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Sky atlas and calendar of events for 2023

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Presentation

This simple sky atlas is focused on amateur astronomers that don't need a basic atlas neither a too much detailed one. It is designed to be printed in long side duplex mode and A4 size, and handled in landscape orientation. The first part shows the sky for each month (for a latitude of 40.0° N), including a detailed list of the astronomical events for each month, most of them only visible with a telescope. The most relevant events like eclipses or lunar phases appear in boldface. Charts show the night sky observing towards South for 0h UT (Universal Time), so during the summer they show the main constellations visible, and during the winter those for the late night or those visible after the sunset on the right side (West) of the meridian. The chart for the next month is equivalente to the current month but two hours later, without considering the movement of Solar System bodies. Equally, the chart for the previous month is equivalente to the one for the current month but two hours before. Limiting magnitudes are 6.5 for stars and deep sky objects, and coordinates are geocentric. The second section shows the sky atlas itself, with 26 charts covering an area of about 30x20 degrees and a distribution similar to the Sky Atlas 2000 by Wil Tirion. Includes stars up to magnitude 8.25 and deep sky objects brighter than magnitude 11 (some fainter ones will appear if they are in Messier or Caldwell catalogs). For each chart there is a table showing the deep sky objects visible on it, sorted by magnitude. Additional tables show the main double stars (from https://www.stelledoppie.it, with primary/secondary components brighter than magnitude 7/8.5 and with a minimum separation of 10"), and the main variable stars on that chart. Variability types are P (pulsating), Er (eruptive), Ecl (eclipsing), and R (rotating), and the tables also show the date of the maximum for long-period variables (according to the bulletins by AAVSO). The minima of the eclipsing variable stars β Persei, β Lyrae, and λ Tau (brighter than magnitude 4) are shown in the list of events, calculated with the catalog available at http://www.as.up.krakow.pl/ephem/. Coordinates for the atlas are astrometric, referred to the Julian epoch of the first day of the year of the atlas. The trajectories of external planets are show during one month around the date of the opposition.

All charts have a leyend on it or at the previous page. The information in the leyend is quite simple. The line representing double stars also shows the expected direction of the secondary component. Diffuse and dark nebula are represented with darker and lighter levels of blue. The constellation lines are shown to simplify the visual navigation around their figures. Lastly, the positions of the radiants of meteor showers are also shown, with the expected date for the maximum of the shower.

The total number of stars in the atlas is around 60 000, with 1100 deep sky objects (1010 in the tables), 435 double stars and 115 variable stars. Some events or objects may not appear in the tables when there are too much entries on them. The total number of astronomical events is around 1580.

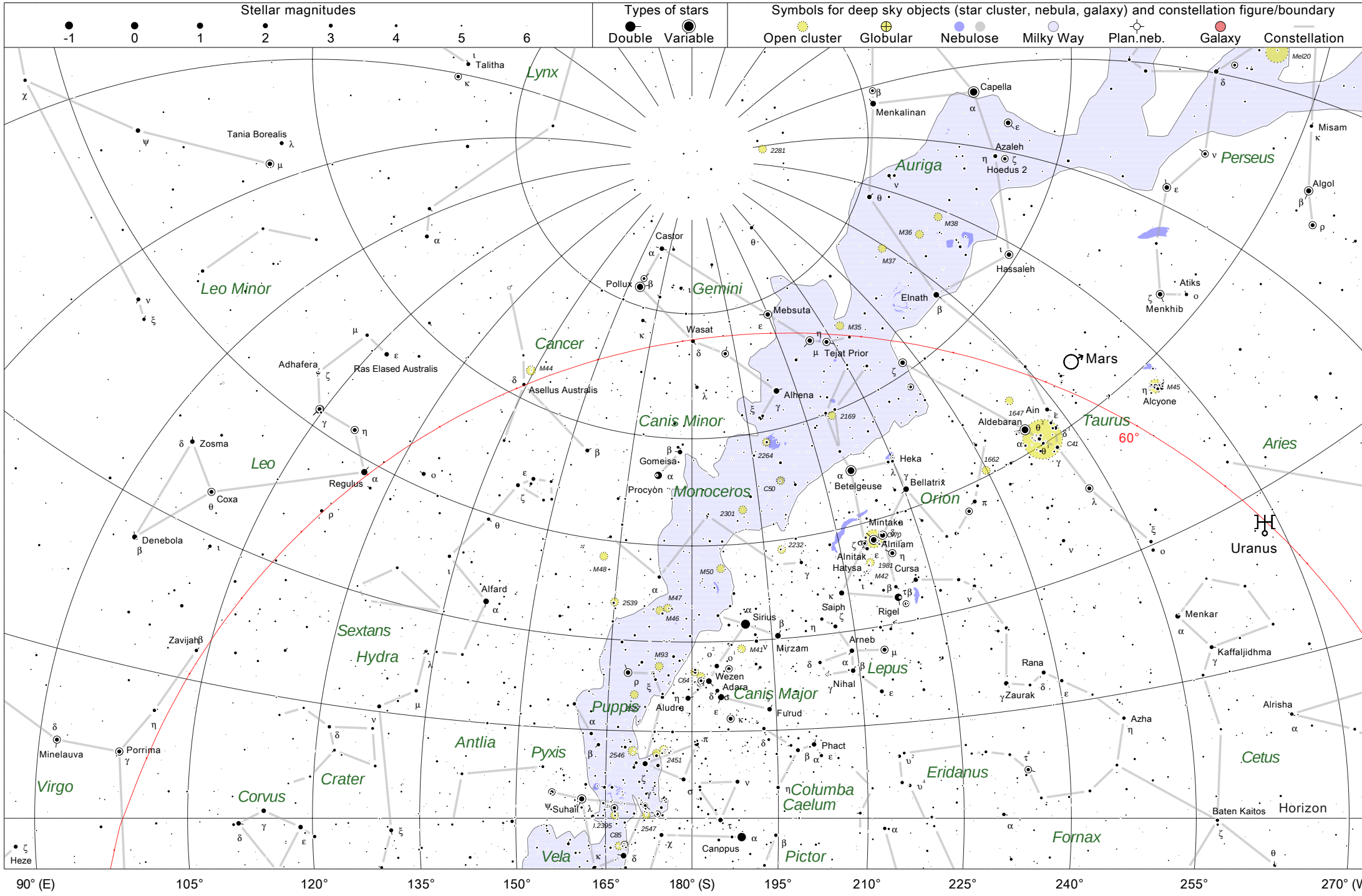
The electronic version of this atlas is free, and has been developed by Tomás Alonso, astronomer at Observatorio Astronómico Nacional, using his own JPARSEC astronomical package (http://conga.oan.es/%7Ealonso/doku.php?id=jparsec). The library is distributed as free software under GPL license. This document is distributed under the terms of the Creative Commons license. There are other free alternatives with less detail, like the beginners atlas by Ed Vazhorov (http://www.eproject.ru/edownload/19062005/page1.htm), and more detailed ones, like the Bungee Sky Atlas by Angelo Nicolini (https://bitbucket.org/anjiloh/bungeeskyatlas/downloads/), also based on JPARSEC.

Monthly night sky

Astronomical events for January

Date (UT)	Event description
1, 22:44	Conjunction Moon-Uranus
2, 03:42	Minimum of eclipsing binary β Per
2, 22:02 → 3, 00:20	Transit of Io on top of Jupiter
2, 22:32 → 3, 01:19	Eclipse of Ganymede by Jupiter
2, 23:22 → 3, 01:39	Shadow transit of Io on top of Jupiter
3, 19:39	Conjunction Moon-Mars
4, 03:03	**Maximum of Quadrantids**
4, 16:16	Minimum distance of Sun (0.983 AU)
4, 18:18	Minimum of eclipsing binary λ Tau
4, 18:43 → 20:01	Transit of Mimas on top of Saturn
4, 18:47 → 20:23	Shadow transit of Mimas on top of Saturn
4, 20:04 → 21:13	Shadow transit of Enceladus on top of Saturn
5, 00:31	Minimum of eclipsing binary β Per
5, 04:55	Conjunction (2) Pallas-κ CMa
6, 03:08	Moon's maximum declination (27.406°)
6, 04:56 → 06:16	Occultation of Mimas by Saturn
6, 04:58 → 06:07	Shadow transit of Enceladus on top of Saturn
6, 05:00 → 06:36	Eclipse of Mimas by Saturn
6, 11:01 → 13:19	Transit of Io on top of Jupiter
6, 12:20 → 14:37	Shadow transit of Io on top of Jupiter
6, 12:44 → 15:29	Shadow transit of Ganymede on top of Jupiter
6, 19:55	Minimum of eclipsing binary β Lyr
6, 23:08	Full Moon
7, 10:17	Minimum elongation of Mercury (2.780°)
7, 13:33	Conjunction Moon-β Gem
7, 13:45	Conjunction Moon-κ Gem
7, 13:51 → 15:01	Shadow transit of Enceladus on top of Saturn
7, 14:34 → 15:55	Transit of Mimas on top of Saturn
7, 14:38 → 16:15	Shadow transit of Mimas on top of Saturn
7, 21:20	Minimum of eclipsing binary β Per
8, 04:27 → 05:30	Occultation of Callisto by Jupiter
8, 05:30 → 07:48	Transit of Io on top of Jupiter
8, 06:50 → 09:06	Shadow transit of Io on top of Jupiter
8, 09:19	Moon's apogee (parallax = 53' 56.843")
8, 17:10	Minimum of eclipsing binary λ Tau
9, 21:11 → 10, 00:18	Occultation of Ganymede by Jupiter
10, 24:00 → 02:18	Transit of Io on top of Jupiter
10, 01:18 → 03:35	Shadow transit of Io on top of Jupiter
10, 02:35 → 05:20	Eclipse of Ganymede by Jupiter
10, 12:06	Conjunction Moon-η Leo
10, 14:42	Conjunction Moon-α Leo
10, 18:09	Minimum of eclipsing binary β Per
11, 09:41 → 10:22	NGC3368 (M96) behind Moon
12, 07:40 → 09:05	Transit of Mimas on top of Saturn
12, 07:44 → 09:22	Shadow transit of Mimas on top of Saturn
12, 08:51 → 10:04	Eclipse of Enceladus by Saturn
12, 08:59 → 09:24	Occultation of Enceladus by Saturn
12, 16:03	Minimum of eclipsing binary λ Tau
12, 18:49	Minimum distance from Sun of C/2022 E3 ZTF MPEC 2023-E68 (1.112 AU)
13, 11:27 → 14:34	Transit of Ganymede on top of Jupiter
13, 12:59 → 15:17	Transit of Io on top of Jupiter
13, 13:32	Conjunction Moon-η Vir
13, 14:16 → 16:33	Shadow transit of Io on top of Jupiter
13, 14:58	Minimum of eclipsing binary β Per
13, 17:44 → 18:57	Eclipse of Enceladus by Saturn
13, 17:51 → 18:21	Occultation of Enceladus by Saturn
13, 17:53 → 19:19	Occultation of Mimas by Saturn
13, 17:57 → 19:36	Eclipse of Mimas by Saturn
13, 21:40	Conjunction Moon-γ Vir
13, 21:40	Conjunction Moon-γ Vir
14, 12:40	Lunar Transient Phenomena Lunar-X
15, 00:29	Conjunction Moon-α Vir
15, 02:10	**Moon's last quarter**
15, 02:37 → 03:51	Eclipse of Enceladus by Saturn
15, 02:43 → 03:17	Occultation of Enceladus by Saturn
15, 03:31 → 04:59	Transit of Mimas on top of Saturn
15, 03:35 → 05:14	Shadow transit of Mimas on top of Saturn
16, 11:47	Minimum of eclipsing binary β Per
16, 14:55	Minimum of eclipsing binary λ Tau
17, 01:25 → 04:32	Occultation of Ganymede by Jupiter
17, 01:59 → 04:17	Transit of Io on top of Jupiter
17, 03:14 → 05:31	Shadow transit of Io on top of Jupiter
17, 05:59	Comet C/2022 E3
17, 21:40 → 22:08	δ Sco behind Moon
18, 06:52	Conjunction Moon-σ Sco
18, 11:10	Conjunction Moon-α Sco
18, 16:54	Maximum of γ-Ursae Minorids
18, 22:14 → 22:43	NGC6273 (M19) behind Moon
19, 00:27 → 00:59	NGC6293 behind Moon
19, 08:36	Minimum of eclipsing binary β Per
19, 18:30	Minimum of eclipsing binary β Lyr
19, 20:37 → 22:08	Transit of Mimas on top of Saturn
19, 20:40 → 22:22	Shadow transit of Mimas on top of Saturn
19, 21:45 → 22:18	NGC6540 behind Moon
19, 21:50 → 23:03	Shadow transit of Enceladus on top of Saturn
19, 21:53 → 22:35	Transit of Enceladus on top of Saturn
20, 05:06	Moon's minimum declination (-27.460°)
20, 12:45	Minimum distance from Sun of Jupiter (4.951 AU)
20, 13:47	Minimum of eclipsing binary λ Tau
20, 14:59 → 17:17	Transit of Io on top of Jupiter
20, 15:44 → 18:50	Transit of Ganymede on top of Jupiter
20, 16:12 → 18:29	Shadow transit of Io on top of Jupiter
20, 18:32	Conjunction Venus-γ Cap
20, 20:00 → 20:21	τ Sgr behind Moon
21, 06:43 → 07:57	Shadow transit of Enceladus on top of Saturn
21, 06:45 → 07:31	Transit of Enceladus on top of Saturn
21, 06:50 → 08:22	Occultation of Mimas by Saturn
21, 06:53 → 08:35	Eclipse of Mimas by Saturn
21, 20:53	**New Moon**
21, 20:58	Moon's perigee (parallax = 1° 1' 30.979")
22, 05:25	Minimum of eclipsing binary β Per
22, 15:36 → 16:51	Shadow transit of Enceladus on top of Saturn
22, 15:38 → 16:26	Transit of Enceladus on top of Saturn
22, 16:28 → 18:02	Transit of Mimas on top of Saturn
22, 16:32 → 18:14	Shadow transit of Mimas on top of Saturn
22, 22:15	Conjunction Venus-Saturn
23, 08:02	Conjunction Moon-Saturn
23, 09:14	Conjunction Moon-Venus
24, 03:58 → 06:16	Transit of Io on top of Jupiter
24, 05:10 → 07:26	Shadow transit of Io on top of Jupiter
24, 05:43 → 08:49	Occultation of Ganymede by Jupiter
24, 12:39	Minimum of eclipsing binary λ Tau
25, 02:14	Minimum of eclipsing binary β Per
25, 06:58	Conjunction Moon-Neptune
26, 03:44	Conjunction Moon-Jupiter
26, 05:59	Comet 96P/Machholz MPEC 2023-E68 starts to be visible to naked eye
27, 09:34 → 11:12	Transit of Mimas on top of Saturn
27, 09:37 → 11:21	Shadow transit of Mimas on top of Saturn
27, 10:36 → 11:35	Occultation of Enceladus by Saturn
27, 10:36 → 11:53	Eclipse of Enceladus by Saturn
27, 16:58 → 19:16	Transit of Io on top of Jupiter
27, 18:08 → 20:24	Shadow transit of Io on top of Jupiter
27, 20:05 → 23:10	Transit of Ganymede on top of Jupiter
27, 23:03	Minimum of eclipsing binary β Per
28, 11:32	Minimum of eclipsing binary λ Tau
28, 15:19	**Moon's first quarter**
28, 18:49	Conjunction Mercury-ξ Sgr
28, 19:29 → 20:30	Occultation of Enceladus by Saturn
28, 19:29 → 20:47	Eclipse of Enceladus by Saturn
28, 19:47 → 21:25	Occultation of Mimas by Saturn
28, 19:50 → 21:34	Eclipse of Mimas by Saturn
29, 02:18	Lunar Transient Phenomena Lunar-X
29, 04:40	Conjunction Moon-Uranus
30, 04:22 → 05:25	Occultation of Enceladus by Saturn
30, 04:23 → 05:41	Eclipse of Enceladus by Saturn
30, 05:26 → 07:05	Transit of Mimas on top of Saturn
30, 05:29 → 07:13	Shadow transit of Mimas on top of Saturn
30, 05:55	Maximum elongation of Mercury (24.964° W)
30, 10:51	Conjunction Mercury-o Sgr
30, 19:52	Minimum of eclipsing binary β Per
30, 23:59	Comet 96P/Machholz MPEC 2023-E68 with maximum magnitude
31, 02:00	Minimum distance from Sun of 96P/Machholz MPEC 2023-E68 (0.116 AU)
31, 05:29	Conjunction Moon-Mars
31, 11:59	Minimum distance of 96P/Machholz MPEC 2023-E68 (0.886 AU)
31, 13:08	Conjunction Mercury-π Sgr

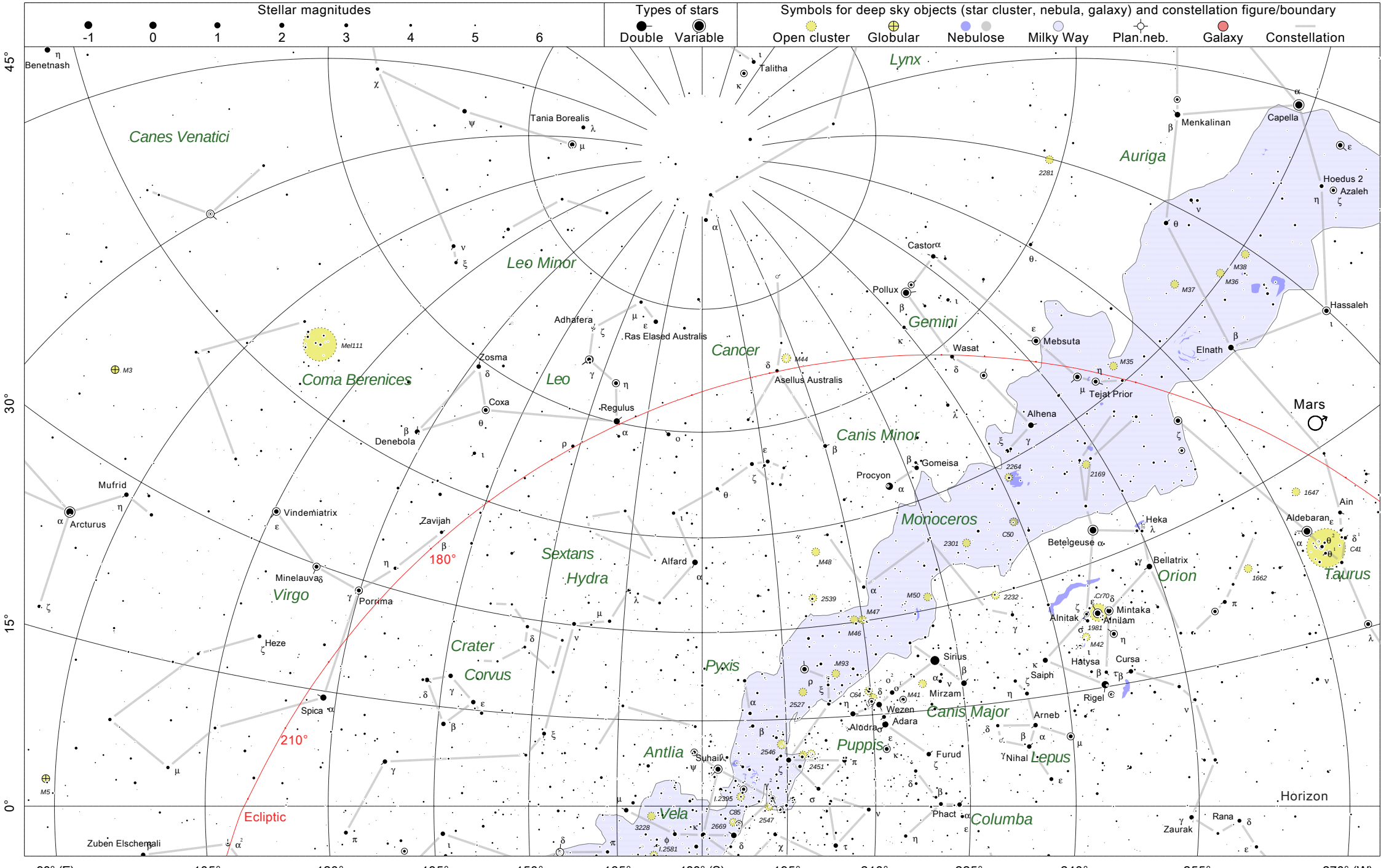
Sky on January 15, 2023, 00:00 h (UT)



