec. 27	6 45 4	+13 2.0	ee F; S; e diff.
17	1890 Apr. 20	7 35 5	+49 56.5	e F; p S; R; np of 2.
18	" " 20	7 35 20	+49 54.0	ee F; p S; R; sf of 2; D * nr. sf nearly points to both.
19	1890 May 8	8 46 7	+57 35.0	p F; p S; R; B M; p B * np; ? ee F D * involved.
20	1890 Apr. 19	9 2 50	+38 3.2	eee F; p L; R; ee diff.; 2759 in field sf.
21	1890 Feb. 15	9 25 0	- 3 46.0	ee F; p S; R; 10 m. * s.
22	1890 May 8	10 16 32	+57 35.0	eee F; v S; ee E; spindle ? several ee F st. in a line.
23	1890 Jan. 29	10 28 45	+11 46.0	v F; p S; E; 9 m. * s.
24	1890 May 8	10 44 56	+55 59.0	eee F; p S; l E; B * sf; sp of 2.
25	" " 8	10 45 3	+56 3.3	ee F; p S; R; nf of 2.
26	" " 11	11 18 15	+48 27.0	e F; e S; R; stellar to Nu; F * nr. f; another sus. nr. p.
27	" " 11	11 26 55	+50 51.5	ee F; v S; R.
28	" " 11	11 28 5	+49 41.0	e F; S; R. 1 st of 4.
29	" " 11	11 28 20	+49 40.5	ee F; S; R. 2 nd of 4.
30	" " 11	11 28 55	+49 34.5	eee F; p S; R; F * close sp. 3 rd of 4.
31	" " 11	11 29 0	+49 42.0	e F; S; R; p B * nr. nf. 4 th of 4.
32	" " 11	11 40 10	+50 10.5	v F; v S; R.
33	" " 8	11 44 55	+55 58.0	ee F; p L; i R; 3916-3921 in field.
34	" " 23	12 28 34	+52 52.4	ee F; S; R; * close n.
35	1890 June 8	12 46 30	+54 16.8	v F; v S; l E; stellar.
36	1890 May 11	13 0 45	+54 16.3	v F; S; R; bet. 2 st.
37	1890 June 8	13 4 5	+53 20.8	ee F; p S; R; bet. 2 distant st. Edward.
38	" " 15	13 12 42	+58 7.5	e F; v S; R; stellar.
39	1890 Apr. 19	13 50 15	+ 5 34.4	eee F; p S; i R; seen only by glimpses.

