Deep Sky Observer's Challenge

presented at the
Southern Star Party

The Deep Sky Observer's Challenge

The SSP Deep Sky Observer's Challenge has been designed to challenge your observing skills no matter your level of expertise.

Meeting the challenge is not about quantity, but about quality, so it doesn't matter if you're using small binoculars or a 24-inch computer-controlled telescope.

For the **Beginner's Challenge**, a basic description (with or without a diagram) is adequate. If you know how, you could also indicate the apparent angular size of the object. To meet the Beginner's Challenge, you will need to observe and adequately **describe ten objects**. Feel free to record more!

For the **Intermediate Challenge**, you'll need to include angular size and, where appropriate, direction (either estimating the position angle or by using cardinal directions), in your description. If you know how, you could also include a magnitude estimate. To meet the Intermediate Challenge, you will need to observe and adequately **describe twenty-five objects**. Feel free to record more!

For the **Advanced Challenge**, you'll need to include, in addition to the attributes mentioned above, an estimate of magnitude. To meet the Advanced Challenge, you will need to observe and properly **describe 110 objects** from the list.

Part of the challenge is preparing for the night's observing. Only observations made during the duration of the star party are eligible for consideration, so you'll have to do some planning beforehand.Planning would include selecting suitable objects from the list: will they be visible during the challenge period? I would suggest you select more than the minimum number of objects needed: the more the merrier!

You will also need suitable star charts to help you locate the objects. The choice of charts is up to you. Study the charts before the observing session, locate each object and think about how you're going to star hop to it. You'll also need to think about what equipment you're going to use: the choice is up to you.

Your observations should be recorded in a standard observing log, which will be provided. A page from the log appears at the end of this document. You are welcome to design your own observing log, in which case its up to you to bring along sufficient blank pages to use during the Challenge.

When compiling your description of an object, remember the Silver Rule: your record of an object must allow the reader to create a mental image of the object that is as rich in detail and accurate as possible. It's up to you to decide if you also want to sketch the object (sometimes even a very crude diagram can be very revealing).

The **Challenge officially ends at 03:30 on the last day of the star party**, by which time all observations must be submitted for review. If you complete your Challenge before this, please hand in your observations right away so that the review can be done timeously.

Whichever Challenge you take up, remember the Golden Rule: have fun!

In summary

1. Decide if you want to take up the Basic (10) or Intermediate (25) Challenge. Please e-mail me your decision so that I can prepare the blank observing log sheets.
2. Go through the Challenge List (overleaf) and select objects. Choose more than the minimum, just in case.
3. Find them on the star charts you will use and familiarize yourself with their position within the constellation.
4. Decide on a rough order in which you will observe the objects.
5. Check that you've got a suitable red torch, a pen and/or pencil, and perhaps a clip-board.
6. Review some of the resources listed below.
7. Observing starts on Friday evening, and ends on Sunday at 03:30. Hand in your logs to me as soon as you're done.
8. The outcome of the review will be announced on Sunday during the closing of the SSP.

Resources on the DOCdb website

The Southern Star Wheel: best thing since sliced bread. Allows you to easily locate the southern constellations.

- http://www.docdb.net/tutorials/southern_star_wheel.php

Deep Sky Observing Checklist: a suggestion of things to keep in mind when describing an object (see summary overleaf).

- http://www.docdb.net/tutorials/checklist.php

Star charts: all the objects listed in the Challenge are plotted on the *ConCards* (constellation cards) which you can download and print.

- http://www.docdb.net/tutorials/concards.php

Deep Sky Observer's Companion: A deep sky tutorial and how-to guide.

- http://www.docdb.net/tutorials/deepsky_observers_companion.php

Other resources

Stellarium and *Cartes du Ciel*: free planetarium programmes that could be of help in planning your session.

- http://stellarium.org/
- http://www.ap-i.net/skychart/

A checklist for observing the deep sky

Nebulae

What are your first impressions?
How easy is it to see? (visibility; brightness; magnitude)
What shape is the nebula?
How big is the nebula?
How does the brightness change from edge to centre? (brightness profile)
Is there a nuclear region?
Are the edges sharp or diffuse?
Are there darker parts or areas of uneven brightness?
How well does the nebula stand out from the background field?
What colour is the nebula?
Are there stars very near, or within, the nebula?
How does it relate to the surrounding star field?
Rate your confidence in this observation.

Star clusters

What are your first impressions?
How easy is it to see? (visibility; brightness; magnitude)
What shape is the cluster?
How big is the cluster?
Are individual stars seen? (unresolved .. granular .. partially resolved .. well resolved, etc.)
Are the stars concentrated towards the centre? (not at all .. slightly .. strongly, etc.)
How does the brightness change from edge to centre? (brightness profile)
How many stars can you see? (make an estimate; count the number within a specified diameter)
What is the range of their brightness? (nearly the same .. mixed; estimate magnitudes)
Is there an obvious central or other prominent star?
Do any of the stars have a particular colour?
Are any of the stars double?
Are there chains, rows, or clumps of stars?
Are there prominent empty spaces or starless patches?
Is there a background glow (unresolved stars/nebulosity)?
How does the cluster relate to the surrounding star field?
Rate your confidence in this observation.