Astronomical events for February

Date (UT)	Event description
1, 05:59	Comet C/2022 E3 (ZTF) MPEC 2023-E68 with maximum magnitude
1, 10:24	Minimum of eclipsing binary λ Tau
1, 17:05	Minimum of eclipsing binary β Lyr
1, 17:59	Minimum distance of C/2022 E3 ZTF MPEC 2023-E68 (0.284 AU)
2, 08:18	Moon's maximum declination (27.509°)
2, 12:52 → 14:34	Occultation of Mimas by Saturn
2, 12:55 → 14:40	Eclipse of Mimas by Saturn
2, 14:33 → 15:22	NGC2266 behind Moon
2, 14:40 → 15:47	Transit of Enceladus on top of Saturn
2, 14:41 → 15:59	Shadow transit of Enceladus on top of Saturn
2, 16:41	Minimum of eclipsing binary β Per
2, 22:49 → 3, 03:10	Occultation of Iapetus by Saturn
2, 23:55 → 3, 01:37	Transit of Mimas on top of Saturn
2, 23:57 → 3, 01:43	Shadow transit of Mimas on top of Saturn
3, 08:16 → 08:19	Eclipse of Iapetus by Tethys (31.8%)
3, 19:06	Conjunction Moon-β Gem
3, 22:32 → 4, 00:15	Transit of Mimas on top of Saturn
3, 22:34 → 4, 00:20	Shadow transit of Mimas on top of Saturn
3, 23:33 → 4, 00:42	Transit of Enceladus on top of Saturn
3, 23:35 → 4, 00:53	Shadow transit of Enceladus on top of Saturn
4, 08:55	Moon's apogee (parallax = 53' 56.706")
5, 05:59	Comet 96P/Machholz MPEC 2023-E68 ends to be visible to naked eye
5, 08:26 → 09:37	Transit of Enceladus on top of Saturn
5, 08:28 → 09:46	Shadow transit of Enceladus on top of Saturn
5, 08:43 → 10:27	Occultation of Mimas by Saturn
5, 08:46 → 10:32	Eclipse of Mimas by Saturn
5, 09:16	Minimum of eclipsing binary λ Tau
5, 13:30	Minimum of eclipsing binary β Per
5, 18:29	Full Moon
6, 13:25	Conjunction C/2022 E3 (ZTF) MPEC 2023-E68-ϵ Aur
6, 16:24	Conjunction Moon-η Leo
6, 17:19 → 18:32	Transit of Enceladus on top of Saturn
6, 17:21 → 18:40	Shadow transit of Enceladus on top of Saturn
6, 18:23 → 20:08	Transit of Mimas on top of Saturn
6, 18:26 → 20:12	Shadow transit of Mimas on top of Saturn
6, 19:22	Conjunction Moon-α Leo
7, 00:44	Conjunction C/2022 E3 (ZTF) MPEC 2023-E68-η Aur
7, 02:20	Conjunction C/2022 E3 (ZTF) MPEC 2023-E68-ζ Aur
7, 13:20 → 13:40	NGC3351 (M95) behind Moon
7, 14:05 → 14:46	NGC3368 (M96) behind Moon
8, 10:19	Minimum of eclipsing binary β Per
8, 13:47	Maximum of α-Centaurids
8, 22:14	Conjunction C/2022 E3 (ZTF) MPEC 2023-E68-ι Aur
9, 08:08	Minimum of eclipsing binary λ Tau
9, 17:38	Conjunction Moon-η Vir
10, 01:49 → 03:36	Occultation of Mimas by Saturn
10, 01:51 → 03:39	Eclipse of Mimas by Saturn
10, 03:26 → 04:44	Occultation of Enceladus by Saturn
10, 03:28 → 04:49	Eclipse of Enceladus by Saturn
11, 07:08	Minimum of eclipsing binary β Per
11, 08:42	Conjunction Moon-α Vir
11, 11:30 → 13:17	Transit of Mimas on top of Saturn
11, 11:31 → 13:19	Shadow transit of Mimas on top of Saturn
11, 12:18	Conjunction Mars-C/2022 E3 (ZTF) MPEC 2023-E68
11, 12:20 → 13:39	Occultation of Enceladus by Saturn
11, 12:21 → 13:43	Eclipse of Enceladus by Saturn
12, 21:13 → 22:34	Occultation of Enceladus by Saturn
12, 21:14 → 22:36	Eclipse of Enceladus by Saturn
12, 21:40 → 23:29	Occultation of Mimas by Saturn
12, 21:42 → 23:31	Eclipse of Mimas by Saturn
13, 03:03	Lunar Transient Phenomena Lunar-X
13, 07:00	Minimum of eclipsing binary λ Tau
13, 16:01	**Moon's last quarter**
13, 16:20	Conjunction C/2022 E3 (ZTF) MPEC 2023-E68-NGC1647
13, 17:59	Comet C/2022 E3
14, 03:57	Minimum of eclipsing binary β Per
14, 06:06 → 07:29	Occultation of Enceladus by Saturn
14, 06:08 → 07:30	Eclipse of Enceladus by Saturn
14, 07:22 → 09:11	Transit of Mimas on top of Saturn
14, 07:23 → 09:12	Shadow transit of Mimas on top of Saturn
14, 15:39	Minimum of eclipsing binary β Lyr
14, 16:25	Conjunction Moon-σ Sco
14, 19:10	Conjunction Moon-α Sco
15, 12:26	Conjunction Venus-Neptune
16, 14:36	Moon's minimum declination (-27.626°)
16, 16:49	Conjunction of Saturn (elongation 1.259°)
16, 21:58	Conjunction Moon-ϕ Sgr
17, 00:46	Minimum of eclipsing binary β Per
17, 04:38	Conjunction Moon-τ Sgr
17, 05:53	Minimum of eclipsing binary λ Tau
17, 14:46 → 16:38	Occultation of Mimas by Saturn
17, 14:46 → 16:37	Eclipse of Mimas by Saturn
17, 16:24 → 17:50	Transit of Enceladus on top of Saturn
17, 16:26 → 17:48	Shadow transit of Enceladus on top of Saturn
18, 22:40	Conjunction Moon-Mercury
19, 00:28 → 02:20	Transit of Mimas on top of Saturn
19, 00:28 → 02:19	Shadow transit of Mimas on top of Saturn
19, 01:18 → 02:44	Transit of Enceladus on top of Saturn
19, 01:19 → 02:41	Shadow transit of Enceladus on top of Saturn
19, 09:06	Moon's perigee (parallax = 1° 1' 11.341")
19, 21:35	Minimum of eclipsing binary β Per
20, 01:26	Conjunction Moon-Saturn
20, 07:06	**New Moon**
20, 10:11 → 11:39	Transit of Enceladus on top of Saturn
20, 10:12 → 11:35	Shadow transit of Enceladus on top of Saturn
20, 10:37 → 12:31	Occultation of Mimas by Saturn
20, 10:37 → 12:29	Eclipse of Mimas by Saturn
21, 04:45	Minimum of eclipsing binary λ Tau
21, 19:04 → 20:34	Transit of Enceladus on top of Saturn
21, 19:05 → 20:28	Shadow transit of Enceladus on top of Saturn
21, 20:20 → 22:11	Shadow transit of Mimas on top of Saturn
21, 20:20 → 22:13	Transit of Mimas on top of Saturn
21, 21:28	Conjunction Moon-Neptune
22, 09:11	Conjunction Moon-Venus
22, 18:24	Minimum of eclipsing binary β Per
23, 24:00	Conjunction Moon-Jupiter
25, 03:37	Minimum of eclipsing binary λ Tau
25, 03:42 → 05:35	Eclipse of Mimas by Saturn
25, 03:43 → 05:39	Occultation of Mimas by Saturn
25, 05:12 → 06:46	Occultation of Enceladus by Saturn
25, 05:13 → 06:38	Eclipse of Enceladus by Saturn
25, 11:18	Conjunction Moon-Uranus
25, 15:13	Minimum of eclipsing binary β Per
26, 05:02	Conjunction Mercury-γ Cap
26, 13:25 → 15:18	Shadow transit of Mimas on top of Saturn
26, 13:26 → 15:22	Transit of Mimas on top of Saturn
26, 14:05 → 15:40	Occultation of Enceladus by Saturn
26, 14:06 → 15:31	Eclipse of Enceladus by Saturn
27, 06:47	Conjunction Mercury-δ Cap
27, 08:06	**Moon's first quarter**
27, 14:14	Minimum of eclipsing binary β Lyr
27, 16:42	Lunar Transient Phenomena Lunar-X
27, 22:59 → 28, 00:35	Occultation of Enceladus by Saturn
27, 22:59 → 28, 00:25	Eclipse of Enceladus by Saturn
27, 23:33 → 28, 01:26	Eclipse of Mimas by Saturn
27, 23:34 → 28, 01:32	Occultation of Mimas by Saturn
28, 05:08	Conjunction Moon-Mars
28, 12:02	Minimum of eclipsing binary β Per

Sky on February 15, 2023, 00:00 h (UT)

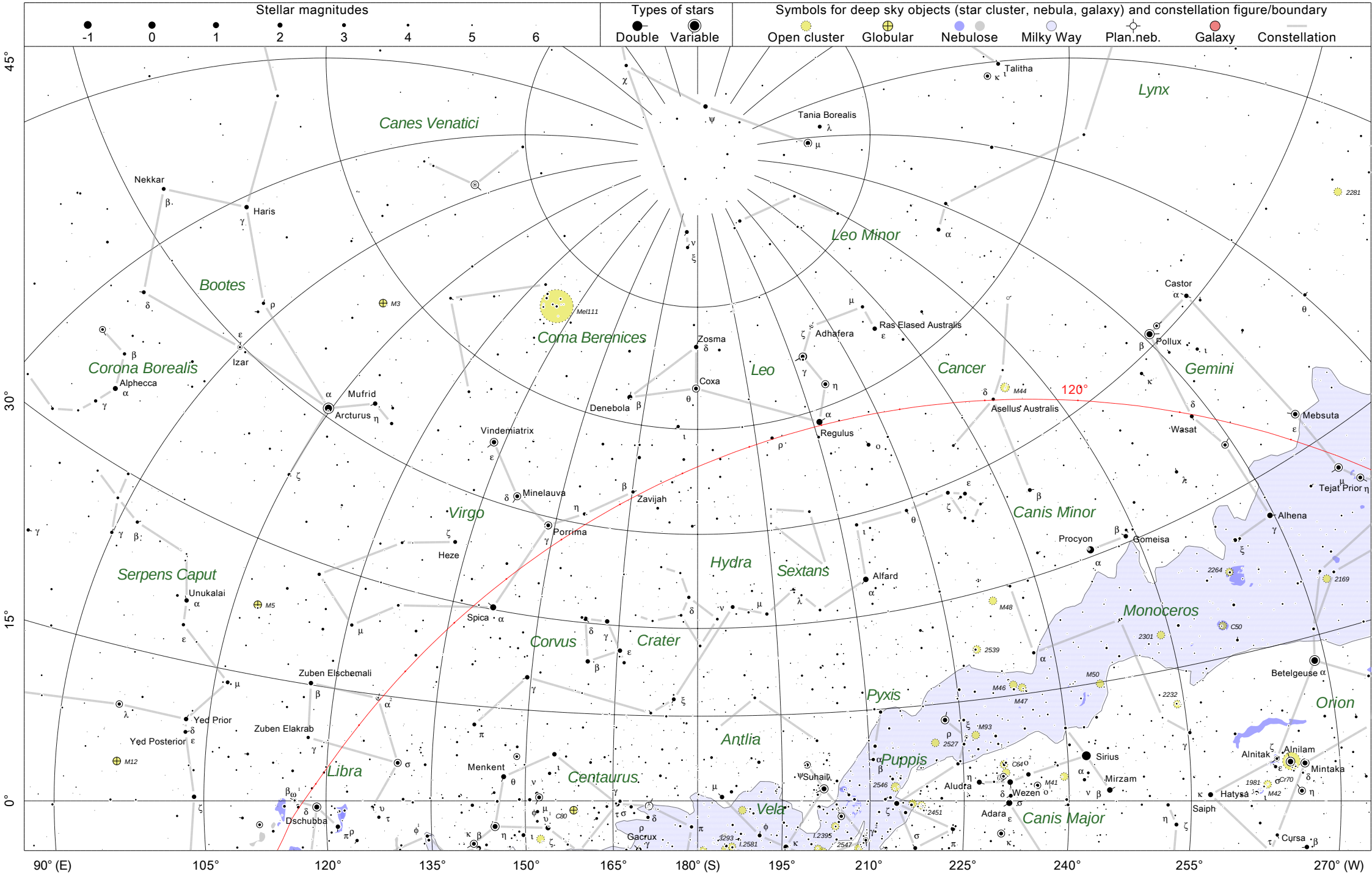


90° (E) 105° 120° 135° 150° 165° 180° (S) 195° 210° 225° 240° 255° 270° (W)

Astronomical events for March

Date (UT)	Event description
1, 02:29	Minimum of eclipsing binary λ Tau
1, 07:52 → 09:29	Occultation of Enceladus by Saturn
1, 07:52 → 09:18	Eclipse of Enceladus by Saturn
1, 09:17 → 11:10	Shadow transit of Mimas on top of Saturn
1, 09:19 → 11:15	Transit of Mimas on top of Saturn
1, 14:09	Moon's maximum declination (27.713°)
2, 05:06	Conjunction Venus-Jupiter
2, 14:31	Conjunction Mercury-Saturn
2, 16:45 → 18:24	Occultation of Enceladus by Saturn
2, 16:45 → 18:12	Eclipse of Enceladus by Saturn
2, 18:00 → 18:19	Occultation of Tethys by Saturn
3, 02:40	Conjunction Moon-β Gem
3, 08:51	Minimum of eclipsing binary β Per
3, 18:01	Moon's apogee (parallax = 54' 1.377")
4, 16:37 → 18:32	Eclipse of Mimas by Saturn
4, 16:40 → 18:40	Occultation of Mimas by Saturn
4, 18:10 → 19:36	Shadow transit of Enceladus on top of Saturn
4, 18:10 → 19:50	Transit of Enceladus on top of Saturn
5, 01:22	Minimum of eclipsing binary λ Tau
5, 23:39	Conjunction Moon-η Leo
6, 02:23 → 04:17	Shadow transit of Mimas on top of Saturn
6, 02:25 → 04:24	Transit of Mimas on top of Saturn
6, 03:03 → 04:30	Shadow transit of Enceladus on top of Saturn
6, 03:04 → 04:44	Transit of Enceladus on top of Saturn
6, 05:38	Conjunction Moon-α Leo
6, 05:40	Minimum of eclipsing binary β Per
7, 11:56 → 13:23	Shadow transit of Enceladus on top of Saturn
7, 11:57 → 13:38	Transit of Enceladus on top of Saturn
7, 12:28 → 14:24	Eclipse of Mimas by Saturn
7, 12:31 → 14:32	Occultation of Mimas by Saturn
7, 12:40	Full Moon
8, 08:21 → 11:17	Occultation of Ganymede by Jupiter
8, 10:56 → 13:31	Eclipse of Ganymede by Jupiter
8, 13:15 → 15:32	Occultation of Io by Jupiter
8, 13:51 → 16:07	Eclipse of Io by Jupiter
8, 20:49 → 22:16	Shadow transit of Enceladus on top of Saturn
8, 20:50 → 22:33	Transit of Enceladus on top of Saturn
8, 22:14 → 9, 00:09	Shadow transit of Mimas on top of Saturn
8, 22:17 → 9, 00:17	Transit of Mimas on top of Saturn
9, 00:14	Minimum of eclipsing binary λ Tau
9, 00:19	Conjunction Moon-η Vir
9, 02:29	Minimum of eclipsing binary β Per
10, 05:42 → 07:10	Shadow transit of Enceladus on top of Saturn
10, 05:43 → 07:27	Transit of Enceladus on top of Saturn
10, 07:02 → 07:56	Occultation of Tethys by Saturn
10, 13:03	Conjunction Moon-α Vir
11, 22:49 → 12, 01:44	Transit of Ganymede on top of Jupiter
11, 23:18	Minimum of eclipsing binary β Per
12, 01:10 → 03:44	Shadow transit of Ganymede on top of Jupiter
12, 02:16 → 04:33	Occultation of Io by Jupiter
12, 02:49 → 05:05	Eclipse of Io by Jupiter
12, 05:33 → 07:30	Eclipse of Mimas by Saturn
12, 05:36 → 07:40	Occultation of Mimas by Saturn
12, 06:57 → 08:26	Eclipse of Enceladus by Saturn
12, 06:59 → 08:44	Occultation of Enceladus by Saturn
12, 12:49	Minimum of eclipsing binary β Lyr
12, 23:06	Minimum of eclipsing binary λ Tau
13, 13:30	Conjunction Moon-δ Sco
13, 15:20 → 17:15	Shadow transit of Mimas on top of Saturn
13, 15:24 → 17:25	Transit of Mimas on top of Saturn
13, 15:50 → 17:19	Eclipse of Enceladus by Saturn
13, 15:52 → 17:39	Occultation of Enceladus by Saturn
13, 20:56	Conjunction Moon-σ Sco
13, 20:56 → 21:00	Eclipse of Rhea by Iapetus (53.6%)
14, 00:24	Conjunction Moon-α Sco
14, 16:27	Lunar Transient Phenomena Lunar-X
14, 17:21 → 17:37	NGC6293 behind Moon
14, 20:07	Minimum of eclipsing binary β Per
15, 00:15 → 01:22	Transit of Tethys on top of Saturn
15, 00:43 → 02:13	Eclipse of Enceladus by Saturn
15, 00:45 → 02:33	Occultation of Enceladus by Saturn
15, 01:23 → 03:21	Eclipse of Mimas by Saturn
15, 01:28 → 03:32	Occultation of Mimas by Saturn
15, 02:08	**Moon's last quarter**
15, 04:30	Maximum of γ-Normids
15, 12:53 → 15:47	Occultation of Ganymede by Jupiter
15, 14:53 → 15:12	NGC6520 behind Moon
15, 14:58 → 17:32	Eclipse of Ganymede by Jupiter
15, 15:17 → 17:35	Occultation of Io by Jupiter
15, 15:47 → 18:02	Eclipse of Io by Jupiter
15, 21:43	Moon's minimum declination (-27.828°)
15, 22:54 → 16, 00:03	Occultation of Tethys by Saturn
15, 23:38	Conjunction of Neptune (elongation 1.169°)
16, 24:00 → 01:58	Eclipse of Mimas by Saturn
16, 00:05 → 02:10	Occultation of Mimas by Saturn
16, 09:36 → 11:06	Eclipse of Enceladus by Saturn
16, 09:39 → 11:27	Occultation of Enceladus by Saturn
16, 11:11 → 13:07	Shadow transit of Mimas on top of Saturn
16, 11:16 → 13:18	Transit of Mimas on top of Saturn
16, 14:46 → 15:24	τ Sgr behind Moon
16, 17:29	Conjunction Mercury-Neptune
16, 21:33 → 22:44	Transit of Tethys on top of Saturn
16, 21:58	Minimum of eclipsing binary λ Tau
16, 22:37 → 17, 00:35	Eclipse of Mimas by Saturn
16, 22:42 → 17, 00:47	Occultation of Mimas by Saturn
17, 14:55	Minimum elongation of Mercury (1.459°)
17, 16:55	Minimum of eclipsing binary β Per
17, 18:29 → 20:00	Eclipse of Enceladus by Saturn
17, 18:32 → 20:22	Occultation of Enceladus by Saturn
17, 20:11 → 21:25	Occultation of Tethys by Saturn
17, 21:14 → 23:12	Eclipse of Mimas by Saturn
17, 21:19 → 23:25	Occultation of Mimas by Saturn
18, 18:51 → 20:06	Transit of Tethys on top of Saturn
18, 19:51 → 21:49	Eclipse of Mimas by Saturn
18, 19:56 → 22:02	Occultation of Mimas by Saturn
19, 03:22 → 06:15	Transit of Ganymede on top of Jupiter
19, 04:19 → 06:36	Occultation of Io by Jupiter
19, 04:44 → 07:00	Eclipse of Io by Jupiter
19, 05:13 → 07:45	Shadow transit of Ganymede on top of Jupiter
19, 15:16	Moon's perigee (parallax = 1° 0' 27.250")
19, 17:29 → 18:46	Occultation of Tethys by Saturn
19, 18:28 → 20:27	Eclipse of Mimas by Saturn
19, 18:33 → 20:40	Occultation of Mimas by Saturn
19, 18:59	Conjunction Moon-Saturn
19, 19:54 → 21:24	Shadow transit of Enceladus on top of Saturn
19, 19:57 → 21:47	Transit of Enceladus on top of Saturn
20, 13:44	Minimum of eclipsing binary β Per
20, 16:08 → 17:27	Transit of Tethys on top of Saturn
20, 17:05 → 19:04	Eclipse of Mimas by Saturn
20, 17:10 → 19:17	Occultation of Mimas by Saturn
20, 20:50	Minimum of eclipsing binary λ Tau
20, 21:24	Spring equinox
20, 23:59	New Persian
21, 04:17 → 06:14	Shadow transit of Mimas on top of Saturn
21, 04:23 → 06:27	Transit of Mimas on top of Saturn
21, 04:47 → 06:17	Shadow transit of Enceladus on top of Saturn
21, 04:50 → 06:42	Transit of Enceladus on top of Saturn
21, 08:36	Conjunction Moon-Neptune
21, 14:47 → 16:08	Occultation of Tethys by Saturn
21, 15:42 → 17:41	Eclipse of Mimas by Saturn
21, 15:48 → 17:54	Occultation of Mimas by Saturn
21, 17:23	**New Moon**
22, 01:33	Conjunction Moon-Mercury
22, 13:27 → 14:49	Transit of Tethys on top of Saturn
22, 13:40 → 15:10	Shadow transit of Enceladus on top of Saturn
22, 13:43 → 15:36	Transit of Enceladus on top of Saturn
22, 14:19 → 16:18	Eclipse of Mimas by Saturn
22, 14:25 → 16:32	Occultation of Mimas by Saturn
22, 17:20 → 19:37	Occultation of Io by Jupiter
22, 17:25 → 20:16	Occultation of Ganymede by Jupiter
22, 17:42 → 19:58	Eclipse of Io by Jupiter
22, 19:00 → 21:32	Eclipse of Ganymede by Jupiter
22, 21:41	Conjunction Moon-Jupiter
23, 10:33	Minimum of eclipsing binary β Per
23, 12:05 → 13:29	Occultation of Tethys by Saturn
23, 12:56 → 14:55	Eclipse of Mimas by Saturn
23, 13:02 → 15:09	Occultation of Mimas by Saturn
23, 22:33 → 24, 00:04	Shadow transit of Enceladus on top of Saturn
23, 22:37 → 24, 00:30	Transit of Enceladus on top of Saturn
24, 00:09 → 02:06	Shadow transit of Mimas on top of Saturn
24, 00:15 → 02:19	Transit of Mimas on top of Saturn
24, 09:59	Conjunction Moon-Venus
24, 10:45 → 12:10	Transit of Tethys on top of Saturn
24, 11:33 → 13:32	Eclipse of Mimas by Saturn
24, 11:39 → 13:47	Occultation of Mimas by Saturn
24, 19:43	Minimum of eclipsing binary λ Tau
25, 00:58	Conjunction Moon-Uranus
25, 07:26 → 08:57	Shadow transit of Enceladus on top of Saturn
25, 07:30 → 09:24	Transit of Enceladus on top of Saturn
25, 09:23 → 10:50	Occultation of Tethys by Saturn
25, 10:09 → 12:09	Eclipse of Mimas by Saturn
25, 10:16 → 12:24	Occultation of Mimas by Saturn
25, 11:24	Minimum of eclipsing binary β Lyr
26, 06:21 → 08:38	Occultation of Io by Jupiter
26, 06:39 → 08:55	Eclipse of Io by Jupiter
26, 07:22	Minimum of eclipsing binary β Per
26, 07:55 → 10:45	Transit of Ganymede on top of Jupiter
26, 08:03 → 09:31	Transit of Tethys on top of Saturn
26, 08:46 → 10:46	Eclipse of Mimas by Saturn
26, 08:53 → 11:02	Occultation of Mimas by Saturn
26, 09:15 → 11:46	Shadow transit of Ganymede on top of Jupiter
27, 06:42 → 08:12	Occultation of Tethys by Saturn
27, 07:23 → 09:23	Eclipse of Mimas by Saturn
27, 07:30 → 09:39	Occultation of Mimas by Saturn
27, 08:41 → 10:14	Eclipse of Enceladus by Saturn
27, 08:46 → 10:41	Occultation of Enceladus by Saturn
28, 05:04	Conjunction Mercury-Jupiter
28, 05:21 → 06:52	Transit of Tethys on top of Saturn
28, 06:00 → 08:00	Eclipse of Mimas by Saturn
28, 06:07 → 08:16	Occultation of Mimas by Saturn
28, 11:11	Conjunction Moon-Mars
28, 17:14 → 19:13	Shadow transit of Mimas on top of Saturn
28, 17:21 → 19:27	Transit of Mimas on top of Saturn
28, 17:34 → 19:07	Eclipse of Enceladus by Saturn
28, 17:39 → 19:35	Occultation of Enceladus by Saturn
28, 18:35	Minimum of eclipsing binary λ Tau
28, 21:28	Moon's maximum declination (27.896°)
29, 02:32	**Moon's first quarter**
29, 04:00 → 05:33	Occultation of Tethys by Saturn
29, 04:11	Minimum of eclipsing binary β Per
29, 04:37 → 06:37	Eclipse of Mimas by Saturn
29, 04:44 → 06:54	Occultation of Mimas by Saturn
29, 05:51 → 06:34	NGC2266 behind Moon
29, 06:40	Lunar Transient Phenomena Lunar-X
29, 14:56 → 16:14	NGC2331 behind Moon
30, 02:27 → 04:00	Eclipse of Enceladus by Saturn
30, 02:32 → 04:29	Occultation of Enceladus by Saturn
30, 02:39 → 04:13	Transit of Tethys on top of Saturn
30, 03:14 → 05:14	Eclipse of Mimas by Saturn
30, 03:21 → 05:31	Occultation of Mimas by Saturn
30, 09:07	Conjunction Moon-β Gem
30, 21:43	Conjunction Venus-Uranus
31, 01:18 → 02:54	Occultation of Tethys by Saturn
31, 01:51 → 03:52	Eclipse of Mimas by Saturn
31, 01:58 → 04:08	Occultation of Mimas by Saturn
31, 11:18	Moon's apogee (parallax = 54' 9.140")
31, 11:20 → 12:54	Eclipse of Enceladus by Saturn
31, 11:26 → 13:23	Occultation of Enceladus by Saturn
31, 13:06 → 15:05	Shadow transit of Mimas on top of Saturn
31, 13:14 → 15:20	Transit of Mimas on top of Saturn