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40*	1887 June 24	14 ^h 34 ^m 50 ^s	+51° 18' 3	eeF; pS; R; bet. 2 st.
41	1889 July 2	14 36 55	+62 30.2	eeF; pS; R; nearly bet. 2 distant wide D st.
42*	1887 June 24	14 52 30	+49 1.8	vF; pS; eE; spindle; pB * close to p end; 4014, 15, 19, 20 in field.
43*	» » 24	14 57 10	+50 26.6	eF; pS; R; bet. 2 distant st.
44*	» » 19	14 59 20	+13 3.8	vF; S; R; D * nf points to it; planetary.
45	1889 June 22	15 4 5	+63 24.8	vF; pS; lE; bet. 2 st.
46	1890 June 8	15 4 10	+56 54.8	eeeF; pS; R; midway bet. 2 vF nr. st. Edward.
47	» » 19	15 5 30	+ 6 11.0	Edward. No description was recorded; seen by us both but after the telescope was moved we disagreed as to description so I left it blank rather than be in error.
48	» » 19	15 12 20	+ 7 38.0	eeF; pS; R. Edward.
49	» » 19	15 16 40	+ 8 50.0	eeF; S; R. Edward.
50	» » 19	15 22 20	+ 7 12.0	eeeF; eS; stellar; vF * close p. Edward.
51	1890 Apr. 19	15 43 5	+ 8 55.3	vF; S; R; 9 m. * close np.
52	1890 Sept. 7	15 47 43	+43 46.6	eeeF; vS; R; 9 m. * sf.
53*	1887 June 19	16 2 24	+14 14.8	eeF; vS; R; D * f points to it; sp of 2.
54*	» » 19	16 2 30	+14 11.5	eeF; vS; R; 2 pB st. nr. s both D; nf of 2.
55	1890 June 28	16 5 20	+10 19.8	eeF; S; E; p. DM. +10°2969, 9 ^s ; ee diff. in consequence of proximity to the star. Found searching for D'Arrest Comet.
56*	1887 June 24	16 8 45	+52 44.7	vF; S; R.
57*	1887 May 31	16 13 0	+63 32.6	vF; pS; lE; D * nr. s points to it.
58	1888 June 7	16 13 2	+62 49.0	vF; vS; lE; r.
59*	1887 June 19	16 14 15	+14 24.8	eF; S; R.
60	1889 June 22	16 14 30	+64 29.8	eeF; pS; R; 3 st. in a line n, most distant D.
61	1890 Apr. 19	16 16 20	- 1 15.8	F; vS; R.
62	1889 July 24	16 37 0	+67 51.2	eeeF; vS; 2 or 3 vF st. inv.; * nr. p.
63*	1887 June 25	16 39 10	+58 1.0	vF; pS; R; sp of 2.
64*	» » 25	16 39 25	+58 2.3	eF; vS; R; nf of 2.
65*	» » 19	16 41 40	- 0 3.6	eeF; pS; iR; 3 F st. s point to it.
66*	» » 15	16 43 5	+ 6 31.0	eeeF; vS; lE; pB * nr. n both in trap.; eee diff.; np of 2.
67*	» » 15	16 43 7	+ 6 25.5	eF; vS; lE; 2 or 3 vF st. inv.; sf of 2.
68	1889 June 22	16 45 10	+58 38.0	eeeF; L; R; evenly B; pB * sp.
69	1890 July 11	16 46 ?	+46 16.7	eeeF; S; iR; B * with distant companion nr. sf. Driving clock failed.
70	1889 July 24	16 47 25	+63 20.2	eF; vS; vE; bet. 2 st.
71	1890 June 23	16 54 0	+55 13.3	eF; pL; lE; * nr. p.
72	1890 May 15	17 5 25	+10 55.7	pF; pS; vE; r.
73	1889 Sept. 15	17 6 40	+36 20.5	pF; pS; R; bet. 2 st.
74*	1887 Apr. 21	17 7 30	+48 29.9	eeF; vS; F * close each side in meridian.
75	1889 Sept. 15	17 8 45	+38 10.0	eF; S; R; BM; F * close s; 3 or 4 others nr. n.
76	» » 15	17 11 0	+35 40.0	eeeF; pS; R; eee diff.; 4 pB st. nr. in line s.
77	1890 June 23	17 12 35	+57 32.8	pF; S; cE.
78*	1887 Apr. 21	17 13 40	+40 59.6	vF; L; iR; sp of 2.
79*	» » 21	17 13 55	+41 11.6	vF; S; lE; nf of 2.
80	1890 May 15	17 25 45	+58 34.3	eeeF; S; R; forms equilateral triangle with two others, 3 rd of 3.
81	1890 June 15	17 28 48	+59 43.5	eeF; pS; cE; B * nearly obscures it; bet. it and aF * nearer the [latter.
82	» » 19	17 29 45	+43 51.0	eF; pS; R; 1 st of 3.
83	» » 19	17 29 50	+43 54.0	eF; pS; R; 2 nd of 3.
84	» » 19	17 30 0	+43 43.5	eeeF; pS; R; 3 rd of 3; eee diff.
85	1890 July 10	17 33 17	+42 10.3	eeF; S; lE.
86*	1887 June 15	17 39 30	+62 42.8	eeF; vS; R; vF D * nr. f.
87*	1887 May 25	18 8 50	+39 39.3	eeeF; pS; E; eee diff.; bet. several B st. Edward.
88*	» » 20	18 30 0	+40 1.4	eeeF; pS; R; eee diff.; nearly in finder field with α Lyrae. Edward.
89*	» » 25	18 30 43	+33 30.0	eF; S; R. Edward.
90*	1887 June 24	18 33 40	+67 1.3	An e close D with 6679; suspected with 132, confirmed with 200; perfectly separated with 250.

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91*	1887 May 29	18 ^h 36 ^m 16 ^s	+39° 56'.4	eeeF; vS; R; e diff.; sp of 2; in finder field with ϵ Lyrae. Edward.
92*	" " 29	18 36 20	+40 5.4	eeeF; eS; R; eee diff.; nf of 2; " " " " " Edward.
93	1890 Apr. 15	19 23 45	+49 4.0	eeeF; vS; R; 2 B and 1 F * in line nr. f, nearest * nf close D with 300.
94*	1887 June 26	20 21 20	+58 1.0	eeeF; pS; F * close p; 2 single and 2 D st. in line n point to it.
95	1889 Sept. 23	20 38 35	+15 11.5	eeeF; pL; R; in center of trap. of 4 st. eee diff.; in finder field with γ and δ Delphini.
96	" " 11	21 3 25	+12 2.0	eeeF; eS; stellar; eF * attached.
97	" " 18	21 57 0	+19 13.2	eeeF; pS; R; bet. 2 nr. F st. in meridian.
98	1889 Oct. 20	22 52 55	+14 25.6	eeeF; vS; R.
99	1887 " 15	23 19 5	+14 2.1	eeeF; pS; iR; 8 m. * f; F * nr. nf; not 4659.
100	1887 Aug. 19	23 54 25	+46 15.8	eF; pS; R; D * points to it.