Object designation: .... Observer: .... Location: ....

.... Date & time: .... Instrument: ....

Sky conditions: .... Quality of observation: ....

Notes ....

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Note the size of the field of view and its orientation.
out - west - preceding

Star clusters: First impressions, Visibility / magnitude, Shape, Size, Star count, Brightness range, Concentration, Brightness profile, Prominent star, Colour, Double, Chains, Voids, Glow, Context, Confidence.

Nebulae: First impressions, Visibility / magnitude, Shape, Size, Brightness profile, Nucleus, Edges, Uneven brightness, Colour, Stars, Context, Confidence.

Star colours: blue – blue-white – white – yellow-white – light-yellow – deep-yellow – light-orange – deep-orange – orange-red – red.

The Southern Star Party
Deep Sky Observer’s Challenge

CON	OBJECT NAME(S)	RA h	m	s	Dec °	′	″	OBJECT TYPE
And	NGC 7662, Copeland’s Blue Snowball, C 22	23	25	54	+ 42	32	06	planetary nebula
And	NGC 752, Cr 23, Melotte 12, , C 28	01	57	35	+ 37	50		open cluster
And	NGC 224, Andromeda Galaxy, M 31	00	42	44	+ 41	16	09	galaxy
And	NGC 221, Arp 168, LEDA 2555, M 32	00	42	42	+ 40	51	57	galaxy
Ant	NGC 2997, ESO 434-35, LEDA 27978, Ben 41b	09	45	39	– 31	11	25	galaxy
Aps	NGC 6101, Dunlop 68, C 107, Ben 74	16	25	48	– 72	12	06	globular cluster
Aql	Barnard 133, LDN 531	19	06	10	– 06	53	45	dark nebula
Aql	Barnard 142, LDN 688	19	39	41	+ 10	31		dark nebula
Aql	Barnard 143, LDN 694	19	40	42	+ 10	57		dark nebula
Aql	NGC 6781, PN G041.8-02.9	19	18	28	+ 06	32	19	planetary nebula
Aql	NGC 6709, Cr 392	18	51	18	+ 10	19		open cluster
Aql	NGC 6738, Cr 396	19	01	18	+ 11	37		open cluster
Aqr	NGC 7009, Saturn Nebula, Ben 126, C 55	21	04	11	– 11	21	48	planetary nebula
Aqr	NGC 7293, Helix Nebula, Ben 129, C 63, A 100	22	29	39	– 20	50	14	planetary nebula
Aqr	NGC 7089, GCl 121, M 2, Ben 127, A 98	01	33	27	– 00	49	24	globular cluster
Aqr	NGC 6981, GCl 118, M 72, Ben 125	20	53	28	– 12	32	13	globular cluster
Ara	NGC 6397, Lacaille III.11, Ben 98, C 86, A 79	17	40	41	– 53	40	25	globular cluster
Ara	NGC 6193, Dunlop 413, Cr 310, C 82, A 70	16	41	24	– 48	46	09	open cluster
Ara	NGC 6208, Dunlop 364, Cr 313, vdBH 198	16	49	28	– 53	43	42	open cluster
Ara	IC 4651, Cr 327, Melotte 169, vdBH 224	17	24	52	– 49	56	36	open cluster
Aur	NGC 1960, Cr 71, M 36	05	36	12	+ 34	08	24	open cluster
Aur	NGC 2099, Auriga Salt-and-Pepper, M 37	05	52	19	+ 32	33	12	open cluster
Aur	NGC 1912, M 38	05	28	43	+ 35	51	18	open cluster
Boo	NGC 5466, Melotte 124, GCl 27	14	05	27	+ 28	32	04	globular cluster
Cae	NGC 1679, ESO 422-1, LEDA 16120	04	49	56	– 31	58	02	galaxy
Cap	NGC 7099, M 30, Ben 128, A 99	21	40	22	– 23	10	45	globular cluster
Car	NGC 3114, Dunlop 297, A 35	10	02	00	– 60	06	00	open cluster
Car	IC 2581, Cr 222, vdBH 97, A 40	10	27	30	– 57	38	00	open cluster
Car	NGC 3293, Gem Cluster, Lacaille II.8, A 41	10	35	49	– 58	13	00	open cluster
Car	NGC 3324, Cr 225, A 42	10	37	19	– 58	39	36	open cluster
Car	NGC 2808, Dunlop 265, Ben 41, A 32	09	12	03	– 64	51	46	globular cluster
Car	IC 2602, Southern Pleiades, Lac.II.9, C 102, A 43	10	43	12	– 64	24	00	open cluster
Car	NGC 2867, ESO 126-8, C 90	09	21	25	– 58	18	41	planetary nebula
Car	NGC 3532, Pincushion, C 91, A 45	11	05	33	– 58	43	48	open cluster
Car	NGC 3372, eta Carinae Nebula, C 92, A 44	10	44	19	– 59	53	21	bright nebula
Car	NGC 2516, Southern Beehive, C 96, A 28	07	58	06	– 60	45	00	open cluster