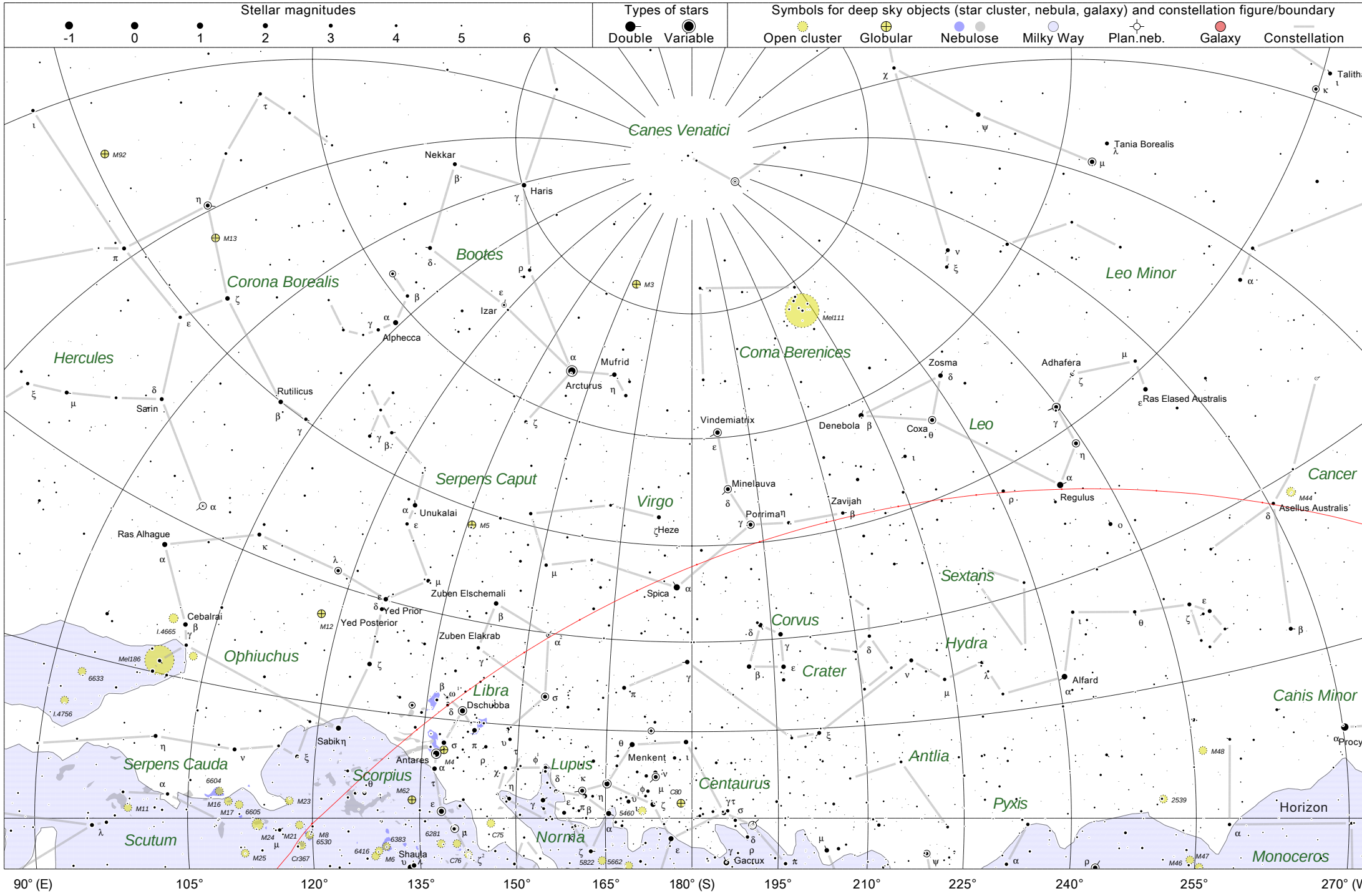
Sky on March 15, 2023, 00:00 h (UT)



Astronomical events for April

Date (UT)	Event description
31, 23:57 → 1, 01:34	Transit of Tethys on top of Saturn
1, 00:28 → 02:29	Eclipse of Mimas by Saturn
1, 00:36 → 02:46	Occultation of Mimas by Saturn
1, 01:00	Minimum of eclipsing binary β Per
1, 17:27	Minimum of eclipsing binary λ Tau
1, 22:36 → 2, 00:15	Occultation of Tethys by Saturn
1, 23:05 → 2, 01:06	Eclipse of Mimas by Saturn
1, 23:13 → 2, 01:23	Occultation of Mimas by Saturn
2, 07:37	Conjunction Moon-η Leo
2, 10:06	Conjunction Moon-α Leo
2, 21:16 → 22:55	Transit of Tethys on top of Saturn
2, 21:41 → 23:43	Eclipse of Mimas by Saturn
2, 21:50 → 3, 24:00	Occultation of Mimas by Saturn
3, 04:01 → 04:52	NGC3351 (M95) behind Moon
3, 19:55 → 21:35	Occultation of Tethys by Saturn
3, 20:18 → 22:20	Eclipse of Mimas by Saturn
3, 20:27 → 22:38	Occultation of Mimas by Saturn
3, 21:37 → 23:11	Shadow transit of Enceladus on top of Saturn
3, 21:43 → 23:43	Transit of Enceladus on top of Saturn
3, 21:49	Minimum of eclipsing binary β Per
4, 18:34 → 20:16	Transit of Tethys on top of Saturn
4, 18:55 → 20:57	Eclipse of Mimas by Saturn
4, 19:04 → 21:15	Occultation of Mimas by Saturn
5, 06:12 → 08:11	Shadow transit of Mimas on top of Saturn
5, 06:20 → 08:28	Transit of Mimas on top of Saturn
5, 06:30 → 08:04	Shadow transit of Enceladus on top of Saturn
5, 06:37 → 08:37	Transit of Enceladus on top of Saturn
5, 08:17	Conjunction Moon-η Vir
5, 16:16	Conjunction Moon-γ Vir
5, 16:17	Conjunction Moon-γ Vir
5, 16:19	Minimum of eclipsing binary λ Tau
5, 17:13 → 18:56	Occultation of Tethys by Saturn
5, 17:32 → 19:34	Eclipse of Mimas by Saturn
5, 17:41 → 19:52	Occultation of Mimas by Saturn
6, 04:34	Full Moon
6, 15:23 → 16:57	Shadow transit of Enceladus on top of Saturn
6, 15:30 → 17:31	Transit of Enceladus on top of Saturn
6, 15:53 → 17:36	Transit of Tethys on top of Saturn
6, 16:09 → 18:11	Eclipse of Mimas by Saturn
6, 16:18 → 18:30	Occultation of Mimas by Saturn
6, 18:41	Conjunction Moon-α Vir
7, 09:58	Minimum of eclipsing binary β Lyr
7, 14:32 → 16:17	Occultation of Tethys by Saturn
7, 14:46 → 16:48	Eclipse of Mimas by Saturn
7, 14:55 → 17:07	Occultation of Mimas by Saturn
8, 00:16 → 01:51	Shadow transit of Enceladus on top of Saturn
8, 00:23 → 02:24	Transit of Enceladus on top of Saturn
8, 02:03 → 04:03	Shadow transit of Mimas on top of Saturn
8, 02:12 → 04:21	Transit of Mimas on top of Saturn
8, 13:11 → 14:57	Transit of Tethys on top of Saturn
8, 13:23 → 15:25	Eclipse of Mimas by Saturn
8, 13:32 → 15:44	Occultation of Mimas by Saturn
8, 23:59	Easter date
9, 11:50 → 13:37	Occultation of Tethys by Saturn
9, 12:00 → 14:02	Eclipse of Mimas by Saturn
9, 12:09 → 14:22	Occultation of Mimas by Saturn
9, 12:09 → 12:22	Eclipse of Tethys by Saturn
9, 17:13	Conjunction Moon-δ Sco
9, 23:18 → 10, 01:18	Shadow transit of Mimas on top of Saturn
9, 23:27 → 10, 01:36	Transit of Mimas on top of Saturn
10, 01:32 → 03:07	Eclipse of Enceladus by Saturn
10, 01:39 → 03:41	Occultation of Enceladus by Saturn
10, 02:49 → 03:21	σ Sco behind Moon
10, 07:44	Conjunction Moon-α Sco
10, 10:30 → 12:17	Transit of Tethys on top of Saturn
10, 10:36 → 12:39	Eclipse of Mimas by Saturn
10, 10:46 → 12:59	Occultation of Mimas by Saturn
10, 10:48 → 11:02	Shadow transit of Tethys on top of Saturn
11, 09:09 → 10:58	Occultation of Tethys by Saturn
11, 09:13 → 11:16	Eclipse of Mimas by Saturn
11, 09:24 → 11:36	Occultation of Mimas by Saturn
11, 09:25 → 09:43	Eclipse of Tethys by Saturn
11, 10:25 → 12:01	Eclipse of Enceladus by Saturn
11, 10:33 → 12:35	Occultation of Enceladus by Saturn
11, 18:35 → 19:02	NGC6520 behind Moon
11, 22:05	Maximum elongation of Mercury (19.490° E)
11, 22:11	Conjunction of Jupiter (elongation 1.063°)
12, 03:15	Moon's minimum declination (-27.946°)
12, 07:48 → 09:38	Transit of Tethys on top of Saturn
12, 07:50 → 09:53	Eclipse of Mimas by Saturn
12, 08:01 → 10:13	Occultation of Mimas by Saturn
12, 08:03 → 08:24	Shadow transit of Tethys on top of Saturn
12, 18:53 → 19:29	τ Sgr behind Moon
12, 19:09 → 21:09	Shadow transit of Mimas on top of Saturn
12, 19:18 → 20:54	Eclipse of Enceladus by Saturn
12, 19:19 → 21:28	Transit of Mimas on top of Saturn
12, 19:26 → 21:29	Occultation of Enceladus by Saturn
13, 04:45	Lunar Transient Phenomena Lunar-X
13, 06:27 → 08:30	Eclipse of Mimas by Saturn
13, 06:27 → 08:18	Occultation of Tethys by Saturn
13, 06:38 → 08:51	Occultation of Mimas by Saturn
13, 06:41 → 07:04	Eclipse of Tethys by Saturn
13, 09:11	**Moon's last quarter**
13, 23:59	New Hindu solar year
14, 04:11 → 05:47	Eclipse of Enceladus by Saturn
14, 04:19 → 06:23	Occultation of Enceladus by Saturn
14, 05:04 → 07:07	Eclipse of Mimas by Saturn
14, 05:06 → 06:58	Transit of Tethys on top of Saturn
14, 05:15 → 07:28	Occultation of Mimas by Saturn
14, 05:20 → 05:45	Shadow transit of Tethys on top of Saturn
14, 18:10	Conjunction Mars-ϵ Gem
15, 03:41 → 05:44	Eclipse of Mimas by Saturn
15, 03:46 → 05:38	Occultation of Tethys by Saturn
15, 03:52 → 06:05	Occultation of Mimas by Saturn
15, 03:58 → 04:25	Eclipse of Tethys by Saturn
15, 13:04 → 14:41	Eclipse of Enceladus by Saturn
15, 13:13 → 15:17	Occultation of Enceladus by Saturn
15, 15:01 → 17:01	Shadow transit of Mimas on top of Saturn
15, 15:11 → 17:21	Transit of Mimas on top of Saturn
16, 02:18 → 04:21	Eclipse of Mimas by Saturn
16, 02:22	Moon's perigee (parallax = 59' 36.606")
16, 02:25 → 04:19	Transit of Tethys on top of Saturn
16, 02:29 → 04:42	Occultation of Mimas by Saturn
16, 02:37 → 03:05	Shadow transit of Tethys on top of Saturn
16, 06:27	Conjunction Moon-Saturn
17, 00:55 → 02:58	Eclipse of Mimas by Saturn
17, 01:04 → 02:59	Occultation of Tethys by Saturn
17, 01:06 → 03:20	Occultation of Mimas by Saturn
17, 01:15 → 01:45	Eclipse of Tethys by Saturn
17, 12:15 → 14:16	Shadow transit of Mimas on top of Saturn
17, 12:26 → 14:36	Transit of Mimas on top of Saturn
17, 14:27 → 16:04	Shadow transit of Enceladus on top of Saturn
17, 14:36 → 16:42	Transit of Enceladus on top of Saturn
17, 19:58	Conjunction Moon-Neptune
17, 23:32 → 18, 01:35	Eclipse of Mimas by Saturn
17, 23:43 → 18, 01:57	Occultation of Mimas by Saturn
17, 23:44 → 18, 01:39	Transit of Tethys on top of Saturn
17, 23:54 → 18, 00:25	Shadow transit of Tethys on top of Saturn
18, 22:09 → 19, 00:12	Eclipse of Mimas by Saturn
18, 22:20 → 19, 00:34	Occultation of Mimas by Saturn
18, 22:23 → 19, 00:19	Occultation of Tethys by Saturn
18, 22:32 → 23:05	Eclipse of Tethys by Saturn
18, 23:20 → 19, 00:57	Shadow transit of Enceladus on top of Saturn
18, 23:30 → 19, 01:35	Transit of Enceladus on top of Saturn
19, 18:40 → 19:24	Jupiter behind Moon
19, 20:48 → 22:49	Eclipse of Mimas by Saturn
19, 20:57 → 23:11	Occultation of Mimas by Saturn
19, 21:02 → 22:59	Transit of Tethys on top of Saturn
19, 21:11 → 21:46	Shadow transit of Tethys on top of Saturn
20, 04:12	**New Moon**
20, 04:17	**Solar eclipse (central, annular-total (hybrid))**
20, 08:06 → 10:08	Shadow transit of Mimas on top of Saturn
20, 08:13 → 09:50	Shadow transit of Enceladus on top of Saturn
20, 08:18 → 10:28	Transit of Mimas on top of Saturn
20, 08:23 → 10:29	Transit of Enceladus on top of Saturn
20, 08:33	Minimum of eclipsing binary β Lyr
20, 19:22 → 21:26	Eclipse of Mimas by Saturn
20, 19:34 → 21:48	Occultation of Mimas by Saturn
20, 19:41 → 21:39	Occultation of Tethys by Saturn
20, 19:49 → 20:26	Eclipse of Tethys by Saturn
21, 08:09	Conjunction Moon-Mercury
21, 11:05	Conjunction Moon-Uranus
21, 17:07 → 18:44	Shadow transit of Enceladus on top of Saturn
21, 17:16 → 19:23	Transit of Enceladus on top of Saturn
21, 17:59 → 20:03	Eclipse of Mimas by Saturn
21, 18:11 → 20:26	Occultation of Mimas by Saturn
21, 18:21 → 20:19	Transit of Tethys on top of Saturn
21, 18:28 → 19:06	Shadow transit of Tethys on top of Saturn
22, 06:44	Conjunction Mercury-Uranus
22, 16:36 → 18:40	Eclipse of Mimas by Saturn
22, 16:48 → 19:03	Occultation of Mimas by Saturn
22, 17:00 → 18:59	Occultation of Tethys by Saturn
22, 17:06 → 17:45	Eclipse of Tethys by Saturn
23, 01:08	Maximum of Lyrids
23, 01:59 → 03:37	Shadow transit of Enceladus on top of Saturn
23, 02:09 → 04:17	Transit of Enceladus on top of Saturn
23, 03:58 → 05:59	Shadow transit of Mimas on top of Saturn
23, 04:10 → 06:20	Transit of Mimas on top of Saturn
23, 11:06	Conjunction Moon-Venus
23, 15:13 → 17:17	Eclipse of Mimas by Saturn
23, 15:25 → 17:40	Occultation of Mimas by Saturn
23, 15:39 → 17:39	Transit of Tethys on top of Saturn
23, 15:45 → 16:25	Shadow transit of Tethys on top of Saturn
24, 06:10	Maximum of π-Puppids
24, 13:50 → 15:54	Eclipse of Mimas by Saturn
24, 14:02 → 16:17	Occultation of Mimas by Saturn
24, 14:18 → 16:19	Occultation of Tethys by Saturn
24, 14:24 → 15:05	Eclipse of Tethys by Saturn
25, 01:12 → 03:14	Shadow transit of Mimas on top of Saturn
25, 01:24 → 03:35	Transit of Mimas on top of Saturn
25, 03:15 → 04:54	Eclipse of Enceladus by Saturn
25, 03:26 → 05:33	Occultation of Enceladus by Saturn
25, 05:53	Moon's maximum declination (27.957°)
25, 12:27 → 14:31	Eclipse of Mimas by Saturn
25, 12:39 → 14:54	Occultation of Mimas by Saturn
25, 12:58 → 14:59	Transit of Tethys on top of Saturn
25, 13:03 → 13:45	Shadow transit of Tethys on top of Saturn
26, 03:32	Conjunction Moon-Mars
26, 11:04 → 13:08	Eclipse of Mimas by Saturn
26, 11:16 → 13:32	Occultation of Mimas by Saturn
26, 11:37 → 13:39	Occultation of Tethys by Saturn
26, 11:41 → 12:25	Eclipse of Tethys by Saturn
26, 12:08 → 13:48	Eclipse of Enceladus by Saturn
26, 12:19 → 14:27	Occultation of Enceladus by Saturn
26, 17:06	Conjunction Moon-β Gem
27, 09:41 → 11:45	Eclipse of Mimas by Saturn
27, 09:53 → 12:09	Occultation of Mimas by Saturn
27, 10:16 → 12:19	Transit of Tethys on top of Saturn
27, 10:20 → 11:05	Shadow transit of Tethys on top of Saturn
27, 19:54	Lunar Transient Phenomena Lunar-X
27, 21:01 → 22:41	Eclipse of Enceladus by Saturn
27, 21:04 → 23:06	Shadow transit of Mimas on top of Saturn
27, 21:13 → 23:21	Occultation of Enceladus by Saturn
27, 21:16 → 23:27	Transit of Mimas on top of Saturn
27, 21:20	**Moon's first quarter**
28, 06:43	Moon's apogee (parallax = 54' 14.129")
28, 08:18 → 10:22	Eclipse of Mimas by Saturn
28, 08:31 → 10:46	Occultation of Mimas by Saturn
28, 08:55 → 10:59	Occultation of Tethys by Saturn
28, 08:59 → 09:45	Eclipse of Tethys by Saturn
29, 05:54 → 07:34	Eclipse of Enceladus by Saturn
29, 06:06 → 08:15	Occultation of Enceladus by Saturn
29, 06:54 → 08:59	Eclipse of Mimas by Saturn
29, 07:08 → 09:23	Occultation of Mimas by Saturn
29, 07:35 → 09:39	Transit of Tethys on top of Saturn
29, 07:38 → 08:25	Shadow transit of Tethys on top of Saturn
29, 13:46	Conjunction Moon-η Leo
29, 15:56 → 18:25	Shadow transit of Europa on top of Jupiter
29, 16:33 → 19:05	Transit of Europa on top of Jupiter
29, 19:04 → 21:19	Shadow transit of Io on top of Jupiter
29, 19:22 → 21:38	Transit of Io on top of Jupiter
29, 21:38	Conjunction Moon-α Leo
30, 05:31 → 07:36	Eclipse of Mimas by Saturn
30, 05:45 → 08:00	Occultation of Mimas by Saturn
30, 06:14 → 08:18	Occultation of Tethys by Saturn