Warner Observatory, Rochester N. Y., 1890 July.

Lewis Swift.

Observations of (181) Eucharis, and of some small stars near the path of Eucharis, and of a new nebula.

The following observations of (181) Eucharis were made at the request of Dr. de Ball of the Liege Observatory.

The comparison stars 1 and 2 were observed by Mr. Schaeberle with the Meridian Circle. Comparison star 1 can not be above the 10^m (DM. mag. = 9.5). It has a small 12 mag. star 5" or 10" preceding.

Some small stars were incidentally observed during the work, and as the places may prove valuable in the future, I give them below. The star *f* has a 13^m star 3" $\pm$ following and in the same decl.

One new nebula was discovered during these observations and was subsequently seen. I give its place also.

The singular group of exceedingly small and extremely faint nebulae N. G. C. 5940, 5941, 5942 and 5944 discovered by Swift, were run upon and my estimated positions and descriptions agreed essentially with those of Swift. They are quite difficult.

Filar Micrometer Observations of (181) Eucharis
made with the 12 inch Equatorial of the Lick Observatory by *E. E. Barnard*.

1890	Mt. H. M. T.	$\Delta\alpha$	$\Delta\delta$	Cp.	α app.	$\log p.A$	δ app.	$\log p.A$	Red. ad l. app.	*
May 16	10 ^h 35 ^m 36 ^s	+2 ^m 33 ^s 34	— 0' 0".9	12.8	15 ^h 23 ^m 30 ^s 55	9.143 _n	+7° 54' 15".7	0.639	+1 ^s 36 — 4".7	1
17	12 5 19	+1 46.39	+ 1 51.7	22.8	15 22 43.61	8.732	+7 56 6.7	0.635	+1.37 — 4.5	1
18	10 24 17	+1 5.70	+ 3 21.0	24.8	15 22 2.92	9.149 _n	+7 57 36.1	0.638	+1.37 — 4.4	1
19	9 48 21	+0 23.33	+ 4 43.2	22.8	15 21 20 56	9.305 _n	+7 58 58.4	0.643	+1.38 — 4.3	1
20	9 11 59	+2 31.28	— 2 2.6	18.9	15 20 38.29	9.415 _n	+8 0 8.4	0.649	+1.39 — 4.1	2
21	9 43 56	+1 47.41	— 0 58.4	12.8	15 19 54.43	9.477 _n	+8 1 12.7	0.640	+1.40 — 4.0	2
22	9 47 15	+1 4.88	— 0 6.8	18.8	15 19 11.91	9.255 _n	+8 2 4.4	0.637	+1.41 — 3.9	2

Some Small Stars near the path of (181) Eucharis
observed with the 12 inch Equatorial of the Lick Observatory by *E. E. Barnard*.

1890	Nr.	$\Delta\alpha$	$\Delta\delta$	Cp.	α 1890.0	δ 1890.0	Mag.	Red. ad l. app.	*
May 19	<i>a</i>	+0 ^m 20 ^s 00	+ 6' 9".4	2.1	15 ^h 21 ^m 15 ^s 85	+8° 0' 28".9	12 ^m	+1 ^s 38 — 4".3	1
17	<i>b</i>	+1 30.77	+ 1 29.0	16.3	15 22 26.62	+7 55 48.6	12	+1.37 — 4.6	1
15	<i>c</i>	— 0 20.06	— 1 7.4	14.5	15 23 49.90	+7 52 45.5	11.5	+1.35 — 4.8	<i>d</i>
18	<i>d</i>	+3 14.12	— 0 26.7	6.3	15 24 9.96	+7 53 52.9	10	+1.38 — 4.5	1
11	<i>e</i>	— 0 37.6	— 6 6.9	2.1	15 26 36	+7 44	12	+1.34 — 5.5	3
11	<i>f</i>	— 0 25.2	— 6 9.1	2.2	15 26 48	+7 44	12.5	+1.34 — 5.5	3
11	<i>g</i>	— 0 22.6	— 7 15.7	2.1	15 26 51	+7 43	13	+1.34 — 5.5	3
11	<i>h</i>	— 0 22.2	— 4 58.1	3.1	15 26 51	+7 45	12.2	+1.34 — 5.5	3

New Nebula.

1890 May 15 $\Delta\alpha = -0^m 3^s 0$ $\Delta\delta = +4' 5''$ Cp. 2.1 α 1890.0 = 15^h 24^m 4^s 0 δ 1890.0 = +7° 57' 58" * *d*
Mag. 13 Description: v F, R, v g b M, $\frac{3}{4}'$ diam.; 11^m * 1' p.

4"