CON	OBJECT NAME(S)	RA h	m	s	Dec °	′	″	OBJECT TYPE
Cen	NGC 3918, Blue Planetary, A 47	11	50	18	– 57	10	57	planetary nebula
Cen	NGC 5281, Lacaille I.7, A 59	13	46	30	– 62	54	54	open cluster
Cen	NGC 5460, Dunlop 431, A 60	14	07	24	– 48	20	00	open cluster
Cen	NGC 5662, Lacaille III.8, A 61	14	35	36	– 56	37	00	open cluster
Cen	NGC 4945, Tweezers, Ben 57, C 83, A 54	13	5	26	– 49	28	15	galaxy
Cen	NGC 5128, Centaurus A, Ben 60, C 77, A 55	13	25	28	– 43	01	09	galaxy
Cen	NGC 5139, Omega Centauri, Ben 61, C 80, A 56	13	26	46	– 47	28	37	globular cluster
Cen	NGC 5286, Dunlop 388, Ben 64, C 84	13	46	27	– 51	22	25	globular cluster
Cen	NGC 3766, Lacaille III.7, C 97, A 46	11	36	13	– 61	36	55	open cluster
Cet	NGC 247, Milkweed Seed, Ben 3, C 62, A 3	00	47	09	– 20	45	38	galaxy
Cet	NGC 246, Pac-Man Nebula, C 56, A 4	00	47	03	– 11	52	19	planetary nebula
Cet	NGC 1068, Cetus A, Arp 37, M 77, Ben 9, A 9	02	42	41	– 00	00	48	galaxy
Cha	NGC 3195, C 109	10	09	21	– 80	51	31	planetary nebula
Cir	NGC 5823, Cr 290, Melotte 131, C 88, A 63	15	05	45	– 55	37	30	open cluster
CMa	NGC 2362, Tau CMa, C 64, A 22	07	18	36	– 24	59	00	open cluster
CMa	NGC 2287, Cr 118, M 41, A 21	06	46	00	– 20	46	00	open cluster
CMi	Dolidze 26, C 0727+120	07	30	06	+ 11	54	00	open cluster
Cnc	NGC 2632, Praesepe, Beehive, M 44	08	40	24	+ 19	41	00	open cluster
Cnc	NGC 2682, Cr 204, M 67	08	51	18	+ 11	48	00	open cluster
Col	NGC 1851, Dunlop 508, Ben 32, C 73, A 15	05	14	07	– 40	02	50	globular cluster
Com	NGC 4565, LEDA 42038, C 38	12	36	21	+ 25	59	14	galaxy
Com	NGC 5024, Melotte 117, M 53	13	12	55	+ 18	10	09	globular cluster
Com	NGC 4826, Black Eye Galaxy, M 64	12	56	44	+ 21	41	00	galaxy
Com	NGC 4382, LEDA 40515, M 85	12	25	24	+ 18	11	27	galaxy
Com	NGC 4501, LEDA 41517, M 88	12	31	59	+ 14	25	13	galaxy
Com	NGC 4254, Coma Pinwheel, M 99	12	18	50	+ 14	25	00	galaxy
Com	Coma Berenices Cluster, Melotte 111	12	22	30	+ 25	51	00	open cluster
CrA	Bernes 157, Magakian 782, V709 CrA, A 93	19	01	35	– 37	00	55	bright nebula
CrA	NGC 6541, Ben 104, C 78, A 85	18	08	02	– 43	42	20	globular cluster
CrA	NGC 6726-7-9, R CrA Nebula, C 68	19	01	38	– 36	53	31	bright nebula
CrA	SL 42, Sandqvist 42, DCld 000.4-19.5	19	10	16	– 37	07	30	dark nebula
Cru	NGC 4755, Jewel Box, C 94, A 52	12	53	42	– 60	22	00	open cluster
Cru	NGC 4609, Coalsack Cluster, C 98	12	42	18	– 62	59	00	open cluster
Cru	Coal Sack, C 99, A 51	12	31	19	– 63	44	36	dark nebula
Cru	NGC 4103, Dunlop 291, Mel 109, Cr 252	12	06	43	– 61	15	21	open cluster
Cru	NGC 4349, Dunlop 292, Cr 255, vdBH 130	12	24	12	– 61	52	00	open cluster
Cru	NGC 4052, Cr 251, vdBH 126	12	01	12	– 63	13	00	open cluster
Crv	NGC 4361, ESO 573-19, A 48	12	24	31	– 18	47	06	planetary nebula
Crv	Stargate Asterism	12	35	46	– 12	01	36	asterism
CVn	NGC 5272, GCl 25, M 3	13	42	11	+ 28	22	32	globular cluster
CVn	NGC 4736, LEDA 43495, M 94	12	50	53	+ 41	07	09	galaxy