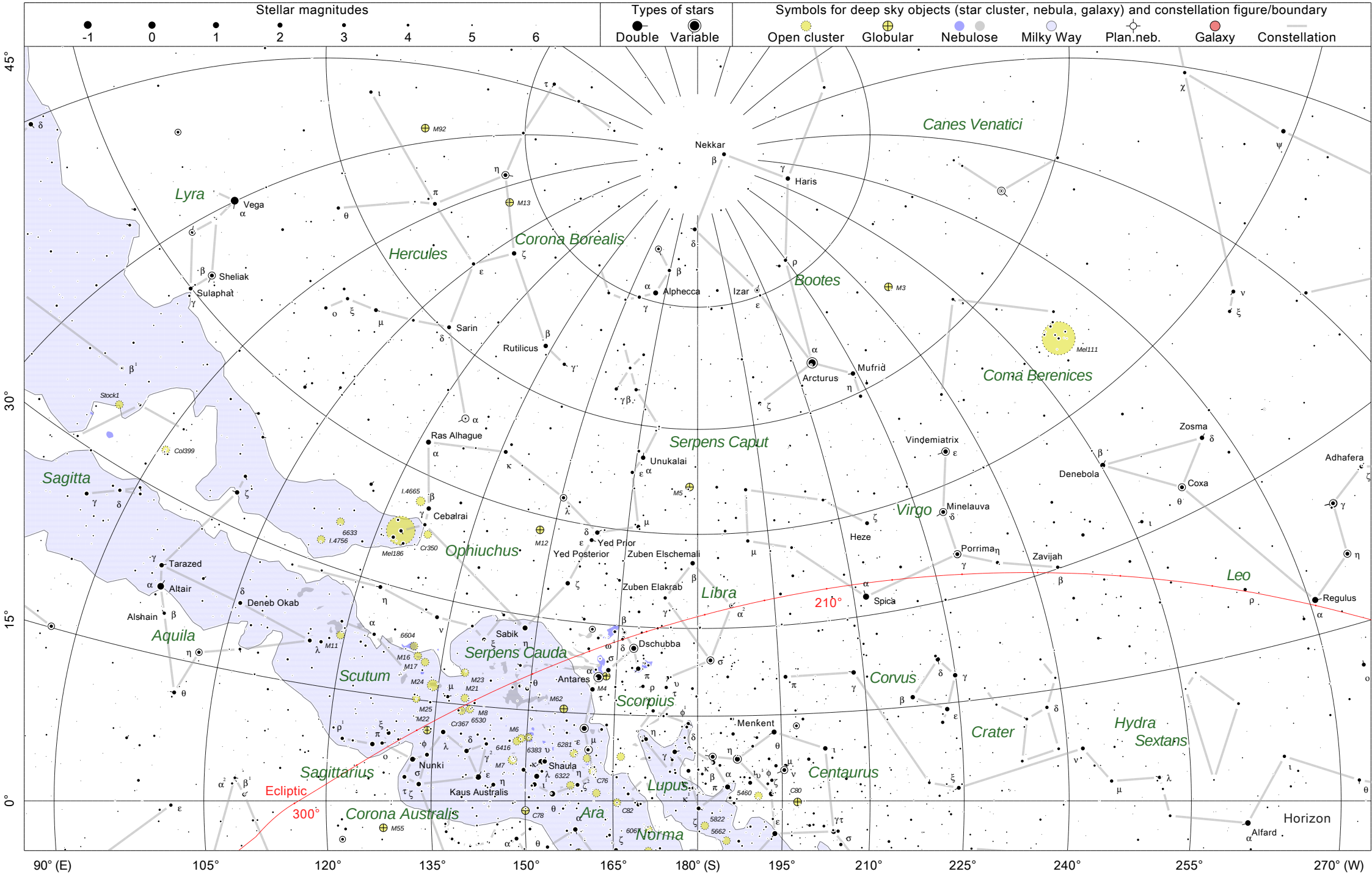
Sky on April 15, 2023, 00:00 h (UT)



Astronomical events for May

Date (UT)	Event description
1, 04:08 → 06:13	Eclipse of Mimas by Saturn
1, 04:22 → 06:37	Occultation of Mimas by Saturn
1, 04:53 → 06:58	Transit of Tethys on top of Saturn
1, 04:55 → 05:44	Shadow transit of Tethys on top of Saturn
1, 10:48 → 13:15	Eclipse of Europa by Jupiter
1, 11:27 → 13:57	Occultation of Europa by Jupiter
1, 13:33 → 15:47	Shadow transit of Io on top of Jupiter
1, 13:53 → 16:08	Transit of Io on top of Jupiter
2, 01:16	Minimum elongation of Mercury (0.692°)
2, 02:45 → 04:50	Eclipse of Mimas by Saturn
2, 02:59 → 05:14	Occultation of Mimas by Saturn
2, 03:32 → 05:38	Occultation of Tethys by Saturn
2, 03:34 → 04:24	Eclipse of Tethys by Saturn
2, 03:48 → 04:50	Transit of Dione on top of Saturn
2, 14:10 → 16:12	Shadow transit of Mimas on top of Saturn
2, 14:23 → 16:34	Transit of Mimas on top of Saturn
2, 14:30	Conjunction Moon-η Vir
2, 16:10 → 17:50	Shadow transit of Enceladus on top of Saturn
2, 16:22 → 18:32	Transit of Enceladus on top of Saturn
3, 01:22 → 03:27	Eclipse of Mimas by Saturn
3, 01:36 → 03:51	Occultation of Mimas by Saturn
3, 02:12 → 04:18	Transit of Tethys on top of Saturn
3, 02:13 → 03:04	Shadow transit of Tethys on top of Saturn
3, 05:15 → 07:43	Shadow transit of Europa on top of Jupiter
3, 06:00 → 08:31	Transit of Europa on top of Jupiter
3, 07:08	Minimum of eclipsing binary β Lyr
3, 08:01 → 10:16	Shadow transit of Io on top of Jupiter
3, 08:23 → 10:38	Transit of Io on top of Jupiter
3, 12:37 → 13:44	Occultation of Dione by Saturn
3, 12:47 → 14:49	Shadow transit of Mimas on top of Saturn
3, 13:00 → 15:12	Transit of Mimas on top of Saturn
3, 23:59 → 4, 02:04	Eclipse of Mimas by Saturn
4, 00:13 → 02:29	Occultation of Mimas by Saturn
4, 00:51 → 02:58	Occultation of Tethys by Saturn
4, 00:51 → 01:44	Eclipse of Tethys by Saturn
4, 01:03 → 02:43	Shadow transit of Enceladus on top of Saturn
4, 01:15 → 03:26	Transit of Enceladus on top of Saturn
4, 04:50	Conjunction Moon-α Vir
4, 22:40 → 5, 00:41	Eclipse of Mimas by Saturn
4, 22:50 → 5, 01:06	Occultation of Mimas by Saturn
4, 23:30 → 5, 01:38	Transit of Tethys on top of Saturn
4, 23:31 → 5, 00:23	Shadow transit of Tethys on top of Saturn
5, 00:06 → 02:33	Eclipse of Europa by Jupiter
5, 00:52 → 03:22	Occultation of Europa by Jupiter
5, 02:30 → 04:44	Shadow transit of Io on top of Jupiter
5, 02:54 → 05:09	Transit of Io on top of Jupiter
5, 09:56 → 11:37	Shadow transit of Enceladus on top of Saturn
5, 10:01 → 12:04	Shadow transit of Mimas on top of Saturn
5, 10:09 → 12:20	Transit of Enceladus on top of Saturn
5, 10:15 → 12:26	Transit of Mimas on top of Saturn
5, 17:23	**Lunar eclipse (penumbral, mag 0.95)**
5, 17:34	Full Moon
5, 21:13 → 23:18	Eclipse of Mimas by Saturn
5, 21:27 → 23:43	Occultation of Mimas by Saturn
5, 22:09 → 23:03	Eclipse of Tethys by Saturn
5, 22:10 → 6, 00:17	Occultation of Tethys by Saturn
6, 14:39	Maximum of η-Aquariids
6, 18:35 → 21:03	Shadow transit of Europa on top of Jupiter
6, 18:49 → 20:30	Shadow transit of Enceladus on top of Saturn
6, 19:02 → 21:13	Transit of Enceladus on top of Saturn
6, 19:27 → 21:58	Transit of Europa on top of Jupiter
6, 19:50 → 21:55	Eclipse of Mimas by Saturn
6, 20:04 → 22:20	Occultation of Mimas by Saturn
6, 20:48 → 21:43	Shadow transit of Tethys on top of Saturn
6, 20:49 → 22:57	Transit of Tethys on top of Saturn
6, 20:58 → 23:13	Shadow transit of Io on top of Jupiter
6, 21:24 → 23:39	Transit of Io on top of Jupiter
7, 10:52	Conjunction Moon-σ Sco
7, 13:35	Conjunction Moon-α Sco
7, 18:27 → 20:32	Eclipse of Mimas by Saturn
7, 18:41 → 20:57	Occultation of Mimas by Saturn
7, 19:27 → 20:23	Eclipse of Tethys by Saturn
7, 19:28 → 21:37	Occultation of Tethys by Saturn
8, 03:42 → 05:23	Shadow transit of Enceladus on top of Saturn
8, 03:55 → 06:07	Transit of Enceladus on top of Saturn
8, 05:53 → 07:55	Shadow transit of Mimas on top of Saturn
8, 06:06 → 08:18	Transit of Mimas on top of Saturn
8, 09:26 → 11:50	Shadow transit of Ganymede on top of Jupiter
8, 11:15 → 13:46	Transit of Ganymede on top of Jupiter
8, 13:23 → 15:50	Eclipse of Europa by Jupiter
8, 14:17 → 16:46	Occultation of Europa by Jupiter
8, 15:27 → 17:41	Shadow transit of Io on top of Jupiter
8, 15:54 → 18:09	Transit of Io on top of Jupiter
8, 17:03 → 19:09	Eclipse of Mimas by Saturn
8, 17:18 → 19:34	Occultation of Mimas by Saturn
8, 18:06 → 19:02	Shadow transit of Tethys on top of Saturn
8, 18:07 → 20:17	Transit of Tethys on top of Saturn
8, 20:06 → 21:47	Eclipse of Enceladus by Saturn
8, 20:19 → 22:30	Occultation of Enceladus by Saturn
9, 04:39	Maximum of η-Lyrids
9, 09:01	Moon's minimum declination (-27.938°)
9, 15:40 → 17:46	Eclipse of Mimas by Saturn
9, 15:55 → 18:11	Occultation of Mimas by Saturn
9, 16:45 → 17:42	Eclipse of Tethys by Saturn
9, 16:47 → 18:56	Occultation of Tethys by Saturn
9, 19:57	Conjunction of Uranus (elongation 0.313°)
9, 23:56	Conjunction Moon-τ Sgr
10, 03:07 → 05:10	Shadow transit of Mimas on top of Saturn
10, 03:21 → 05:33	Transit of Mimas on top of Saturn
10, 04:59 → 06:41	Eclipse of Enceladus by Saturn
10, 05:12 → 07:23	Occultation of Enceladus by Saturn
10, 07:53 → 10:21	Shadow transit of Europa on top of Jupiter
10, 08:53 → 11:23	Transit of Europa on top of Jupiter
10, 09:55 → 12:10	Shadow transit of Io on top of Jupiter
10, 10:25 → 12:40	Transit of Io on top of Jupiter
10, 14:17 → 16:23	Eclipse of Mimas by Saturn
10, 14:32 → 16:48	Occultation of Mimas by Saturn
10, 15:24 → 16:22	Shadow transit of Tethys on top of Saturn
10, 15:26 → 17:36	Transit of Tethys on top of Saturn
11, 04:57	Moon's perigee (parallax = 59' 21.050")
11, 12:54 → 15:00	Eclipse of Mimas by Saturn
11, 13:09 → 15:25	Occultation of Mimas by Saturn
11, 13:52 → 15:34	Eclipse of Enceladus by Saturn
11, 14:02 → 15:01	Eclipse of Tethys by Saturn
11, 14:05 → 16:17	Occultation of Enceladus by Saturn
11, 14:05 → 16:16	Occultation of Tethys by Saturn
11, 23:14 → 12, 01:38	Eclipse of Ganymede by Jupiter
12, 01:18 → 03:48	Occultation of Ganymede by Jupiter
12, 02:41 → 05:08	Eclipse of Europa by Jupiter
12, 03:42 → 06:11	Occultation of Europa by Jupiter
12, 04:24 → 06:38	Shadow transit of Io on top of Jupiter
12, 04:55 → 07:10	Transit of Io on top of Jupiter
12, 11:31 → 13:37	Eclipse of Mimas by Saturn
12, 11:46 → 14:02	Occultation of Mimas by Saturn
12, 12:42 → 13:41	Shadow transit of Tethys on top of Saturn
12, 12:44 → 14:55	Transit of Tethys on top of Saturn
12, 14:28	**Moon's last quarter**
12, 15:58	Lunar Transient Phenomena Lunar-X
12, 22:45 → 13, 00:27	Eclipse of Enceladus by Saturn
12, 22:58 → 13, 01:10	Occultation of Enceladus by Saturn
12, 22:59 → 13, 01:01	Shadow transit of Mimas on top of Saturn
12, 23:13 → 13, 01:25	Transit of Mimas on top of Saturn
13, 10:08 → 12:14	Eclipse of Mimas by Saturn
13, 10:23 → 12:39	Occultation of Mimas by Saturn
13, 11:20 → 12:21	Eclipse of Tethys by Saturn
13, 11:24 → 13:35	Occultation of Tethys by Saturn
13, 16:26	Conjunction Moon-Saturn
13, 21:13 → 23:41	Shadow transit of Europa on top of Jupiter
13, 22:19 → 14, 00:50	Transit of Europa on top of Jupiter
13, 22:53 → 14, 01:07	Shadow transit of Io on top of Jupiter
13, 23:25 → 14, 01:40	Transit of Io on top of Jupiter
14, 07:38 → 09:20	Eclipse of Enceladus by Saturn
14, 07:51 → 10:04	Occultation of Enceladus by Saturn
14, 08:45 → 10:50	Eclipse of Mimas by Saturn
14, 09:00 → 11:16	Occultation of Mimas by Saturn
14, 09:59 → 11:00	Shadow transit of Tethys on top of Saturn
14, 10:03 → 12:15	Transit of Tethys on top of Saturn
14, 11:19 → 12:43	Occultation of Dione by Saturn
15, 02:22	Conjunction Moon-Neptune
15, 07:22 → 09:27	Eclipse of Mimas by Saturn
15, 07:37 → 09:53	Occultation of Mimas by Saturn
15, 08:38 → 09:40	Eclipse of Tethys by Saturn
15, 08:42 → 10:54	Occultation of Tethys by Saturn
15, 13:27 → 15:51	Shadow transit of Ganymede on top of Jupiter
15, 15:47 → 18:14	Transit of Ganymede on top of Jupiter
15, 15:58 → 18:25	Eclipse of Europa by Jupiter
15, 16:31 → 18:14	Eclipse of Enceladus by Saturn
15, 16:45 → 18:57	Occultation of Enceladus by Saturn
15, 17:06 → 19:35	Occultation of Europa by Jupiter
15, 17:21 → 19:35	Shadow transit of Io on top of Jupiter
15, 17:55 → 20:10	Transit of Io on top of Jupiter
15, 18:50 → 20:53	Shadow transit of Mimas on top of Saturn
15, 19:04 → 21:17	Transit of Mimas on top of Saturn
15, 20:09 → 21:33	Transit of Dione on top of Saturn
16, 05:43	Minimum of eclipsing binary β Lyr
16, 05:59 → 08:04	Eclipse of Mimas by Saturn
16, 06:14 → 08:30	Occultation of Mimas by Saturn
16, 07:17 → 08:20	Shadow transit of Tethys on top of Saturn
16, 07:21 → 09:34	Transit of Tethys on top of Saturn
16, 09:00 → 10:43	Shadow transit of Enceladus on top of Saturn
16, 09:14 → 11:27	Transit of Enceladus on top of Saturn
17, 01:52	Conjunction Venus-ϵ Gem
17, 04:36 → 06:41	Eclipse of Mimas by Saturn
17, 04:51 → 07:07	Occultation of Mimas by Saturn
17, 04:59 → 06:27	Occultation of Dione by Saturn
17, 05:56 → 07:00	Eclipse of Tethys by Saturn
17, 06:01 → 08:13	Occultation of Tethys by Saturn
17, 10:31 → 12:59	Shadow transit of Europa on top of Jupiter
17, 11:45 → 14:15	Transit of Europa on top of Jupiter
17, 11:50 → 14:04	Shadow transit of Io on top of Jupiter
17, 12:26 → 14:41	Transit of Io on top of Jupiter
17, 13:58	Conjunction Moon-Jupiter
17, 16:04 → 18:07	Shadow transit of Mimas on top of Saturn
17, 16:19 → 18:31	Transit of Mimas on top of Saturn
17, 17:53 → 19:36	Shadow transit of Enceladus on top of Saturn
17, 18:07 → 20:21	Transit of Enceladus on top of Saturn
17, 23:37	Conjunction Moon-Mercury
18, 03:13 → 05:18	Eclipse of Mimas by Saturn
18, 03:28 → 05:44	Occultation of Mimas by Saturn
18, 04:35 → 05:39	Shadow transit of Tethys on top of Saturn
18, 04:40 → 06:53	Transit of Tethys on top of Saturn
18, 13:50 → 15:17	Transit of Dione on top of Saturn
18, 14:42 → 16:45	Shadow transit of Mimas on top of Saturn
18, 14:56 → 17:09	Transit of Mimas on top of Saturn
18, 23:48	Conjunction Moon-Uranus
19, 01:50 → 03:55	Eclipse of Mimas by Saturn
19, 02:05 → 04:21	Occultation of Mimas by Saturn
19, 02:46 → 04:29	Shadow transit of Enceladus on top of Saturn
19, 03:00 → 05:14	Transit of Enceladus on top of Saturn
19, 03:14 → 04:19	Eclipse of Tethys by Saturn
19, 03:16 → 05:39	Eclipse of Ganymede by Jupiter
19, 03:19 → 05:32	Occultation of Tethys by Saturn
19, 05:16 → 07:42	Eclipse of Europa by Jupiter
19, 05:50 → 08:16	Occultation of Ganymede by Jupiter
19, 06:18 → 08:33	Shadow transit of Io on top of Jupiter
19, 06:31 → 08:59	Occultation of Europa by Jupiter
19, 06:56 → 09:11	Transit of Io on top of Jupiter
19, 15:53	**New Moon**
20, 00:27 → 02:32	Eclipse of Mimas by Saturn
20, 00:42 → 02:58	Occultation of Mimas by Saturn
20, 01:53 → 02:58	Shadow transit of Tethys on top of Saturn
20, 01:58 → 04:12	Transit of Tethys on top of Saturn
20, 11:39 → 13:23	Shadow transit of Enceladus on top of Saturn
20, 11:53 → 14:07	Transit of Enceladus on top of Saturn
20, 11:56 → 13:59	Shadow transit of Mimas on top of Saturn
20, 12:10 → 14:23	Transit of Mimas on top of Saturn
20, 23:04 → 21, 01:09	Eclipse of Mimas by Saturn
20, 23:19 → 21, 01:35	Occultation of Mimas by Saturn
20, 23:51 → 21, 02:18	Shadow transit of Europa on top of Jupiter
21, 00:31 → 01:38	Eclipse of Tethys by Saturn
21, 00:37 → 02:52	Occultation of Tethys by Saturn
21, 00:47 → 03:01	Shadow transit of Io on top of Jupiter
21, 01:12 → 03:41	Transit of Europa on top of Jupiter
21, 01:26 → 03:41	Transit of Io on top of Jupiter
21, 20:32 → 22:16	Shadow transit of Enceladus on top of Saturn

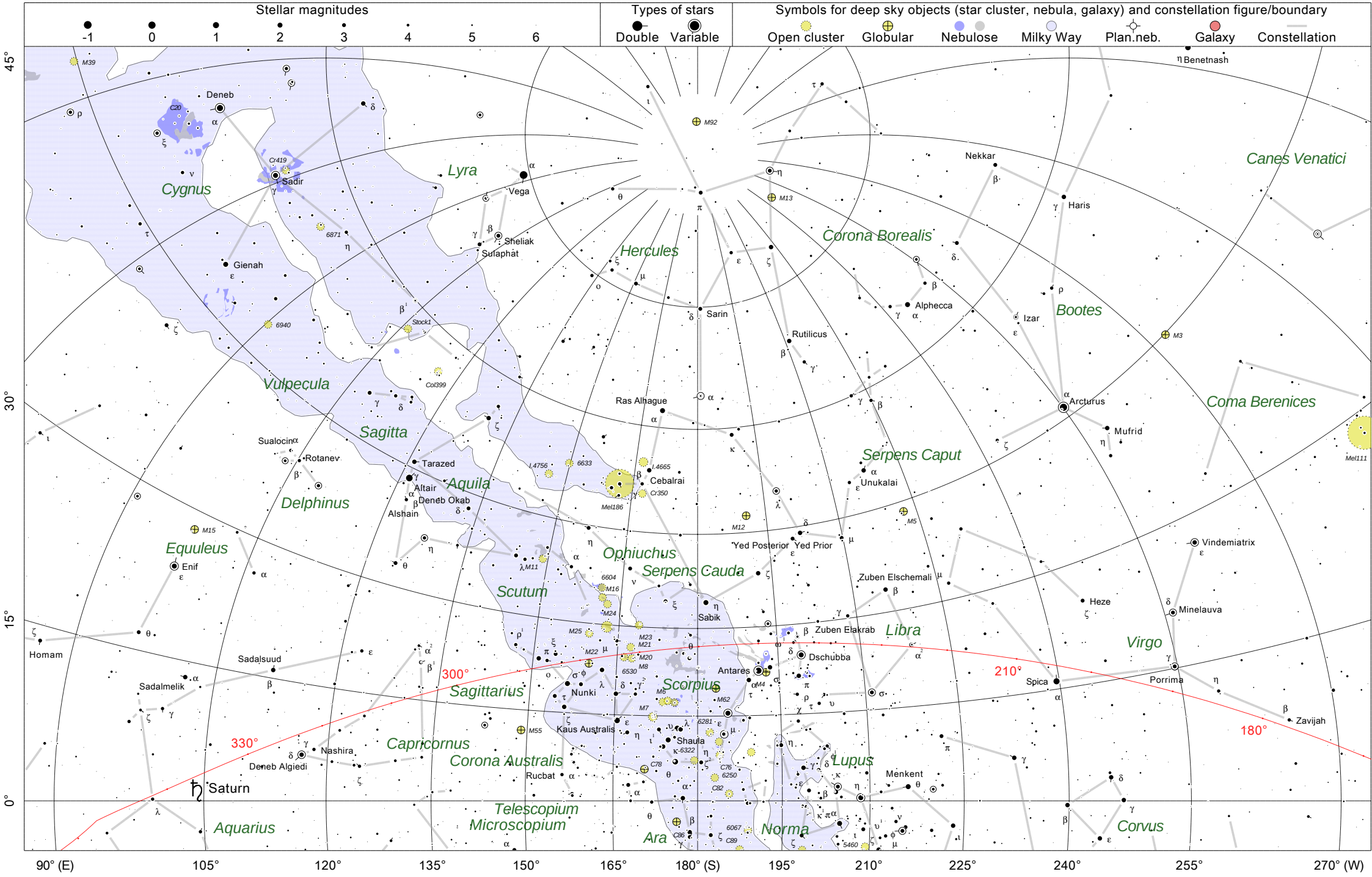
Sky on May 15, 2023, 00:00 h (UT)



Astronomical events for June

Date (UT)	Event description
1, 06:14 → 07:51	Transit of Dione on top of Saturn
1, 06:27 → 08:33	Eclipse of Mimas by Saturn
1, 06:43 → 08:59	Occultation of Mimas by Saturn
1, 08:19 → 09:34	Eclipse of Tethys by Saturn
1, 08:28 → 10:45	Occultation of Tethys by Saturn
1, 17:59 → 20:02	Shadow transit of Mimas on top of Saturn
1, 18:14 → 20:27	Transit of Mimas on top of Saturn
1, 19:36 → 21:22	Shadow transit of Enceladus on top of Saturn
1, 19:51 → 22:06	Transit of Enceladus on top of Saturn
2, 05:04 → 07:09	Eclipse of Mimas by Saturn
2, 05:20 → 07:36	Occultation of Mimas by Saturn
2, 06:58 → 08:13	Shadow transit of Tethys on top of Saturn
2, 07:07 → 09:24	Transit of Tethys on top of Saturn
2, 10:06 → 12:20	Shadow transit of Io on top of Jupiter
2, 10:25 → 12:51	Eclipse of Europa by Jupiter
2, 10:57 → 13:11	Transit of Io on top of Jupiter
2, 11:20 → 13:41	Eclipse of Ganymede by Jupiter
2, 12:06 → 14:33	Occultation of Europa by Jupiter
2, 15:05 → 16:43	Occultation of Dione by Saturn
2, 16:36 → 18:39	Shadow transit of Mimas on top of Saturn
2, 16:51 → 19:04	Transit of Mimas on top of Saturn
3, 03:41 → 05:46	Eclipse of Mimas by Saturn
3, 03:56 → 06:13	Occultation of Mimas by Saturn
3, 04:29 → 06:15	Shadow transit of Enceladus on top of Saturn
3, 04:44 → 06:59	Transit of Enceladus on top of Saturn
3, 05:37 → 06:53	Eclipse of Tethys by Saturn
3, 05:46 → 08:04	Occultation of Tethys by Saturn
3, 10:20	Conjunction Moon-δ Sco
3, 17:47	Conjunction Moon-σ Sco
3, 21:42	Conjunction Moon-α Sco
4, 02:18 → 04:23	Eclipse of Mimas by Saturn
4, 02:34 → 04:50	Occultation of Mimas by Saturn
4, 03:42	Full Moon
4, 04:16 → 05:32	Shadow transit of Tethys on top of Saturn
4, 04:25 → 06:43	Transit of Tethys on top of Saturn
4, 04:35 → 06:49	Shadow transit of Io on top of Jupiter
4, 05:06 → 07:34	Shadow transit of Europa on top of Jupiter
4, 05:27 → 07:41	Transit of Io on top of Jupiter
4, 06:54 → 09:22	Transit of Europa on top of Jupiter
4, 10:51	Maximum elongation of Venus (45.399° E)
4, 13:22 → 15:08	Shadow transit of Enceladus on top of Saturn
4, 13:37 → 15:53	Transit of Enceladus on top of Saturn
4, 13:50 → 15:54	Shadow transit of Mimas on top of Saturn
4, 14:05 → 16:18	Transit of Mimas on top of Saturn
5, 00:32	Conjunction Mercury-Uranus
5, 00:55 → 03:00	Eclipse of Mimas by Saturn
5, 01:10 → 03:27	Occultation of Mimas by Saturn
5, 02:55 → 04:12	Eclipse of Tethys by Saturn
5, 03:05 → 05:22	Occultation of Tethys by Saturn
5, 10:06 → 10:24	NGC6520 behind Moon
5, 16:21	Moon's minimum declination (-27.868°)
5, 22:15 → 6, 00:02	Shadow transit of Enceladus on top of Saturn
5, 22:30 → 6, 00:46	Transit of Enceladus on top of Saturn
5, 23:03 → 6, 01:17	Shadow transit of Io on top of Jupiter
5, 23:32 → 6, 01:37	Eclipse of Mimas by Saturn
5, 23:42 → 6, 02:09	Eclipse of Europa by Jupiter
5, 23:47 → 6, 02:03	Occultation of Mimas by Saturn
5, 23:57 → 6, 02:11	Transit of Io on top of Jupiter
6, 01:30 → 03:56	Occultation of Europa by Jupiter
6, 01:30 → 03:50	Shadow transit of Ganymede on top of Jupiter
6, 01:34 → 02:52	Shadow transit of Tethys on top of Saturn
6, 01:44 → 04:02	Transit of Tethys on top of Saturn
6, 09:25 → 10:00	τ Sgr behind Moon
6, 22:09 → 7, 00:14	Eclipse of Mimas by Saturn
6, 22:24 → 7, 00:40	Occultation of Mimas by Saturn
6, 23:07	Moon's perigee (parallax = 1° 0' 5.983")
7, 00:13 → 01:31	Eclipse of Tethys by Saturn
7, 00:23 → 02:41	Occultation of Tethys by Saturn
7, 17:32 → 19:46	Shadow transit of Io on top of Jupiter
7, 18:25 → 20:52	Shadow transit of Europa on top of Jupiter
7, 18:27 → 20:41	Transit of Io on top of Jupiter
7, 20:19 → 22:47	Transit of Europa on top of Jupiter
7, 20:46 → 22:51	Eclipse of Mimas by Saturn
7, 21:01 → 23:17	Occultation of Mimas by Saturn
7, 22:29	Maximum of Dayt. Arietids
7, 22:52 → 8, 00:11	Shadow transit of Tethys on top of Saturn
7, 23:02 → 8, 01:20	Transit of Tethys on top of Saturn
7, 23:32 → 8, 01:20	Eclipse of Enceladus by Saturn
7, 23:47 → 8, 02:02	Occultation of Enceladus by Saturn
8, 19:23 → 21:28	Eclipse of Mimas by Saturn
8, 19:38 → 21:54	Occultation of Mimas by Saturn
8, 21:31 → 22:50	Eclipse of Tethys by Saturn
8, 21:41 → 23:59	Occultation of Tethys by Saturn
9, 06:56 → 08:59	Shadow transit of Mimas on top of Saturn
9, 07:11 → 09:24	Transit of Mimas on top of Saturn
9, 08:25 → 10:13	Eclipse of Enceladus by Saturn
9, 08:40 → 10:55	Occultation of Enceladus by Saturn
9, 12:00 → 14:14	Shadow transit of Io on top of Jupiter
9, 12:57 → 15:11	Transit of Io on top of Jupiter
9, 13:00 → 15:26	Eclipse of Europa by Jupiter
9, 14:53 → 17:19	Occultation of Europa by Jupiter
9, 15:21 → 17:41	Eclipse of Ganymede by Jupiter
9, 18:00 → 20:05	Eclipse of Mimas by Saturn
9, 18:15 → 20:31	Occultation of Mimas by Saturn
9, 20:10 → 21:30	Shadow transit of Tethys on top of Saturn
9, 20:20 → 22:38	Transit of Tethys on top of Saturn
9, 21:14	Conjunction Moon-Saturn
10, 16:37 → 18:42	Eclipse of Mimas by Saturn
10, 16:52 → 19:08	Occultation of Mimas by Saturn
10, 17:18 → 19:06	Eclipse of Enceladus by Saturn
10, 17:33 → 19:49	Occultation of Enceladus by Saturn
10, 18:49 → 20:09	Eclipse of Tethys by Saturn
10, 18:59 → 21:18	Occultation of Tethys by Saturn
10, 19:31	**Moon's last quarter**
10, 20:08 → 21:48	Occultation of Dione by Saturn
11, 02:41	Lunar Transient Phenomena Lunar-X
11, 02:52	Minimum of eclipsing binary β Lyr
11, 06:29 → 08:43	Shadow transit of Io on top of Jupiter
11, 07:27 → 09:41	Transit of Io on top of Jupiter
11, 07:44 → 10:11	Shadow transit of Europa on top of Jupiter
11, 09:44 → 12:12	Transit of Europa on top of Jupiter
11, 11:16	Conjunction Moon-Neptune
11, 15:14 → 17:19	Eclipse of Mimas by Saturn
11, 15:29 → 17:45	Occultation of Mimas by Saturn
11, 17:28 → 18:49	Shadow transit of Tethys on top of Saturn
11, 17:39 → 19:57	Transit of Tethys on top of Saturn
12, 02:11 → 04:00	Eclipse of Enceladus by Saturn
12, 02:26 → 04:42	Occultation of Enceladus by Saturn
12, 02:47 → 04:51	Shadow transit of Mimas on top of Saturn
12, 03:02 → 05:15	Transit of Mimas on top of Saturn
12, 04:58 → 06:37	Transit of Dione on top of Saturn
12, 13:51 → 15:56	Eclipse of Mimas by Saturn
12, 14:06 → 16:22	Occultation of Mimas by Saturn
12, 16:07 → 17:29	Eclipse of Tethys by Saturn
12, 16:18 → 18:36	Occultation of Tethys by Saturn
13, 00:57 → 03:11	Shadow transit of Io on top of Jupiter
13, 01:57 → 04:11	Transit of Io on top of Jupiter
13, 02:17 → 04:43	Eclipse of Europa by Jupiter
13, 04:16 → 06:42	Occultation of Europa by Jupiter
13, 05:32 → 07:51	Shadow transit of Ganymede on top of Jupiter
13, 11:05 → 12:53	Eclipse of Enceladus by Saturn
13, 11:20 → 13:35	Occultation of Enceladus by Saturn
13, 12:28 → 14:33	Eclipse of Mimas by Saturn
13, 12:43 → 14:58	Occultation of Mimas by Saturn
13, 13:49 → 15:29	Occultation of Dione by Saturn
13, 14:46 → 16:08	Shadow transit of Tethys on top of Saturn
13, 14:57 → 17:15	Transit of Tethys on top of Saturn
14, 04:34	Conjunction Moon-Jupiter
14, 11:05 → 13:10	Eclipse of Mimas by Saturn
14, 11:20 → 13:35	Occultation of Mimas by Saturn
14, 13:25 → 14:48	Eclipse of Tethys by Saturn
14, 13:36 → 15:54	Occultation of Tethys by Saturn
14, 19:25 → 21:40	Shadow transit of Io on top of Jupiter
14, 20:26 → 22:40	Transit of Io on top of Jupiter
14, 21:03 → 23:30	Shadow transit of Europa on top of Jupiter
14, 22:39 → 15, 00:42	Shadow transit of Mimas on top of Saturn
14, 22:39 → 15, 00:18	Transit of Dione on top of Saturn
14, 22:53 → 15, 01:06	Transit of Mimas on top of Saturn
14, 23:09 → 15, 01:35	Transit of Europa on top of Jupiter
15, 07:36	Conjunction Moon-Uranus
15, 09:42 → 11:47	Eclipse of Mimas by Saturn
15, 09:57 → 12:12	Occultation of Mimas by Saturn
15, 12:04 → 13:27	Shadow transit of Tethys on top of Saturn
15, 12:15 → 14:34	Transit of Tethys on top of Saturn
15, 12:26 → 14:14	Shadow transit of Enceladus on top of Saturn
15, 12:41 → 14:57	Transit of Enceladus on top of Saturn
16, 07:30 → 09:10	Occultation of Dione by Saturn
16, 08:19 → 10:24	Eclipse of Mimas by Saturn
16, 08:34 → 10:49	Occultation of Mimas by Saturn
16, 10:43 → 12:07	Eclipse of Tethys by Saturn
16, 10:54 → 13:13	Occultation of Tethys by Saturn
16, 13:54 → 16:08	Shadow transit of Io on top of Jupiter
16, 14:56 → 17:10	Transit of Io on top of Jupiter
16, 15:34 → 18:00	Eclipse of Europa by Jupiter
16, 17:39 → 20:04	Occultation of Europa by Jupiter
16, 19:21 → 21:41	Eclipse of Ganymede by Jupiter
16, 19:53 → 21:56	Shadow transit of Mimas on top of Saturn
16, 20:07 → 22:20	Transit of Mimas on top of Saturn
16, 20:49	Conjunction Moon-Mercury
16, 21:19 → 23:08	Shadow transit of Enceladus on top of Saturn
16, 21:34 → 23:49	Transit of Enceladus on top of Saturn
17, 00:47	Conjunction Mercury-α Tau
17, 06:56 → 09:01	Eclipse of Mimas by Saturn
17, 07:11 → 09:26	Occultation of Mimas by Saturn
17, 09:22 → 10:46	Shadow transit of Tethys on top of Saturn
17, 09:33 → 11:52	Transit of Tethys on top of Saturn
18, 04:37	**New Moon**
18, 05:33 → 07:38	Eclipse of Mimas by Saturn
18, 05:48 → 08:03	Occultation of Mimas by Saturn
18, 06:12 → 08:01	Shadow transit of Enceladus on top of Saturn
18, 06:27 → 08:42	Transit of Enceladus on top of Saturn
18, 08:01 → 09:26	Eclipse of Tethys by Saturn
18, 08:12 → 10:31	Occultation of Tethys by Saturn
18, 08:22 → 10:37	Shadow transit of Io on top of Jupiter
18, 09:26 → 11:40	Transit of Io on top of Jupiter
18, 10:22 → 12:49	Shadow transit of Europa on top of Jupiter
18, 12:33 → 15:00	Transit of Europa on top of Jupiter
18, 21:07	Moon's maximum declination (27.835°)
19, 04:46 → 05:28	NGC2266 behind Moon
19, 15:05 → 16:54	Shadow transit of Enceladus on top of Saturn
19, 15:20 → 17:35	Transit of Enceladus on top of Saturn
19, 15:44 → 17:48	Shadow transit of Mimas on top of Saturn
19, 15:59 → 18:11	Transit of Mimas on top of Saturn
20, 02:51 → 05:05	Shadow transit of Io on top of Jupiter
20, 03:56 → 06:10	Transit of Io on top of Jupiter
20, 04:52 → 07:18	Eclipse of Europa by Jupiter
20, 05:26 → 06:45	Eclipse of Tethys by Saturn
20, 05:30 → 07:49	Occultation of Tethys by Saturn
20, 07:01 → 09:27	Occultation of Europa by Jupiter
20, 07:30 → 09:19	Eclipse of Enceladus by Saturn
20, 07:44 → 09:59	Occultation of Enceladus by Saturn
20, 08:22	Conjunction Moon-β Gem
20, 23:58 → 21, 01:47	Shadow transit of Enceladus on top of Saturn
21, 00:13 → 02:28	Transit of Enceladus on top of Saturn
21, 01:24 → 03:29	Eclipse of Mimas by Saturn
21, 01:39 → 03:53	Occultation of Mimas by Saturn
21, 14:58	Summer solstice
21, 16:23 → 18:13	Eclipse of Enceladus by Saturn
21, 16:38 → 18:52	Occultation of Enceladus by Saturn
21, 18:52 → 20:31	Occultation of Dione by Saturn
21, 21:19 → 23:33	Shadow transit of Io on top of Jupiter
21, 22:25 → 22, 00:39	Transit of Io on top of Jupiter
21, 23:40 → 22, 02:07	Shadow transit of Europa on top of Jupiter
22, 01:57 → 04:23	Transit of Europa on top of Jupiter
22, 02:37	Conjunction Moon-Venus
22, 10:24	Conjunction Moon-Mars
22, 18:30	Moon's apogee (parallax = 54' 5.418")
23, 01:16 → 03:06	Eclipse of Enceladus by Saturn
23, 01:17 → 02:44	Shadow transit of Tethys on top of Saturn
23, 01:28 → 03:46	Transit of Tethys on top of Saturn
23, 01:30 → 03:45	Occultation of Enceladus by Saturn
23, 03:43 → 05:20	Transit of Dione on top of Saturn
23, 06:03	Conjunction Moon-η Leo
23, 08:36	Conjunction Moon-α Leo
23, 15:48 → 18:02	Shadow transit of Io on top of Jupiter