CON	OBJECT NAME(S)	RA h	RA m	RA s	Dec °	Dec ′	Dec ″	OBJECT TYPE
Cyg	NGC 6913, M 29	20	23	56	+ 38	31	24	open cluster
Cyg	Barnard 144, Fish on a Platter Nebula	19	58	00	+ 35	20	00	dark nebula
Del	NGC 6934, Melotte 230, GCl 117, C 47	20	34	11	+ 07	24	15	globular cluster
Del	Harrington 9	20	38		+ 13	30		asterism
Dor	Large Magellanic Cloud, ESO 56-115, A 16	05	23	35	– 69	45	22	galaxy
Eri	NGC 1232, Arp 41, ESO 547-14, Ben 10a	03	09	45	– 20	34	45	galaxy
Eri	NGC 1291, NGC 1269, Dun.487, Ben 12, A 11	03	17	19	– 41	06	29	galaxy
Eri	NGC 1535, Ben 22, A 14	04	14	16	– 12	44	22	planetary nebula
Eri	NGC 1332, ESO 548-18, LEDA 12838	03	26	17	– 21	20	04	galaxy
For	NGC 1097, Arp 77, ESO 416-20, Ben 10, C 67	02	46	19	– 30	16	29	galaxy
For	NGC 1316, Fornax A, Arp 154, Ben 14, A 12	03	22	42	– 37	12	34	galaxy
For	NGC 1360, ESO 482-7, Ben 15	03	33	15	– 25	52	18	planetary nebula
For	NGC 1365, ESO 358-17, Ben 16, A 13	03	33	36	– 36	08	28	galaxy
Gem	NGC 2392, Clown Nebula, Eskimo Nebula, C 39	07	29	11	+ 20	54	42	planetary nebula
Gem	NGC 2168, Cr 82, M 35	06	09	06	+ 24	21	00	open cluster
Gem	NGC 2158, Cr 81, Melotte 40	06	07	25	+ 24	05	48	open cluster
Gem	NGC 2395, Cr 144	07	27	06	+ 13	35	00	open cluster
Gem	NGC 2129, Cr 77	06	01	06	+ 23	19	24	open cluster
Her	NGC 6205, Hercules Cluster, M 13	16	41	41	+ 36	27	37	globular cluster
Her	NGC 6341, GCl 59, M 92	17	17	08	+ 43	08	12	globular cluster
Her	NGC 6210, HD 151121	16	44	29	+ 23	48	00	planetary nebula
Hor	NGC 1261, Dun 337, Ben 11, C 87, A 10	03	12	16	– 55	13	00	globular cluster
Hya	NGC 3242, Ghost of Jupiter, Ben 45, C 59, A 39	10	24	46	– 18	38	33	planetary nebula
Hya	NGC 2548, Cr 179, M 48, A 30	08	13	42	– 05	45		open cluster
Hya	NGC 4590, Melotte 113, M 68, Ben 51	12	39	28	– 26	44	35	globular cluster
Hya	NGC 5236, M 83, Ben 63, A 58	13	37	01	– 29	51	59	galaxy
Hyi	NGC 1511, ESO 55-4, LEDA 14236	03	59	36	– 67	38	06	galaxy
Ind	NGC 7090, AM 2133-544, ESO 188-12	21	36	29	– 54	33	24	galaxy
Lac	NGC 7243, Cr 448, C 16	22	15	06	+ 49	54	00	open cluster
Lac	NGC 7209, Cr 444	22	05	18	+ 46	29	00	open cluster
Leo	NGC 3379, LEDA 32256, M 105	10	47	50	+ 12	34	55	galaxy
Leo	NGC 3623, Arp 317B, LEDA 34612, M 65	11	18	56	+ 13	05	32	galaxy
Leo	NGC 3627, Arp 317A, Arp 16, LEDA 34695, M 66	11	20	15	+ 12	59	22	galaxy
Leo	NGC 3351, LEDA 32007, M 95	10	43	58	+ 11	42	13	galaxy
Leo	NGC 3368, LEDA 32192, M 96	10	46	46	+ 11	49	10	galaxy
Leo	NGC 3521, LEDA 33550	11	05	49	– 00	02	06	galaxy
Leo	NGC 2903, NGC 2905, LEDA 27077	09	32	10	+ 21	30	03	galaxy
Lep	NGC 1904, GCl 10, M 79, Ben 34, A 17	05	24	11	– 24	31	27	globular cluster
Lep	NGC 2017, ESO 554-22	05	39	17	– 17	50	48	open cluster