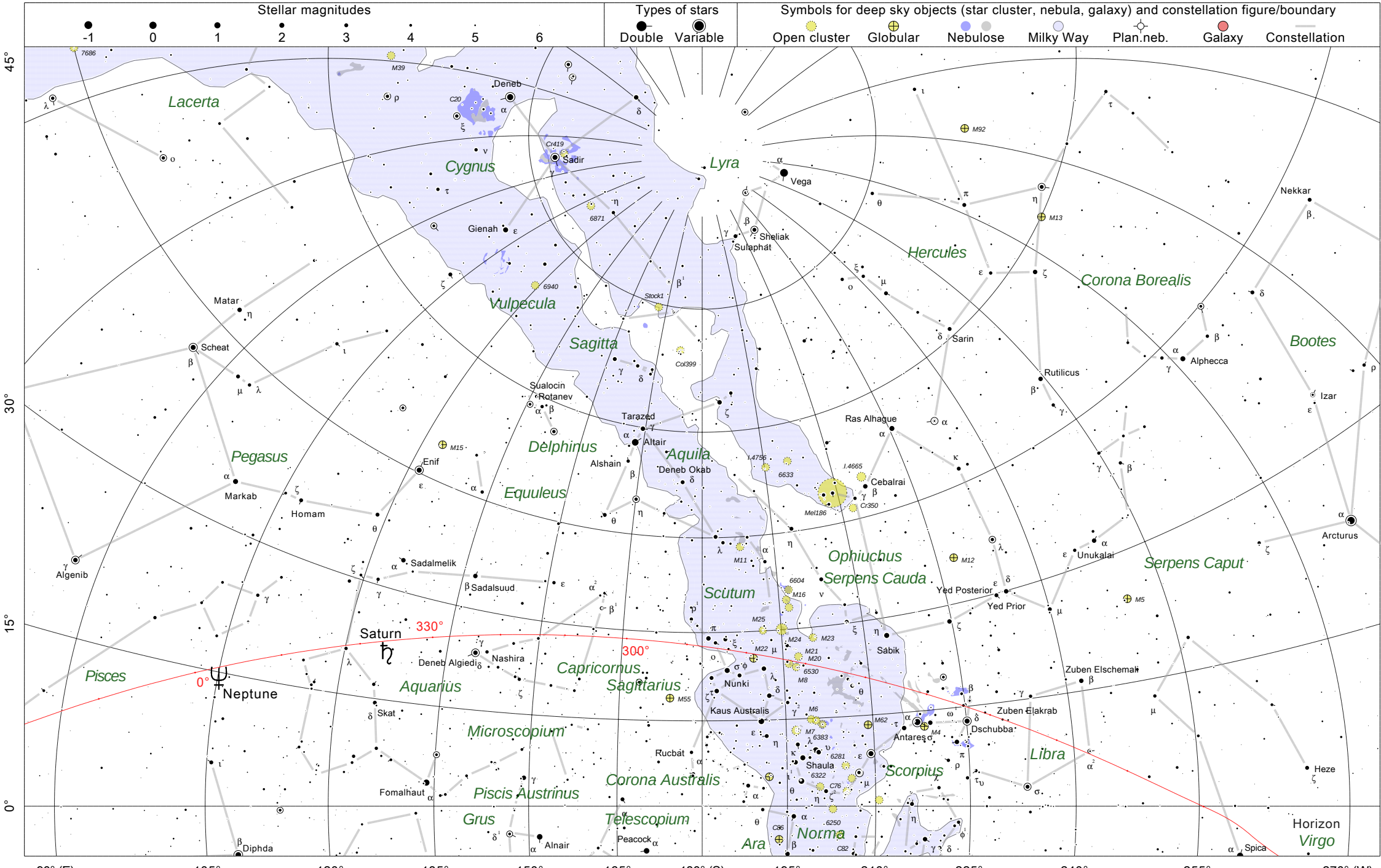
Sky on June 15, 2023, 00:00 h (UT)



Astronomical events for July

Date (UT)	Event description
30, 23:07 → 1, 01:32	Occultation of Europa by Jupiter
1, 02:39	Minimum elongation of Mercury (1.264°)
1, 05:54	Conjunction Moon-σ Sco
1, 06:34 → 08:26	Eclipse of Enceladus by Saturn
1, 06:48 → 09:02	Occultation of Enceladus by Saturn
1, 08:07	Conjunction Venus-Mars
1, 08:39	Conjunction Moon-α Sco
1, 08:46 → 10:19	Transit of Dione on top of Saturn
1, 10:12 → 12:15	Eclipse of Mimas by Saturn
1, 10:25 → 12:38	Occultation of Mimas by Saturn
1, 17:47	Conjunction Mercury-ϵ Gem
1, 19:07	Minimum of eclipsing binary β Per
1, 21:47 → 23:50	Shadow transit of Mimas on top of Saturn
1, 22:00 → 2, 00:11	Transit of Mimas on top of Saturn
1, 23:02 → 2, 00:54	Shadow transit of Enceladus on top of Saturn
1, 23:16 → 2, 01:30	Transit of Enceladus on top of Saturn
2, 04:40	Conjunction Venus-Mars
2, 15:27 → 17:19	Eclipse of Enceladus by Saturn
2, 15:41 → 17:55	Occultation of Enceladus by Saturn
2, 17:37 → 19:10	Occultation of Dione by Saturn
3, 01:23	Moon's minimum declination (-27.841°)
3, 07:26 → 09:29	Eclipse of Mimas by Saturn
3, 07:39 → 09:51	Occultation of Mimas by Saturn
3, 07:55 → 09:47	Shadow transit of Enceladus on top of Saturn
3, 08:09 → 10:23	Transit of Enceladus on top of Saturn
3, 10:51	Conjunction Moon-ϕ Sgr
3, 11:39	Full Moon
3, 16:32 → 17:00	τ Sgr behind Moon
4, 00:20 → 02:12	Eclipse of Enceladus by Saturn
4, 00:34 → 02:47	Occultation of Enceladus by Saturn
4, 02:27 → 03:58	Transit of Dione on top of Saturn
4, 06:38 → 08:53	Shadow transit of Io on top of Jupiter
4, 07:52 → 10:06	Transit of Io on top of Jupiter
4, 10:01 → 12:27	Eclipse of Europa by Jupiter
4, 15:56	Minimum of eclipsing binary β Per
4, 16:48 → 18:40	Shadow transit of Enceladus on top of Saturn
4, 17:02 → 19:16	Transit of Enceladus on top of Saturn
4, 17:38 → 19:41	Shadow transit of Mimas on top of Saturn
4, 17:51 → 20:02	Transit of Mimas on top of Saturn
4, 22:28	Moon's perigee (parallax = 1° 0' 54.091")
5, 07:44 → 09:18	Eclipse of Tethys by Saturn
5, 07:56 → 10:12	Occultation of Tethys by Saturn
5, 09:13 → 11:06	Eclipse of Enceladus by Saturn
5, 09:27 → 11:40	Occultation of Enceladus by Saturn
5, 11:18 → 12:49	Occultation of Dione by Saturn
6, 01:41 → 03:33	Shadow transit of Enceladus on top of Saturn
6, 01:54 → 04:08	Transit of Enceladus on top of Saturn
6, 03:17 → 05:21	Eclipse of Mimas by Saturn
6, 03:30 → 05:42	Occultation of Mimas by Saturn
6, 18:06 → 19:59	Eclipse of Enceladus by Saturn
6, 18:20 → 20:33	Occultation of Enceladus by Saturn
6, 20:08 → 21:37	Transit of Dione on top of Saturn
6, 20:09	Maximum distance of Sun (1.017 AU)
7, 00:02	Minimum of eclipsing binary β Lyr
7, 07:09	Conjunction Moon-Saturn
7, 12:45	Minimum of eclipsing binary β Per
7, 23:49	Conjunction Mercury-β Gem
8, 03:05 → 04:52	Eclipse of Enceladus by Saturn
8, 03:12 → 05:26	Occultation of Enceladus by Saturn
8, 03:42 → 05:17	Shadow transit of Tethys on top of Saturn
8, 03:53 → 06:09	Transit of Tethys on top of Saturn
8, 04:59 → 06:28	Occultation of Dione by Saturn
8, 15:58	Conjunction Moon-Neptune
9, 10:44 → 12:47	Shadow transit of Mimas on top of Saturn
9, 10:56 → 13:06	Transit of Mimas on top of Saturn
9, 11:53 → 13:46	Eclipse of Enceladus by Saturn
9, 12:05 → 14:18	Occultation of Enceladus by Saturn
9, 13:13	Minimum of eclipsing binary λ Tau
9, 13:50 → 15:16	Transit of Dione on top of Saturn
10, 01:48	**Moon's last quarter**
10, 09:34	Minimum of eclipsing binary β Per
10, 13:17	Lunar Transient Phenomena Lunar-X
10, 18:07	Conjunction Mars-α Leo
10, 20:23 → 22:26	Eclipse of Mimas by Saturn
10, 20:34 → 22:45	Occultation of Mimas by Saturn
10, 20:46 → 22:39	Eclipse of Enceladus by Saturn
10, 20:58 → 23:11	Occultation of Enceladus by Saturn
10, 22:41 → 11, 00:07	Occultation of Dione by Saturn
10, 23:39 → 11, 01:15	Eclipse of Tethys by Saturn
10, 23:50 → 11, 02:05	Occultation of Tethys by Saturn
11, 20:16	Conjunction Moon-Jupiter
12, 05:39 → 07:32	Eclipse of Enceladus by Saturn
12, 05:51 → 08:04	Occultation of Enceladus by Saturn
12, 06:35 → 08:38	Shadow transit of Mimas on top of Saturn
12, 06:47 → 08:57	Transit of Mimas on top of Saturn
12, 07:31 → 08:54	Transit of Dione on top of Saturn
12, 17:56	Conjunction Moon-Uranus
12, 20:57 → 22:34	Eclipse of Tethys by Saturn
12, 21:08 → 23:23	Occultation of Tethys by Saturn
12, 22:06 → 13, 24:00	Shadow transit of Enceladus on top of Saturn
12, 22:19 → 13, 00:31	Transit of Enceladus on top of Saturn
13, 06:23	Minimum of eclipsing binary β Per
13, 12:05	Minimum of eclipsing binary λ Tau
13, 14:32 → 16:26	Eclipse of Enceladus by Saturn
13, 14:44 → 16:56	Occultation of Enceladus by Saturn
13, 16:14 → 18:17	Eclipse of Mimas by Saturn
13, 16:22 → 17:45	Occultation of Dione by Saturn
13, 16:25 → 18:36	Occultation of Mimas by Saturn
14, 23:25 → 15, 01:19	Eclipse of Enceladus by Saturn
14, 23:37 → 15, 01:49	Occultation of Enceladus by Saturn
15, 01:13 → 02:33	Transit of Dione on top of Saturn
15, 02:27 → 04:29	Shadow transit of Mimas on top of Saturn
15, 02:38 → 04:47	Transit of Mimas on top of Saturn
15, 15:59 → 17:46	Shadow transit of Enceladus on top of Saturn
15, 16:04 → 18:16	Transit of Enceladus on top of Saturn
15, 16:55 → 18:33	Shadow transit of Tethys on top of Saturn
15, 16:58 → 18:53	Occultation of Ganymede by Jupiter
15, 17:05 → 19:19	Transit of Tethys on top of Saturn
15, 18:47 → 21:02	Eclipse of Io by Jupiter
15, 20:07 → 22:21	Occultation of Io by Jupiter
16, 02:41	Moon's maximum declination (27.849°)
16, 03:12	Minimum of eclipsing binary β Per
16, 08:18 → 10:12	Eclipse of Enceladus by Saturn
16, 08:30 → 10:41	Occultation of Enceladus by Saturn
16, 10:03 → 11:23	Occultation of Dione by Saturn
16, 10:46	Conjunction Venus-α Leo
16, 23:41 → 17, 01:43	Shadow transit of Mimas on top of Saturn
16, 23:51 → 17, 02:01	Transit of Mimas on top of Saturn
17, 00:46 → 02:40	Shadow transit of Enceladus on top of Saturn
17, 00:57 → 03:09	Transit of Enceladus on top of Saturn
17, 04:09	Conjunction Venus-α Leo
17, 10:57	Minimum of eclipsing binary λ Tau
17, 15:53	Conjunction Moon-β Gem
17, 17:11 → 19:06	Eclipse of Enceladus by Saturn
17, 17:22 → 19:34	Occultation of Enceladus by Saturn
17, 18:32	**New Moon**
17, 18:54 → 20:10	Transit of Dione on top of Saturn
18, 09:20 → 11:22	Eclipse of Mimas by Saturn
18, 09:30 → 11:39	Occultation of Mimas by Saturn
18, 09:39 → 11:33	Shadow transit of Enceladus on top of Saturn
18, 09:50 → 12:02	Transit of Enceladus on top of Saturn
18, 23:59	New Islamic
19, 00:01	Minimum of eclipsing binary β Per
19, 02:04 → 03:59	Eclipse of Enceladus by Saturn
19, 02:15 → 04:27	Occultation of Enceladus by Saturn
19, 03:45 → 05:01	Occultation of Dione by Saturn
19, 07:13 → 09:05	Transit of Ganymede on top of Jupiter
19, 07:44 → 09:59	Eclipse of Io by Jupiter
19, 08:49	Conjunction Moon-Mercury
19, 09:06 → 11:20	Occultation of Io by Jupiter
19, 18:32 → 20:26	Shadow transit of Enceladus on top of Saturn
19, 18:43 → 20:54	Transit of Enceladus on top of Saturn
19, 19:32 → 21:35	Shadow transit of Mimas on top of Saturn
19, 19:42 → 21:51	Transit of Mimas on top of Saturn
19, 22:36	Minimum of eclipsing binary β Lyr
20, 06:56	Moon's apogee (parallax = 53' 58.184")
20, 10:10 → 11:51	Eclipse of Tethys by Saturn
20, 10:20 → 12:32	Occultation of Tethys by Saturn
20, 10:58 → 12:52	Eclipse of Enceladus by Saturn
20, 11:08 → 13:19	Occultation of Enceladus by Saturn
20, 12:27	Conjunction Moon-η Leo
20, 12:36 → 13:48	Transit of Dione on top of Saturn
20, 19:30	Conjunction Moon-α Leo
21, 03:25 → 05:20	Shadow transit of Enceladus on top of Saturn
21, 03:35 → 05:47	Transit of Enceladus on top of Saturn
21, 04:55	Conjunction Moon-Mars
21, 05:11 → 07:13	Eclipse of Mimas by Saturn
21, 05:21 → 07:30	Occultation of Mimas by Saturn
21, 09:12 → 10:10	NGC3368 (M96) behind Moon
21, 09:49	Minimum of eclipsing binary λ Tau
21, 11:29	Conjunction Mars-ρ Leo
21, 19:51 → 21:46	Eclipse of Enceladus by Saturn
21, 20:01 → 22:12	Occultation of Enceladus by Saturn
21, 20:50	Minimum of eclipsing binary β Per
21, 21:27 → 22:39	Occultation of Dione by Saturn
21, 23:59	New Armenian year
22, 20:41 → 22:56	Eclipse of Io by Jupiter
22, 21:10 → 23:02	Occultation of Ganymede by Jupiter
22, 22:04 → 23, 00:18	Occultation of Io by Jupiter
23, 04:53 → 06:39	Eclipse of Enceladus by Saturn
23, 04:54 → 07:04	Occultation of Enceladus by Saturn
23, 06:08 → 07:49	Shadow transit of Tethys on top of Saturn
23, 06:17 → 08:28	Transit of Tethys on top of Saturn
23, 06:18 → 07:25	Transit of Dione on top of Saturn
23, 15:22 → 15:49	η Vir behind Moon
24, 12:38 → 14:40	Shadow transit of Mimas on top of Saturn
24, 12:47 → 14:55	Transit of Mimas on top of Saturn
24, 13:37 → 15:32	Eclipse of Enceladus by Saturn
24, 13:47 → 15:57	Occultation of Enceladus by Saturn
24, 15:09 → 16:16	Occultation of Dione by Saturn
24, 17:39	Minimum of eclipsing binary β Per
25, 05:17	Conjunction Moon-α Vir
25, 06:53	Lunar Transient Phenomena Lunar-X
25, 08:42	Minimum of eclipsing binary λ Tau
25, 22:07	**Moon's first quarter**
25, 22:17 → 26, 00:19	Eclipse of Mimas by Saturn
25, 22:25 → 26, 00:33	Occultation of Mimas by Saturn
25, 22:30 → 26, 00:26	Eclipse of Enceladus by Saturn
25, 22:40 → 26, 00:49	Occultation of Enceladus by Saturn
26, 24:00 → 01:02	Transit of Dione on top of Saturn
26, 09:38 → 11:53	Eclipse of Io by Jupiter
26, 11:02 → 13:15	Occultation of Io by Jupiter
26, 11:23 → 13:11	Transit of Ganymede on top of Jupiter
27, 07:23 → 09:19	Eclipse of Enceladus by Saturn
27, 07:32 → 09:42	Occultation of Enceladus by Saturn
27, 08:29 → 10:31	Shadow transit of Mimas on top of Saturn
27, 08:37 → 10:45	Transit of Mimas on top of Saturn
27, 08:51 → 09:52	Occultation of Dione by Saturn
27, 14:28	Minimum of eclipsing binary β Per
27, 23:23 → 28, 01:07	Eclipse of Tethys by Saturn
27, 23:32 → 28, 01:42	Occultation of Tethys by Saturn
27, 23:50 → 28, 01:46	Shadow transit of Enceladus on top of Saturn
27, 23:59 → 28, 02:09	Transit of Enceladus on top of Saturn
28, 13:28	Conjunction Moon-σ Sco
28, 15:31	Maximum of Piscis Austr.
28, 16:16 → 18:12	Eclipse of Enceladus by Saturn
28, 16:25 → 18:34	Occultation of Enceladus by Saturn
28, 17:15	Conjunction Moon-α Sco
28, 17:43 → 18:38	Transit of Dione on top of Saturn
28, 18:08 → 20:10	Eclipse of Mimas by Saturn
28, 18:16 → 20:23	Occultation of Mimas by Saturn
28, 23:55	Conjunction Mercury-α Leo
29, 07:34	Minimum of eclipsing binary λ Tau
29, 22:35 → 30, 00:50	Eclipse of Io by Jupiter
30, 24:00 → 02:13	Occultation of Io by Jupiter
30, 01:10 → 03:06	Eclipse of Enceladus by Saturn
30, 01:18 → 03:27	Occultation of Enceladus by Saturn
30, 01:18 → 03:05	Occultation of Ganymede by Jupiter
30, 02:34 → 03:28	Occultation of Dione by Saturn
30, 11:13	Moon's minimum declination (-27.924°)
30, 11:17	Minimum of eclipsing binary β Per
30, 15:23 → 17:24	Eclipse of Mimas by Saturn
30, 15:30 → 17:37	Occultation of Mimas by Saturn
30, 17:36 → 19:33	Shadow transit of Enceladus on top of Saturn
30, 17:45 → 19:54	Transit of Enceladus on top of Saturn

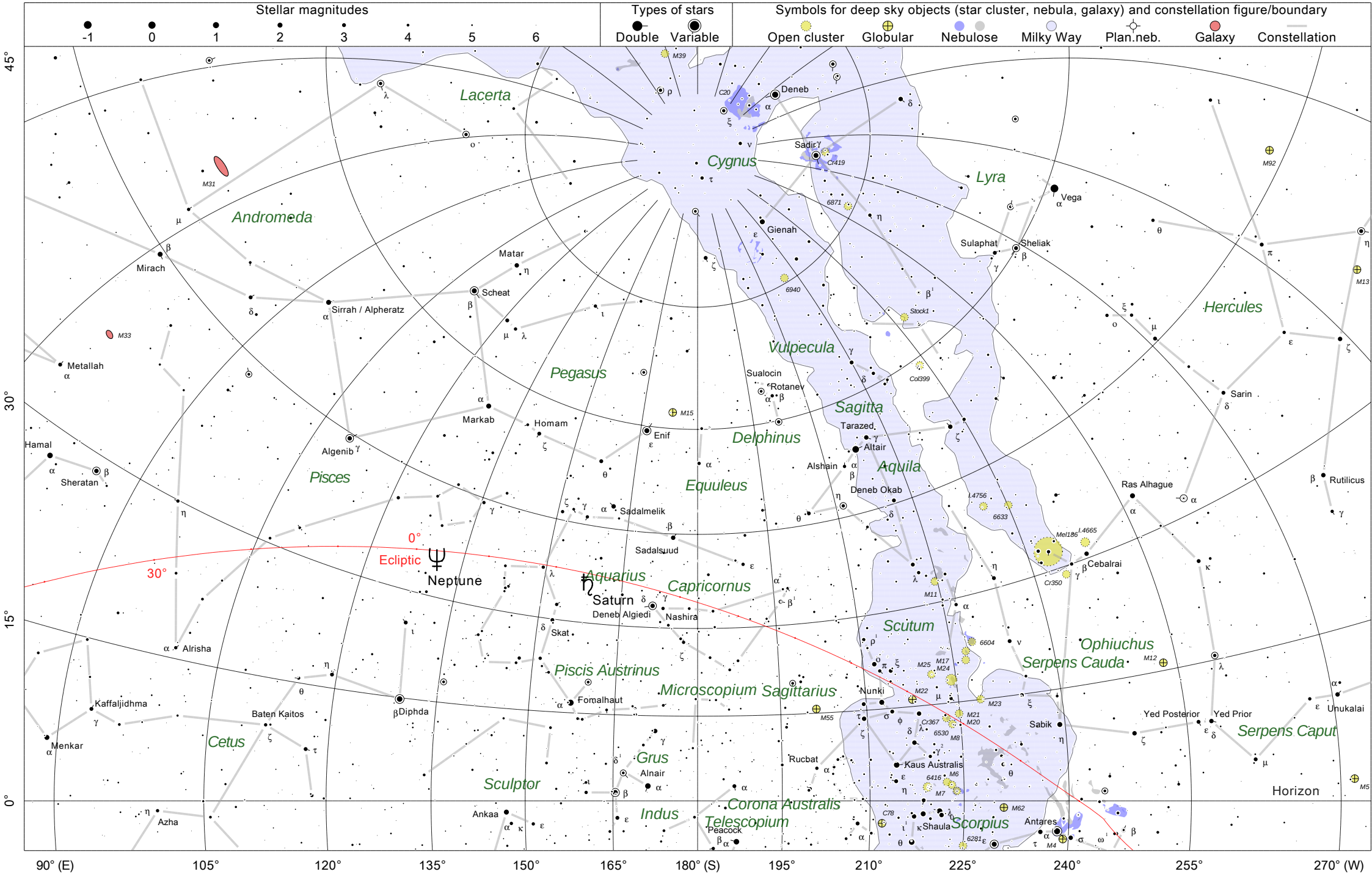
Sky on July 15, 2023, 00:00 h (UT)



Astronomical events for August

Date (UT)	Event description
1, 01:35 → 03:36	Shadow transit of Mimas on top of Saturn
1, 01:42 → 03:49	Transit of Mimas on top of Saturn
1, 02:29 → 04:26	Shadow transit of Enceladus on top of Saturn
1, 02:38 → 04:46	Transit of Enceladus on top of Saturn
1, 18:32	Full Moon (supermoon)
1, 18:59 → 20:53	Eclipse of Enceladus by Saturn
1, 19:04 → 21:12	Occultation of Enceladus by Saturn
1, 20:17 → 21:04	Occultation of Dione by Saturn
1, 21:11	Minimum of eclipsing binary β Lyr
2, 05:52	Moon's perigee (parallax = 1° 1' 20.936")
2, 06:26	Minimum of eclipsing binary λ Tau
2, 08:06	Minimum of eclipsing binary β Per
2, 09:38 → 11:50	Shadow transit of Ganymede on top of Jupiter
2, 11:14 → 13:15	Eclipse of Mimas by Saturn
2, 11:21 → 13:27	Occultation of Mimas by Saturn
2, 11:23 → 13:19	Shadow transit of Enceladus on top of Saturn
2, 11:30 → 13:38	Transit of Enceladus on top of Saturn
2, 11:32 → 13:47	Eclipse of Io by Jupiter
2, 12:57 → 15:10	Occultation of Io by Jupiter
2, 21:16	Conjunction Mercury-ρ Leo
3, 03:49 → 05:46	Eclipse of Enceladus by Saturn
3, 03:57 → 06:04	Occultation of Enceladus by Saturn
3, 05:11 → 05:47	Transit of Dione on top of Saturn
3, 12:31	Conjunction Moon-Saturn
3, 20:16 → 22:13	Shadow transit of Enceladus on top of Saturn
3, 20:23 → 22:31	Transit of Enceladus on top of Saturn
3, 21:26 → 23:28	Shadow transit of Mimas on top of Saturn
3, 21:33 → 23:39	Transit of Mimas on top of Saturn
4, 12:37 → 14:24	Eclipse of Tethys by Saturn
4, 12:42 → 14:39	Eclipse of Enceladus by Saturn
4, 12:44 → 14:50	Occultation of Tethys by Saturn
4, 12:49 → 14:56	Occultation of Enceladus by Saturn
4, 14:02 → 14:38	Occultation of Dione by Saturn
4, 22:49	Conjunction Moon-Neptune
5, 04:55	Minimum of eclipsing binary β Per
5, 05:09 → 07:06	Shadow transit of Enceladus on top of Saturn
5, 05:16 → 07:23	Transit of Enceladus on top of Saturn
5, 07:06 → 09:07	Eclipse of Mimas by Saturn
5, 07:12 → 09:17	Occultation of Mimas by Saturn
5, 21:35 → 23:33	Eclipse of Enceladus by Saturn
5, 21:42 → 23:49	Occultation of Enceladus by Saturn
5, 22:58 → 23:19	Transit of Dione on top of Saturn
5, 23:28 → 6, 01:41	Eclipse of Ganymede by Jupiter
6, 00:29 → 02:44	Eclipse of Io by Jupiter
6, 01:54 → 04:07	Occultation of Io by Jupiter
6, 05:18	Minimum of eclipsing binary λ Tau
7, 04:21 → 06:21	Eclipse of Mimas by Saturn
7, 04:26 → 06:30	Occultation of Mimas by Saturn
7, 06:28 → 08:26	Eclipse of Enceladus by Saturn
7, 06:35 → 08:41	Occultation of Enceladus by Saturn
7, 07:49 → 08:10	Occultation of Dione by Saturn
7, 08:34 → 10:22	Shadow transit of Tethys on top of Saturn
7, 08:41 → 10:45	Transit of Tethys on top of Saturn
8, 01:44	Minimum of eclipsing binary β Per
8, 08:39	Conjunction Moon-Jupiter
8, 10:28	**Moon's last quarter**
8, 14:32 → 16:33	Shadow transit of Mimas on top of Saturn
8, 14:37 → 16:42	Transit of Mimas on top of Saturn
8, 15:22 → 17:20	Eclipse of Enceladus by Saturn
8, 15:28 → 17:34	Occultation of Enceladus by Saturn
8, 22:39	Conjunction Moon-Uranus
9, 00:22	Lunar Transient Phenomena Lunar-X
9, 05:53 → 07:41	Shadow transit of Tethys on top of Saturn
9, 05:59 → 08:02	Transit of Tethys on top of Saturn
9, 07:48 → 09:46	Shadow transit of Enceladus on top of Saturn
9, 07:54 → 10:00	Transit of Enceladus on top of Saturn
9, 13:27 → 15:41	Eclipse of Io by Jupiter
9, 13:39 → 15:50	Shadow transit of Ganymede on top of Jupiter
9, 14:51 → 17:04	Occultation of Io by Jupiter
10, 00:12 → 02:12	Eclipse of Mimas by Saturn
10, 00:15 → 02:13	Eclipse of Enceladus by Saturn
10, 00:17 → 02:21	Occultation of Mimas by Saturn
10, 00:21 → 02:26	Occultation of Enceladus by Saturn
10, 01:44	Maximum elongation of Mercury (27.400° E)
10, 04:11	Minimum of eclipsing binary λ Tau
10, 22:33	Minimum of eclipsing binary β Per
11, 09:08 → 11:06	Eclipse of Enceladus by Saturn
11, 09:14 → 11:18	Occultation of Enceladus by Saturn
11, 10:23 → 12:24	Shadow transit of Mimas on top of Saturn
11, 10:28 → 12:32	Transit of Mimas on top of Saturn
12, 01:34 → 03:33	Shadow transit of Enceladus on top of Saturn
12, 01:40 → 03:45	Transit of Enceladus on top of Saturn
12, 01:50 → 03:40	Eclipse of Tethys by Saturn
12, 01:56 → 03:58	Occultation of Tethys by Saturn
12, 07:39	Moon's maximum declination (27.980°)
12, 18:01 → 20:00	Eclipse of Enceladus by Saturn
12, 18:06 → 20:11	Occultation of Enceladus by Saturn
12, 18:56 → 19:37	NGC2266 behind Moon
12, 20:04 → 22:04	Eclipse of Mimas by Saturn
12, 20:08 → 22:11	Occultation of Mimas by Saturn
13, 02:24 → 04:38	Eclipse of Io by Jupiter
13, 02:59	Minimum elongation of Venus (7.670°)
13, 03:29 → 05:41	Eclipse of Ganymede by Jupiter
13, 03:48 → 06:01	Occultation of Io by Jupiter
13, 07:31	**Maximum of Perseids**
13, 08:02	Conjunction Mercury-Mars
13, 15:18	Minimum distance of Venus (0.289 AU)
13, 19:22	Minimum of eclipsing binary β Per
13, 21:45	Conjunction Moon-β Gem
14, 03:03	Minimum of eclipsing binary λ Tau
14, 17:19 → 19:18	Eclipse of Mimas by Saturn
14, 17:22 → 19:24	Occultation of Mimas by Saturn
14, 19:21 → 21:20	Shadow transit of Enceladus on top of Saturn
14, 19:25 → 21:29	Transit of Enceladus on top of Saturn
14, 19:46	Minimum of eclipsing binary β Lyr
16, 03:29 → 05:29	Shadow transit of Mimas on top of Saturn
16, 03:32 → 05:35	Transit of Mimas on top of Saturn
16, 04:14 → 06:13	Shadow transit of Enceladus on top of Saturn
16, 04:18 → 06:22	Transit of Enceladus on top of Saturn
16, 09:38	**New Moon**
16, 11:55	Moon's apogee (parallax = 53' 55.443")
16, 15:21 → 17:35	Eclipse of Io by Jupiter
16, 16:11	Minimum of eclipsing binary β Per
16, 16:44 → 18:57	Occultation of Io by Jupiter
16, 17:40 → 19:50	Shadow transit of Ganymede on top of Jupiter
16, 19:07 → 20:58	Shadow transit of Tethys on top of Saturn
16, 19:11 → 21:10	Transit of Tethys on top of Saturn
16, 20:41 → 22:40	Eclipse of Enceladus by Saturn
16, 20:45 → 22:48	Occultation of Enceladus by Saturn
16, 23:20	Conjunction Moon-α Leo
17, 13:07 → 15:06	Shadow transit of Enceladus on top of Saturn
17, 13:10 → 15:10	Eclipse of Mimas by Saturn
17, 13:11 → 15:14	Transit of Enceladus on top of Saturn
17, 13:13 → 15:14	Occultation of Mimas by Saturn
18, 01:55	Minimum of eclipsing binary λ Tau
18, 12:22	Maximum of κ-Cygnids
18, 22:00 → 19, 24:00	Shadow transit of Enceladus on top of Saturn
18, 22:04 → 19, 00:06	Transit of Enceladus on top of Saturn
18, 23:20 → 19, 01:21	Shadow transit of Mimas on top of Saturn
18, 23:23 → 19, 01:25	Transit of Mimas on top of Saturn
19, 00:47	Conjunction Moon-Mars
19, 13:00	Minimum of eclipsing binary β Per
19, 14:27 → 16:27	Eclipse of Enceladus by Saturn
19, 14:31 → 16:33	Occultation of Enceladus by Saturn
19, 15:04 → 16:57	Eclipse of Tethys by Saturn
19, 15:08 → 17:05	Occultation of Tethys by Saturn
19, 22:51	Conjunction Moon-η Vir
20, 04:18 → 06:32	Eclipse of Io by Jupiter
20, 05:40 → 07:53	Occultation of Io by Jupiter
20, 07:30 → 09:41	Eclipse of Ganymede by Jupiter
20, 17:59	Comet 322P/SOHO MPC102103 starts to be visible to naked eye
20, 17:59	Minimum distance of 322P/SOHO MPC102103 (0.971 AU)
20, 23:59	Comet 322P/SOHO MPC102103 with maximum magnitude
21, 02:02	Minimum distance from Sun of 322P/SOHO MPC102103 (0.050 AU)
21, 11:05	Conjunction Moon-α Vir
21, 11:59	Comet 322P/SOHO MPC102103 ends to be visible to naked eye
22, 00:47	Minimum of eclipsing binary λ Tau
22, 06:17 → 08:16	Eclipse of Mimas by Saturn
22, 06:19 → 08:18	Occultation of Mimas by Saturn
22, 08:14 → 10:14	Eclipse of Enceladus by Saturn
22, 08:16 → 10:17	Occultation of Enceladus by Saturn
22, 09:49	Minimum of eclipsing binary β Per
23, 15:01	Conjunction Mars-β Vir
23, 16:26 → 18:26	Shadow transit of Mimas on top of Saturn
23, 16:27 → 18:28	Transit of Mimas on top of Saturn
23, 17:07 → 19:07	Eclipse of Enceladus by Saturn
23, 17:09 → 19:10	Occultation of Enceladus by Saturn
23, 17:52	Lunar Transient Phenomena Lunar-X
24, 08:20 → 10:14	Shadow transit of Tethys on top of Saturn
24, 08:23 → 10:17	Transit of Tethys on top of Saturn
24, 09:33 → 11:33	Shadow transit of Enceladus on top of Saturn
24, 09:35 → 11:35	Transit of Enceladus on top of Saturn
24, 09:57	**Moon's first quarter**
24, 23:32 → 25, 00:26	σ Sco behind Moon
25, 02:00 → 04:01	Eclipse of Enceladus by Saturn
25, 02:02 → 04:02	Occultation of Enceladus by Saturn
25, 02:09 → 04:07	Eclipse of Mimas by Saturn
25, 02:09 → 02:39	NGC6144 behind Moon
25, 02:09 → 02:39	IC4606 behind Moon
25, 02:10 → 04:08	Occultation of Mimas by Saturn
25, 03:13	Conjunction Moon-α Sco
25, 06:38	Minimum of eclipsing binary β Per
25, 21:12 → 22:29	NGC6316 behind Moon
25, 23:39	Minimum of eclipsing binary λ Tau
26, 10:54 → 12:54	Eclipse of Enceladus by Saturn
26, 10:55 → 12:54	Occultation of Enceladus by Saturn
26, 12:17 → 14:17	Shadow transit of Mimas on top of Saturn
26, 12:18 → 14:17	Transit of Mimas on top of Saturn
26, 20:22	Moon's minimum declination (-28.093°)
26, 21:53	Conjunction Moon-δ Sgr
27, 03:19 → 05:20	Shadow transit of Enceladus on top of Saturn
27, 03:21 → 05:20	Transit of Enceladus on top of Saturn
27, 04:18 → 06:13	Eclipse of Tethys by Saturn
27, 04:20 → 06:13	Occultation of Tethys by Saturn
27, 08:28	Opposition of Saturn (elongation 178.219°)
27, 13:18	Conjunction Moon-τ Sgr
27, 18:21	Minimum of eclipsing binary β Lyr
28, 03:27	Minimum of eclipsing binary β Per
29, 19:15 → 21:14	Eclipse of Mimas by Saturn
29, 19:16 → 21:12	Occultation of Mimas by Saturn
29, 21:06 → 23:07	Shadow transit of Enceladus on top of Saturn
29, 21:07 → 23:05	Transit of Enceladus on top of Saturn
29, 22:32	Minimum of eclipsing binary λ Tau
30, 15:51	Moon's perigee (parallax = 1° 1' 23.733")
30, 18:49	Conjunction Moon-Saturn
31, 00:16	Minimum of eclipsing binary β Per
31, 01:35	Full Moon (supermoon)
31, 05:23 → 07:20	Transit of Mimas on top of Saturn
31, 05:23 → 07:23	Shadow transit of Mimas on top of Saturn
31, 05:59 → 08:01	Shadow transit of Enceladus on top of Saturn
31, 05:59 → 07:57	Transit of Enceladus on top of Saturn
31, 21:35 → 23:31	Shadow transit of Tethys on top of Saturn
31, 21:36 → 23:24	Transit of Tethys on top of Saturn

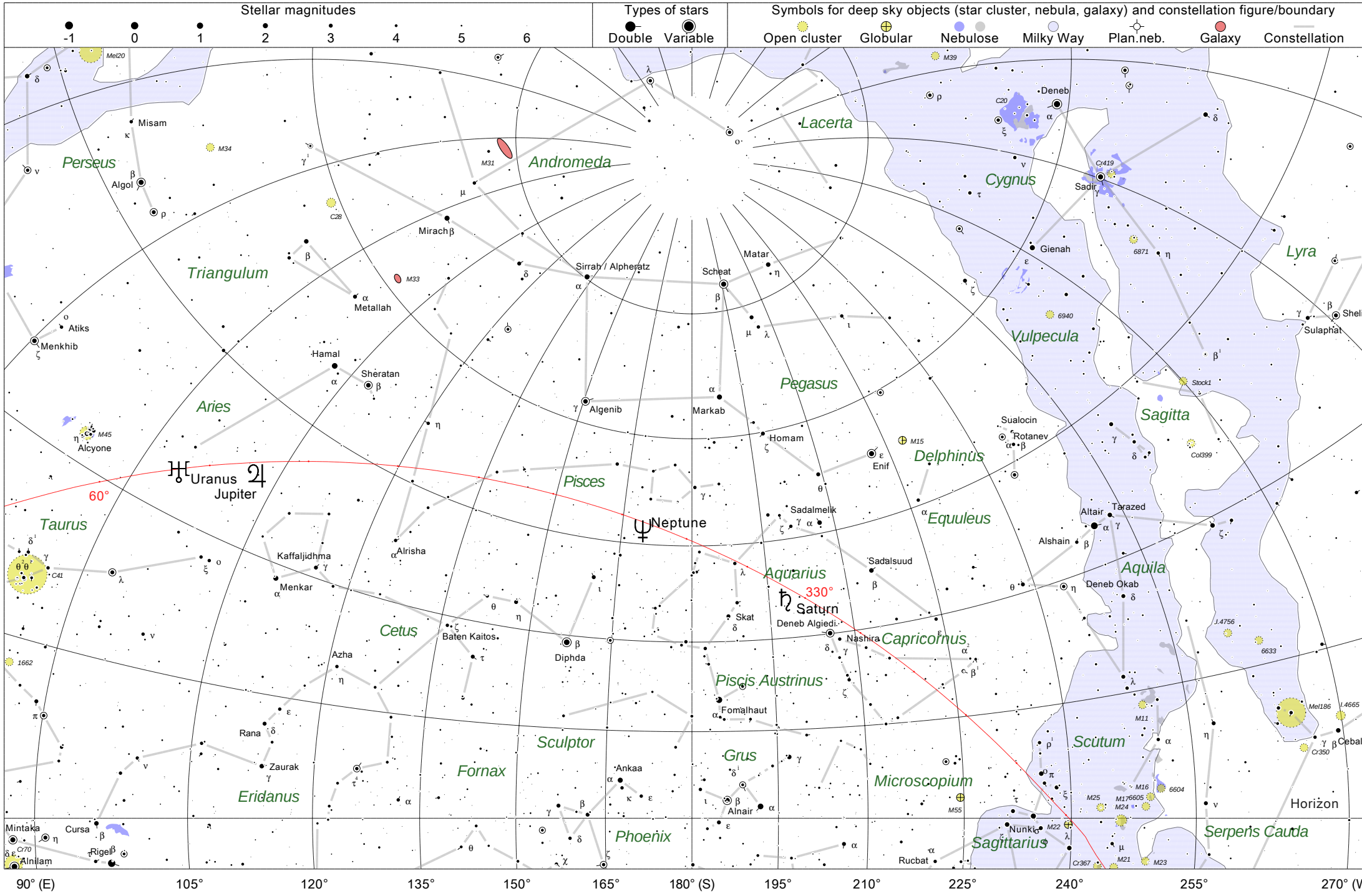
Sky on August 15, 2023, 00:00 h (UT)