			RA			Dec		
CON	**OBJECT NAME(S)**	**h**	**m**	**s**	**°**	**′**	**″**	**OBJECT TYPE**
Lib	NGC 5897, Ghost Globular, Ben 68	15	17	24	– 21	00	36	globular cluster
LMC	NGC 1763, LHA 120-N 11B, LH 10, Ben 27	04	56	52	– 66	24	25	bright nebula
LMC	NGC 2070, Tarantula, Ben 35, C 103, A 20	05	38	42	– 69	06	00	bright nebula
LMC	NGC 1714	04	52	08	– 66	55	23	bright nebula
LMC	NGC 1854	05	09	20	– 68	50	53	globular cluster
LMC	NGC 1818	05	04	14	– 66	26	02	open cluster
LMC	NGC 1903	05	17	22	– 69	20	16	open cluster
LMC	NGC 1916	05	18	38	– 69	24	23	open cluster
LMC	NGC 2004	05	30	40	– 67	17	14	open cluster
LMC	NGC 1910, Dunlop 129, ESO 56-99	05	18	43	– 69	14	12	cluster+nebula
LMC	NGC 1850	05	08	46	– 68	45	39	cluster+nebula
LMC	NGC 1858	05	09	56	– 68	54	06	cluster+nebula
LMC	NGC 1983	05	27	48	– 68	59	12	cluster+nebula
LMC	NGC 1984	05	27	41	– 69	08	05	cluster+nebula
LMC	NGC 2029	05	35	29	– 67	34	06	cluster+nebula
LMC	NGC 2032	05	35	24	– 67	35	01	cluster+nebula
LMC	NGC 2035	05	35	32	– 67	35	06	cluster+nebula
LMC	NGC 2074	05	39	3	– 69	29	54	cluster+nebula
LMC	NGC 2100	05	42	09	– 69	12	44	cluster+nebula
LMi	Harrington 6, Sailboat Cluster	10	10		+ 31	30		asterism
Lup	NGC 5822, Cr 289, Melotte 130, vdBH 168, A 62	15	04	24	– 54	24		open cluster
Lup	Barnard 228, Be 148, DCld 338.8+16.5C, A 64	15	44	00	– 34	30		dark nebula
Lup	NGC 5927, Dunlop 389, vdBH 173, Ben 69	15	28	01	– 50	40	22	globular cluster
Lup	NGC 5986, Dunlop 552, Mel 136, GCl 37, Ben 70	15	46	03	– 37	47	10	globular cluster
Lup	NGC 5882, IC 1108, ESO 274-7	15	16	50	– 45	38	58	planetary nebula
Lyr	NGC 6779, Melotte 220, GCl 110, M 56	19	16	36	+ 30	11	04	globular cluster
Lyr	NGC 6720, Ring Nebula, M 57	18	53	35	+ 33	01	45	planetary nebula
Lyr	Stephenson 1	18	53	30	+ 36	55		open cluster
Lyx	NGC 2419, Intergalactic Wanderer, GCl 12, C 25	07	38	09	+ 38	52	55	globular cluster
Lyx	NGC 2683, LEDA 24930	08	52	42	+ 33	25	10	galaxy
Men	IC 2051, AM 0358-835, ESO 4-7, LEDA 13999	03	52	02	– 83	49	56	galaxy
Mon	NGC 2261, Hubble’s Variable Neb, R Mon, C 46	06	39	10	+ 08	44	11	reflection nebula
Mon	NGC 2237, Rosette Nebula, Sh 2-275, C 49	06	30	55	+ 05	02	57	bright nebula
Mon	NGC 2239, NGC 2244, Cr 99, Melotte 47, C 50	06	31	56	+ 04	56	35	open cluster
Mon	NGC 2323, Cr 124, M 50	07	02	48	– 08	22	36	open cluster
Mon	NGC 2301, Great Bird Cluster, Cr 119	06	51	48	+ 00	28	00	open cluster
Mon	NGC 2264, Christmas Tree Cluster, Cr 112	06	41	00	+ 09	53	00	open cluster
Mus	Dark Doodad, DCld 301.0-08.6, A 49	12	27	31	– 71	25	12	dark nebula
Mus	NGC 5189, IC 4274, Ben 62, A 57	13	33	33	– 65	58	27	planetary nebula
Mus	NGC 4833, C 105, Ben 56, A 53	12	59	35	– 70	52	29	globular cluster
Mus	NGC 4372, Melotte 112, GCl 19, C 108, Ben 50	12	25	45	– 72	39	33	globular cluster
Mus	NGC 4463, Cr 260, vdBH 135	12	30	00	– 64	47	00	open cluster

CON	OBJECT NAME(S)	RA h	RA m	RA s	Dec °	Dec ′	Dec ″	OBJECT TYPE
Nor	NGC 6087, S Normae Cluster, Dun 326, A 67	16	18	48	– 57	56	00	open cluster
Nor	NGC 6067, Dunlop 360, C 89, A 66	16	13	12	– 54	13	00	open cluster
Nor	Harvard 10, Cr 299	16	18	48	– 54	56	00	open cluster
Nor	NGC 6152, Cr 304	16	32	42	– 52	38	00	open cluster
Oct	Melotte 227, Cr 411, A 97	20	12	06	– 79	19		open cluster
Oph	Barnard 78, Bowl of the Pipe Nebula, A 77	17	32	00	– 25	35		dark nebula
Oph	Barnard 67, A 77	17	22	30	– 21	53		dark nebula
Oph	Barnard 66, LDN 1768, A 77	17	20	06	– 26	52		dark nebula
Oph	Barnard 65, LDN 1772, A 77	17	19	48	– 26	38		dark nebula
Oph	Barnard 59, Sink Hole, LDN 1746, A 77	17	11	06	– 27	24		dark nebula
Oph	NGC 6254, GCl 49, M 10, Ben 83, A 73	16	57	09	– 04	05	58	globular cluster
Oph	NGC 6171, GCl 44, M 107, Ben 79	16	32	32	– 13	03	13	globular cluster
Oph	NGC 6218, Melotte 151, M 12, Ben 80, A 71	16	47	15	– 01	56	52	globular cluster
Oph	NGC 6402, GCl 72, M 14, Ben 97	17	37	36	– 03	14	45	globular cluster
Oph	NGC 6273, GCl 52, M 19, Ben 86, A 75	17	02	38	– 26	16	5	globular cluster
Oph	NGC 6266, Dunlop 627, M 62, Ben 85, A 74	17	01	13	– 30	06	45	globular cluster
Oph	Barnard 72, Snake, LDN 66	17	23	35	– 23	37		dark nebula
Oph	NGC 6633, Cr 380	18	27	31	+ 06	34	12	open cluster
Oph	NGC 6572, PN G034.6+11.8	18	12	06	+ 06	51	13	planetary nebula
Oph	IC 4665, Melotte 179, Cr 349	17	46	18	+ 05	43		open cluster
Ori	NGC 1977, A 19	05	35	15	– 04	53	12	open cluster
Ori	NGC 1976, Great Orion Nebula, M 42, A 18	05	35	17	– 05	23	28	bright nebula
Ori	NGC 1982, Mairan’s Nebula, M 43	05	35	31	– 05	16	12	bright nebula
Ori	NGC 2068, VDB 59, Bernes 102, M 78	05	46	45	+ 00	03	43	reflection nebula
Ori	B33, Horse Head	05	40	59	– 2	27	30	dark nebula
Ori	NGC 2169, “37” Cluster, Cr 83	06	08	33	+ 13	57	57	open cluster
Ori	NGC 2024, Flame	05	41	43	– 1	50	30	bright+dark neb.
Pav	NGC 6744, Dunlop 262, C 101, Ben 120, A 94	19	09	45	– 63	51	21	galaxy
Pav	NGC 6752, The Starfish, C 93, Ben 121, A 95	19	10	52	– 59	58	55	globular cluster
Peg	NGC 7331, NGC 7327, LEDA 69291, C 30	22	36	34	+ 34	30	07	galaxy
Peg	NGC 7078, GCl 120, M 15	21	29	58	+ 12	10	01	globular cluster
Per	NGC 1039, Cr 31, M 34	02	42	05	+ 42	45	00	open cluster
Per	NGC 1023, Arp 135	02	40	24	+ 39	03	46	galaxy
Psc	NGC 628, LEDA 5974, M 74	01	36	42	+ 15	47	00	galaxy
Pup	NGC 2451, Cr 161, vdBH 9, A 25	07	45	24	– 37	58	00	open cluster
Pup	NGC 2298, Dunlop 578, Ben 37	06	48	59	– 36	00	19	globular cluster
Pup	NGC 2477, Lacaille I.3, C 71, A 27	07	52	06	– 38	32	00	open cluster
Pup	NGC 2437, Cr 159, M 46, A 24	07	41	42	– 14	49	00	open cluster
Pup	NGC 2422, NGC 2478, Cr 152, M 47, A 23	07	36	35	– 14	28	57	open cluster
Pup	NGC 2447, Melotte 76, Cr 160, M 93, A 26	07	44	30	– 23	51	12	open cluster
Pup	NGC 2539, Cr 176, Melotte 83	08	10	42	– 12	50	00	open cluster
Pup	NGC 2438, PN G231.8+04.1 (in NGC 2437)	07	41	51	– 14	43	55	planetary nebula
Pup	NGC 2546, Lacaille II.4, Dunlop 563	08	11	54	– 37	37	00	open cluster
Pyx	NGC 2818, Dunlop 564, Cr 206, Mel 96, A 33	09	16	10	– 36	37	06	open cluster
Pyx	NGC 2818A, Hen 2-23, PN G261.9+08.5, A 33	09	16	02	– 36	37	39	planetary nebula

CON	OBJECT NAME(S)	RA h	m	s	Dec °	′	″	OBJECT TYPE
Ret	NGC 1574, ESO 157-22, SGC 042059-5705.4	04	21	59	– 56	58	29	galaxy
Scl	NGC 55, String of Pearls, Ben 1, C 72, A 1	00	14	54	– 39	11	55	galaxy
Scl	NGC 253, Silver Coin, Ben 4, C 65, A 5	00	47	33	– 25	17	18	galaxy
Scl	NGC 288, Melotte 3, GCl 2, Ben 5, A 6	00	52	45	– 26	34	51	globular cluster
Sco	NGC 6281, Dunlop 556, Cr 324, vdBH 213, A 76	17	04	42	– 37	59	00	open cluster
Sco	NGC 6302, Bug Nebula, Bipolar Nebula, C 69	17	13	44	– 37	06	16	planetary nebula
Sco	NGC 6124, Lacaille I.8, Dunlop 514, C 75, A 69	16	25	18	– 40	39	00	open cluster
Sco	NGC 6231, False Comet, Lac II.13, C 76, A 72	16	54	09	– 41	49	36	open cluster
Sco	NGC 6121, Lacaille I.9, M 4, Ben 75, A 68	16	23	35	– 26	31	32	globular cluster
Sco	NGC 6405, Butterfly Cluster, Lac III.12, M 6, A 78	17	40	18	– 32	12	00	open cluster
Sco	NGC 6475, Ptolemy’s Cluster, Lac II.14, M 7, A 80	17	53	48	– 34	47	00	open cluster
Sco	NGC 6093, Melotte 142, M 80, Ben 73	16	17	03	– 22	58	30	globular cluster
Sco	NGC 6153, ESO 331-6, RCW 112	16	31	31	– 40	15	14	planetary nebula
Sct	NGC 6705, Wild Duck, M 11, Ben 116, A 91	18	51	00	– 06	16	00	open cluster
Sct	NGC 6694, Cr 389, Melotte 212, M 26	18	45	18	– 09	23	00	open cluster
Sct	Barnard 318	18	49	42	– 06	23	00	dark nebula
Sct	Barnard 111, LDN 534	18	50	00	– 04	57	00	dark nebula
Sct	Barnard 119A	18	54	39	– 05	10	00	dark nebula
Ser	NGC 6611, IC 4703, Eagle Nebula, M 16	18	18	48	– 13	48	26	bright nebula
Ser	NGC 5904, Melotte 133, GCl 34, M 5	15	18	34	+ 02	04	58	globular cluster
Ser	NGC 6539, GCl 85	18	04	50	– 07	35	09	globular cluster
Ser	IC 4756, Cr 386, Melotte 210, Graff 1	18	38	31	+ 05	29	24	open cluster
Sex	NGC 3115, Spindle Galaxy, Ben 42, C 53, A 36	10	05	14	– 07	43	08	galaxy
Sge	NGC 6838, Cr 409, Mel 226, M 71	19	53	46	+ 18	46	42	globular cluster
Sgr	NGC 6723, Dunlop 573, Ben 119, A 92	18	59	33	– 36	37	53	globular cluster
Sgr	NGC 6818, Little Gem Nebula, Ben 123	19	43	58	– 14	09	12	planetary nebula
Sgr	NGC 6618, Swan/Omega, M 17, Ben 108, A 87	18	20	47	– 16	10	18	bright nebula
Sgr	NGC 6514, Trifid Nebula, LBN 27, M 20, A 82	18	02	23	– 23	01	48	bright nebula
Sgr	NGC 6531, Cr 363, M 21, A 84	18	04	12	– 22	29	00	open cluster
Sgr	NGC 6656, Lacaille I.12, M 22, Ben 114, A 90	18	36	24	– 23	54	12	globular cluster
Sgr	NGC 6494, Cr 356, M 23, A 81	17	56	56	– 19	00	42	open cluster
Sgr	IC 4715, Delle Caustiche, M 24, A 88	18	18	48	– 18	33	00	stellar association
Sgr	IC 4725, Cr 382, Melotte 204, M 25, A 89	18	31	42	– 19	07	00	open cluster
Sgr	NGC 6626, GCl 94, M 28, Ben 110	18	24	33	– 24	52	11	globular cluster
Sgr	NGC 6715, Dunlop 624, GCl 104, M 54, Ben 118	18	55	03	– 30	28	43	globular cluster
Sgr	NGC 6809, Lacaille I.14, M 55, Ben 122, A 96	19	39	59	– 30	57	44	globular cluster
Sgr	NGC 6637, Lacaille I.11, M 69, Ben 112	18	31	23	– 32	20	53	globular cluster
Sgr	NGC 6681, Dunlop 614, M 70, Ben 115	18	43	13	– 32	17	31	globular cluster
Sgr	NGC 6523, Lagoon, Lac III.13, M 8, A 83	18	03	12	– 24	23	00	bright nebula
Sgr	Barnard 86, Herschel’s Hole in the Heavens	18	02	58	– 27	52	06	dark nebula
Sgr	Barnard 92, LDN 323	18	15	30	– 18	11	00	dark nebula
SMC	NGC 346, Dunlop 25, LHA 115-N 66A	00	59	04	– 72	10	42	open cluster
SMC	NGC 371, Cl Lindsay 71, ESO 51-14	01	03	30	– 72	03	18	open cluster
SMC	NGC 456, Cl Lindsay 94, ESO 29-38	01	13	42	– 73	17	30	open cluster

CON	OBJECT NAME(S)	RA h	RA m	RA s	Dec °	Dec ′	Dec ″	OBJECT TYPE
Tau	Hyades, Melotte 25, Cr 50, C 41	04	26	54	+ 15	52	00	open cluster
Tau	NGC 1952, Crab Nebula, SN 1054, M 1	05	34	32	+ 22	00	52	SNR
Tau	Pleiades, Seven Sisters, Mel 22, Cr 42, M 45	03	47	29	+ 24	06	18	open cluster
Tau	NGC 1746, Cr 57	05	03	50	+ 23	46	12	open cluster
Tau	NGC 1647, Cr 54	04	45	54	+ 19	07	00	open cluster
Tau	NGC 1807, Cr 59	05	10	47	+ 16	31	00	open cluster
Tau	NGC 1514, PK 165-15 1	04	09	17	+ 30	46	33	planetary nebula
Tel	NGC 6584, Dunlop 376, Ben 107, A 86	18	18	38	– 52	12	55	globular cluster
Tel	Harrington 8	18	30	30	– 46	08		asterism
TrA	NGC 6025, Lac III-10, Dunlop 304, C 95, A 65	16	03	18	– 60	26		open cluster
Tri	NGC 598, Triangulum Galaxy, M 33	01	33	51	+ 30	39	37	galaxy
Tri	Cr 21	01	50	12	+ 27	04	48	asterism
Tri	NGC 604, VGHC 2-106	01	34	33	+ 30	47	06	bright nebula
Tuc	NGC 292, Small Magellanic Cloud, A 7	00	52	38	– 72	48	01	galaxy
Tuc	NGC 104, 47 Tucanae, Lac I.1, Ben 2, C 106, A 2	00	24	06	– 72	04	53	globular cluster
Tuc	NGC 362, Dun 62, Mel 4, Ben 7, C 104, A 8	01	03	14	– 70	50	54	globular cluster
UMa	NGC 5457, Pinwheel, M 101, Arp 26, M 101	14	03	13	+ 54	20	53	galaxy
UMa	NGC 3556, M 108, M 108	11	11	31	+ 55	40	31	galaxy
Vel	NGC 2547, Lacaille III.2, Dunlop 410, A 29	08	10	26	– 49	10	03	open cluster
Vel	IC 2488, Lacaille III.4, Cr 208, A 34	09	27	36	– 57	00	00	open cluster
Vel	NGC 3132, Eight-Burst, Ben 43, C 74, A 37	10	07	02	– 40	26	11	planetary nebula
Vel	NGC 3201, Dunlop 445, Ben 44, C 79, A 38	10	17	37	– 46	24	40	globular cluster
Vel	IC 2391, omicron Velorum Cluster, C 85, A 31	08	40	36	– 53	02	00	open cluster
Vel	NGC 2626, Ced 106h, Mu18	08	35	32	– 40	40	18	bright nebula
Vel	IC 2395, Lacaille III.3, Cr 192, vdBH 47	08	42	37	– 48	06	48	open cluster
Vel	NGC 3228, Lacaille II.7, Dunlop 386, vdBH 93	10	21	24	– 51	44	00	open cluster
Vir	NGC 4594, Sombrero, M 104, Ben 52, A 50	12	39	59	– 11	37	23	galaxy
Vir	NGC 4472, LEDA 41220, M 49	12	29	47	+ 8	00	00	galaxy
Vir	NGC 4579, LEDA 42168, M 58	12	37	43	+ 11	49	04	galaxy
Vir	NGC 4303, LEDA 40001, M 61	12	21	55	+ 4	28	29	galaxy
Vir	NGC 4374, Markarian Chain, M 84	12	25	04	+ 12	53	13	galaxy
Vir	NGC 4406, Markarian Chain, M 86	12	26	12	+ 12	56	45	galaxy
Vir	NGC 4486, Virgo Galaxy, Virgo A, M 87	12	30	49	+ 12	23	28	galaxy
Vir	Jaws Asterism, Sombrero's Arrow	12	38		– 11	32		asterism
Vol	NGC 2442, NGC 2443, ESO 59-8	07	36	24	– 69	31	47	galaxy
Vul	NGC 6885, 20 Vulpeculae Cluster, C 37	20	12	00	+ 26	29	00	open cluster
Vul	NGC 6853, Dumb-Bell Nebula, M 27	19	59	36	+ 22	43	16	planetary nebula
Vul	Cr 399, Coathanger, Brocchi's Cluster	19	26	12	+ 20	05	33	open cluster
Vul	NGC 6940, Melotte 232, Cr 424	20	34	24	+ 28	17	00	open cluster
-	Milky Way	-	-	-	-	-	-	galaxy

Some abbreviations used in the "Object Names" column:
A = ASSA Top 100; B = Barnard; Ben = Jack Bennett; C = Caldwell; Cr = Collinder; Dun = Dunlop; Lac = Lacaille; and M = Messier