Astronomical events for September

Date (UT)	Event description
31, 22:27 → 1, 00:28	Eclipse of Enceladus by Saturn
31, 22:27 → 1, 00:24	Occultation of Enceladus by Saturn
1, 09:37	Conjunction Moon-Neptune
1, 14:50	Maximum of Aurigids
1, 14:52 → 16:49	Transit of Enceladus on top of Saturn
1, 14:52 → 16:54	Shadow transit of Enceladus on top of Saturn
1, 15:07 → 17:03	Occultation of Mimas by Saturn
1, 15:07 → 17:05	Eclipse of Mimas by Saturn
2, 21:05	Minimum of eclipsing binary β Per
2, 21:24	Minimum of eclipsing binary λ Tau
2, 23:45 → 3, 01:41	Transit of Enceladus on top of Saturn
2, 23:46 → 3, 01:47	Shadow transit of Enceladus on top of Saturn
3, 01:14 → 03:10	Transit of Mimas on top of Saturn
3, 01:14 → 03:14	Shadow transit of Mimas on top of Saturn
3, 16:13 → 18:08	Occultation of Enceladus by Saturn
3, 16:13 → 18:15	Eclipse of Enceladus by Saturn
3, 17:32 → 19:30	Eclipse of Tethys by Saturn
3, 17:33 → 19:20	Occultation of Tethys by Saturn
4, 13:10	Conjunction Mars-η Vir
4, 17:51	Conjunction Moon-Jupiter
5, 08:40	Conjunction Moon-Uranus
5, 17:54	Minimum of eclipsing binary β Per
6, 08:13 → 10:07	Occultation of Mimas by Saturn
6, 08:14 → 10:12	Eclipse of Mimas by Saturn
6, 09:58 → 11:53	Occultation of Enceladus by Saturn
6, 10:00 → 12:02	Eclipse of Enceladus by Saturn
6, 16:31	Minimum elongation of Mercury (3.738°)
6, 20:16	Minimum of eclipsing binary λ Tau
6, 22:21	**Moon's last quarter**
7, 12:18	Lunar Transient Phenomena Lunar-X
7, 18:18 → 20:13	Transit of Mimas on top of Saturn
7, 18:20 → 20:19	Shadow transit of Mimas on top of Saturn
7, 18:51 → 20:46	Occultation of Enceladus by Saturn
7, 18:53 → 20:55	Eclipse of Enceladus by Saturn
8, 10:49 → 12:48	Shadow transit of Tethys on top of Saturn
8, 10:49 → 12:32	Transit of Tethys on top of Saturn
8, 11:17 → 13:11	Transit of Enceladus on top of Saturn
8, 11:19 → 13:21	Shadow transit of Enceladus on top of Saturn
8, 13:18	Moon's maximum declination (28.165°)
8, 14:43	Minimum of eclipsing binary β Per
9, 03:44 → 05:38	Occultation of Enceladus by Saturn
9, 03:46 → 05:49	Eclipse of Enceladus by Saturn
9, 04:04 → 05:57	Occultation of Mimas by Saturn
9, 04:06 → 06:04	Eclipse of Mimas by Saturn
9, 11:29 → 12:39	NGC2331 behind Moon
9, 16:55	Minimum of eclipsing binary β Lyr
9, 23:23	**Maximum of Sep. ϵ-Perseids**
10, 02:42	Conjunction Moon-β Gem
10, 12:37 → 14:31	Occultation of Enceladus by Saturn
10, 12:40 → 14:42	Eclipse of Enceladus by Saturn
10, 14:09 → 16:03	Transit of Mimas on top of Saturn
10, 14:11 → 16:11	Shadow transit of Mimas on top of Saturn
10, 19:08	Minimum of eclipsing binary λ Tau
11, 05:03 → 06:55	Transit of Enceladus on top of Saturn
11, 05:05 → 07:08	Shadow transit of Enceladus on top of Saturn
11, 06:46 → 08:27	Occultation of Tethys by Saturn
11, 06:47 → 08:47	Eclipse of Tethys by Saturn
11, 11:32	Minimum of eclipsing binary β Per
11, 23:59	New Coptic year
11, 23:59	New Ethiopic year
12, 15:42	Moon's apogee (parallax = 53' 58.195")
13, 03:27	Conjunction Moon-α Leo
13, 21:10 → 23:02	Occultation of Mimas by Saturn
13, 21:13 → 23:10	Eclipse of Mimas by Saturn
13, 21:58	Conjunction Moon-Mercury
13, 22:49 → 14, 00:40	Transit of Enceladus on top of Saturn
13, 22:52 → 14, 00:55	Shadow transit of Enceladus on top of Saturn
14, 08:20	Minimum of eclipsing binary β Per
14, 18:01	Minimum of eclipsing binary λ Tau
15, 01:40	**New Moon**
15, 07:14 → 09:06	Transit of Mimas on top of Saturn
15, 07:17 → 09:16	Shadow transit of Mimas on top of Saturn
15, 07:41 → 09:33	Transit of Enceladus on top of Saturn
15, 07:45 → 09:48	Shadow transit of Enceladus on top of Saturn
15, 23:59	New Hebrew year
16, 00:02 → 01:39	Transit of Tethys on top of Saturn
16, 00:03 → 02:05	Shadow transit of Tethys on top of Saturn
16, 00:09 → 02:00	Occultation of Enceladus by Saturn
16, 00:13 → 02:16	Eclipse of Enceladus by Saturn
16, 02:34 → 03:18	η Vir behind Moon
16, 16:35 → 18:25	Transit of Enceladus on top of Saturn
16, 16:38 → 18:42	Shadow transit of Enceladus on top of Saturn
16, 17:02 → 18:52	Occultation of Mimas by Saturn
16, 17:05 → 19:02	Eclipse of Mimas by Saturn
16, 20:28 → 20:52	Mars behind Moon
17, 05:09	Minimum of eclipsing binary β Per
17, 18:35	Conjunction Moon-α Vir
18, 01:27 → 03:17	Transit of Enceladus on top of Saturn
18, 01:31 → 03:35	Shadow transit of Enceladus on top of Saturn
18, 03:05 → 04:56	Transit of Mimas on top of Saturn
18, 03:09 → 05:08	Shadow transit of Mimas on top of Saturn
18, 16:53	Minimum of eclipsing binary λ Tau
18, 17:55 → 19:45	Occultation of Enceladus by Saturn
18, 17:59 → 20:03	Eclipse of Enceladus by Saturn
18, 20:00 → 21:35	Occultation of Tethys by Saturn
18, 20:01 → 22:04	Eclipse of Tethys by Saturn
19, 11:13	Opposition of Neptune (elongation 178.724°)
20, 01:04 → 01:29	NGC5897 behind Moon
20, 01:58	Minimum of eclipsing binary β Per
20, 17:18 → 18:52	Occultation of Tethys by Saturn
20, 17:20 → 19:23	Eclipse of Tethys by Saturn
20, 19:13 → 21:02	Transit of Enceladus on top of Saturn
20, 19:18 → 21:22	Shadow transit of Enceladus on top of Saturn
21, 04:56	σ Sco behind Moon
21, 07:48	Conjunction Moon-α Sco
21, 10:08 → 11:57	Occultation of Mimas by Saturn
21, 10:12 → 12:09	Eclipse of Mimas by Saturn
21, 11:41 → 13:30	Occultation of Enceladus by Saturn
21, 11:46 → 13:50	Eclipse of Enceladus by Saturn
22, 05:13	Lunar Transient Phenomena Lunar-X
22, 13:16	Maximum elongation of Mercury (17.861° W)
22, 15:30	Minimum of eclipsing binary β Lyr
22, 15:45	Minimum of eclipsing binary λ Tau
22, 19:32	**Moon's first quarter**
22, 20:09 → 21:59	Transit of Mimas on top of Saturn
22, 20:14 → 22:13	Shadow transit of Mimas on top of Saturn
22, 20:35 → 22:23	Occultation of Enceladus by Saturn
22, 20:39 → 22:44	Eclipse of Enceladus by Saturn
22, 22:47	Minimum of eclipsing binary β Per
23, 03:42	Moon's minimum declination (-28.252°)
23, 06:50	Autumn equinox
23, 12:59 → 14:47	Transit of Enceladus on top of Saturn
23, 13:05 → 15:09	Shadow transit of Enceladus on top of Saturn
23, 13:16 → 14:47	Transit of Tethys on top of Saturn
23, 13:18 → 15:22	Shadow transit of Tethys on top of Saturn
24, 00:05	Conjunction Moon-τ Sgr
24, 05:28 → 07:15	Occultation of Enceladus by Saturn
24, 05:33 → 07:37	Eclipse of Enceladus by Saturn
24, 05:59 → 07:48	Occultation of Mimas by Saturn
24, 06:04 → 08:01	Eclipse of Mimas by Saturn
25, 14:21 → 16:08	Occultation of Enceladus by Saturn
25, 14:26 → 16:31	Eclipse of Enceladus by Saturn
25, 16:00 → 17:49	Transit of Mimas on top of Saturn
25, 16:06 → 18:05	Shadow transit of Mimas on top of Saturn
25, 19:36	Minimum of eclipsing binary β Per
26, 14:37	Minimum of eclipsing binary λ Tau
27, 04:55	Conjunction Moon-Saturn
28, 00:03	Maximum of Dayt. Sextantids
28, 01:05	Moon's perigee (parallax = 1° 0' 56.368")
28, 06:32 → 08:00	Occultation of Tethys by Saturn
28, 06:35 → 08:40	Eclipse of Tethys by Saturn
28, 08:07 → 09:53	Occultation of Enceladus by Saturn
28, 08:13 → 10:18	Eclipse of Enceladus by Saturn
28, 16:25	Minimum of eclipsing binary β Per
28, 17:20	Conjunction Moon-Neptune
28, 23:06 → 29, 00:53	Occultation of Mimas by Saturn
28, 23:11 → 29, 01:08	Eclipse of Mimas by Saturn
29, 00:32 → 02:17	Transit of Enceladus on top of Saturn
29, 00:38 → 02:43	Shadow transit of Enceladus on top of Saturn
29, 09:57	Full Moon
30, 09:05 → 10:53	Transit of Mimas on top of Saturn
30, 09:12 → 11:11	Shadow transit of Mimas on top of Saturn
30, 09:25 → 11:10	Transit of Enceladus on top of Saturn
30, 09:31 → 11:37	Shadow transit of Enceladus on top of Saturn
30, 13:30	Minimum of eclipsing binary λ Tau

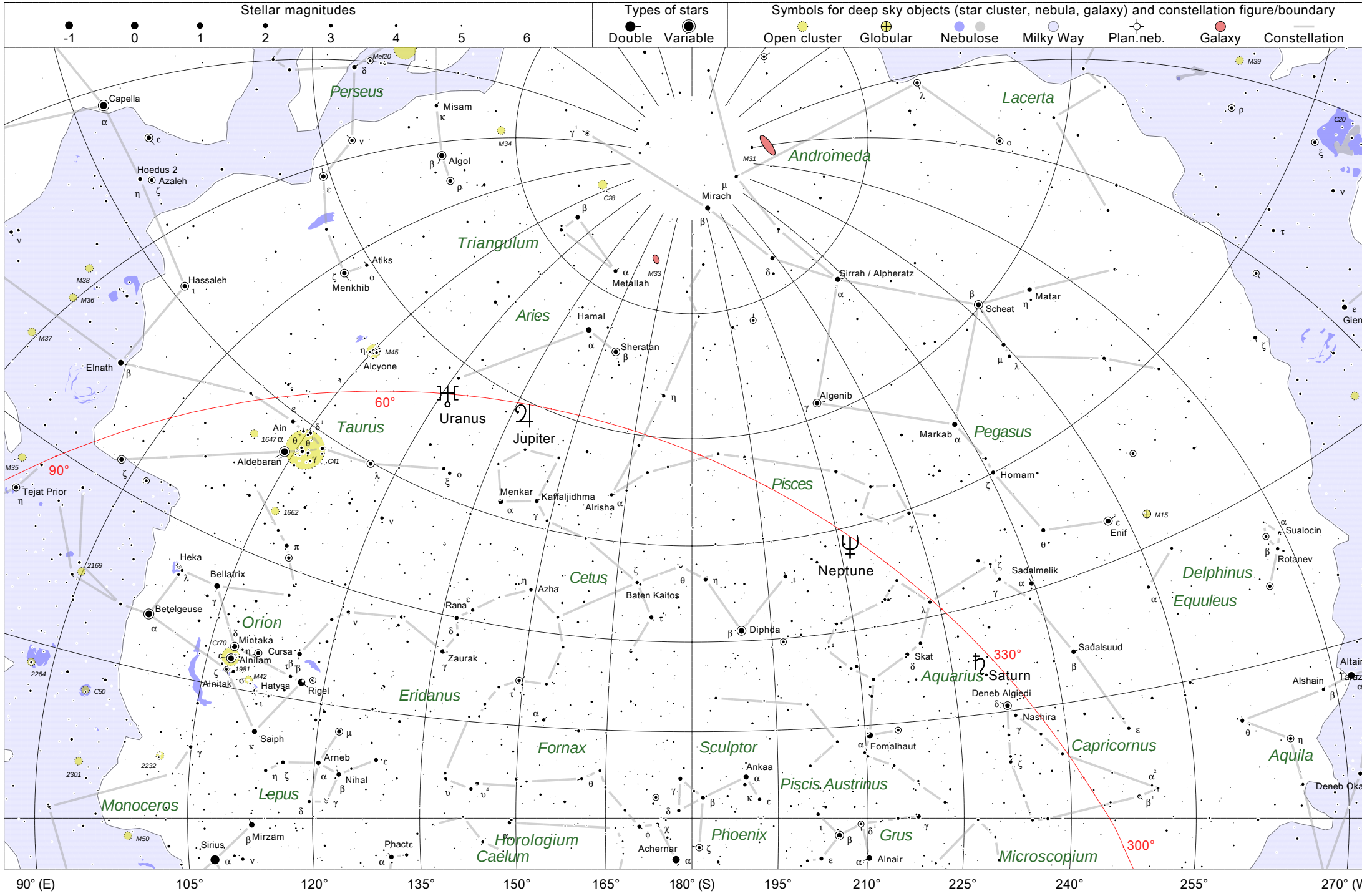
Sky on September 15, 2023, 00:00 h (UT)



Astronomical events for October

Date (UT)	Event description
1, 01:53 → 03:38	Occultation of Enceladus by Saturn
1, 02:00 → 04:05	Eclipse of Enceladus by Saturn
1, 02:30 → 03:56	Transit of Tethys on top of Saturn
1, 02:33 → 04:39	Shadow transit of Tethys on top of Saturn
1, 13:14	Minimum of eclipsing binary β Per
1, 18:18 → 20:02	Transit of Enceladus on top of Saturn
1, 18:24 → 20:30	Shadow transit of Enceladus on top of Saturn
1, 18:57 → 20:44	Occultation of Mimas by Saturn
1, 19:04 → 21:01	Eclipse of Mimas by Saturn
1, 23:50	Conjunction Moon-Jupiter
2, 01:53	Conjunction Venus-o Leo
2, 15:54	Conjunction Moon-Uranus
3, 03:11 → 04:55	Transit of Enceladus on top of Saturn
3, 03:18 → 05:24	Shadow transit of Enceladus on top of Saturn
3, 04:56 → 06:43	Transit of Mimas on top of Saturn
3, 05:03 → 07:02	Shadow transit of Mimas on top of Saturn
3, 12:02	Conjunction Mars-α Vir
4, 10:03	Minimum of eclipsing binary β Per
4, 12:22	Minimum of eclipsing binary λ Tau
5, 14:05	Minimum of eclipsing binary β Lyr
5, 19:46 → 21:09	Occultation of Tethys by Saturn
5, 19:49 → 21:57	Eclipse of Tethys by Saturn
5, 20:31	Moon's maximum declination (28.293°)
5, 20:57 → 22:40	Transit of Enceladus on top of Saturn
5, 21:04 → 23:11	Shadow transit of Enceladus on top of Saturn
6, 01:03 → 02:19	Transit of Ganymede on top of Jupiter
6, 01:48 → 04:02	Shadow transit of Io on top of Jupiter
6, 02:31 → 04:43	Transit of Io on top of Jupiter
6, 10:11	Maximum of Oct. Camelopard.
6, 12:04 → 13:49	Occultation of Mimas by Saturn
6, 12:11 → 14:08	Eclipse of Mimas by Saturn
6, 12:53 → 13:16	Eclipse of Dione by Saturn
6, 13:26 → 15:09	Occultation of Enceladus by Saturn
6, 13:33 → 15:40	Eclipse of Enceladus by Saturn
6, 13:48	**Moon's last quarter**
7, 00:53	Conjunction Moon-ι Gem
7, 01:13	Lunar Transient Phenomena Lunar-X
7, 06:52	Minimum of eclipsing binary β Per
7, 10:49	Conjunction Moon-β Gem
7, 21:45 → 22:02	Shadow transit of Dione on top of Saturn
7, 22:01 → 23:47	Transit of Mimas on top of Saturn
7, 22:09 → 8, 00:08	Shadow transit of Mimas on top of Saturn
7, 22:19 → 8, 00:02	Occultation of Enceladus by Saturn
7, 22:20	Conjunction Mercury-η Vir
7, 22:26 → 8, 00:33	Eclipse of Enceladus by Saturn
8, 11:14	Minimum of eclipsing binary λ Tau
8, 14:43 → 16:26	Transit of Enceladus on top of Saturn
8, 14:51 → 16:58	Shadow transit of Enceladus on top of Saturn
8, 15:44 → 17:06	Transit of Tethys on top of Saturn
8, 15:48 → 17:56	Shadow transit of Tethys on top of Saturn
9, 06:47	Maximum of Draconids
9, 07:12 → 08:55	Occultation of Enceladus by Saturn
9, 07:20 → 09:27	Eclipse of Enceladus by Saturn
9, 07:56 → 09:40	Occultation of Mimas by Saturn
9, 08:03 → 10:00	Eclipse of Mimas by Saturn
9, 14:32 → 15:51	Occultation of Ganymede by Jupiter
9, 14:43	Conjunction Venus-α Leo
9, 14:45 → 16:59	Shadow transit of Io on top of Jupiter
9, 15:24 → 17:36	Transit of Io on top of Jupiter
10, 03:41	Minimum of eclipsing binary β Per
10, 03:41	Moon's apogee (parallax = 54' 5.090")
10, 07:19	Conjunction Moon-η Leo
10, 14:20	Conjunction Moon-α Leo
10, 16:05 → 17:48	Occultation of Enceladus by Saturn
10, 16:13 → 18:20	Eclipse of Enceladus by Saturn
10, 17:53 → 19:37	Transit of Mimas on top of Saturn
10, 18:00 → 20:00	Shadow transit of Mimas on top of Saturn
10, 21:38	Maximum of S. Taurids
11, 02:57 → 03:29	NGC3351 (M95) behind Moon
11, 04:03 → 04:53	NGC3368 (M96) behind Moon
11, 21:55	Maximum of δ-Aurigids
12, 10:06	Minimum of eclipsing binary λ Tau
12, 19:46	Conjunction Moon-β Vir
13, 00:30	Minimum of eclipsing binary β Per
13, 01:47 → 03:50	Shadow transit of Ganymede on top of Jupiter
13, 03:42 → 05:56	Shadow transit of Io on top of Jupiter
13, 04:16 → 06:28	Transit of Io on top of Jupiter
13, 04:23 → 05:39	Transit of Ganymede on top of Jupiter
13, 08:59 → 10:20	η Vir behind Moon
13, 09:00 → 10:20	Occultation of Tethys by Saturn
13, 09:02 → 09:35	Shadow transit of Dione on top of Saturn
13, 09:04 → 11:14	Eclipse of Tethys by Saturn
13, 09:51 → 11:33	Occultation of Enceladus by Saturn
13, 10:00 → 12:07	Eclipse of Enceladus by Saturn
14, 01:02 → 02:46	Occultation of Mimas by Saturn
14, 01:10 → 03:07	Eclipse of Mimas by Saturn
14, 02:16 → 03:57	Transit of Enceladus on top of Saturn
14, 02:25 → 04:32	Shadow transit of Enceladus on top of Saturn
14, 06:40	Conjunction Moon-Mercury
14, 17:55	**New Moon**
14, 18:00	**Solar eclipse (central, annular)**
14, 23:34	Conjunction Moon-α Vir
15, 10:58 → 12:41	Transit of Mimas on top of Saturn
15, 11:06 → 13:06	Shadow transit of Mimas on top of Saturn
15, 11:09 → 12:50	Transit of Enceladus on top of Saturn
15, 11:18 → 13:26	Shadow transit of Enceladus on top of Saturn
15, 15:12	Conjunction Moon-Mars
15, 21:19	Minimum of eclipsing binary β Per
16, 03:38 → 05:19	Occultation of Enceladus by Saturn
16, 03:47 → 05:54	Eclipse of Enceladus by Saturn
16, 04:58 → 06:16	Transit of Tethys on top of Saturn
16, 05:03 → 07:13	Shadow transit of Tethys on top of Saturn
16, 08:58	Minimum of eclipsing binary λ Tau
16, 15:38 → 17:42	Eclipse of Ganymede by Jupiter
16, 16:39 → 18:54	Shadow transit of Io on top of Jupiter
16, 17:08 → 19:20	Transit of Io on top of Jupiter
16, 17:51 → 19:11	Occultation of Ganymede by Jupiter
16, 20:02 → 21:43	Transit of Enceladus on top of Saturn
16, 20:11 → 22:19	Shadow transit of Enceladus on top of Saturn
16, 20:54 → 22:38	Occultation of Mimas by Saturn
16, 21:02 → 23:00	Eclipse of Mimas by Saturn
17, 04:45 → 05:30	NGC5897 behind Moon
18, 04:55 → 06:36	Transit of Enceladus on top of Saturn
18, 05:05 → 07:13	Shadow transit of Enceladus on top of Saturn
18, 06:49 → 08:32	Transit of Mimas on top of Saturn
18, 06:57 → 08:57	Shadow transit of Mimas on top of Saturn
18, 08:37 → 09:32	σ Sco behind Moon
18, 11:23 → 12:26	NGC6144 behind Moon
18, 11:23 → 12:26	IC4606 behind Moon
18, 12:40	Minimum of eclipsing binary β Lyr
18, 12:45 → 14:01	α Sco behind Moon
18, 18:08	Minimum of eclipsing binary β Per
18, 22:10	Conjunction Mercury-α Vir
18, 23:24	Maximum of ϵ-Geminids
20, 04:03 → 05:46	Transit of Mimas on top of Saturn
20, 04:12 → 06:12	Shadow transit of Mimas on top of Saturn
20, 05:12 → 06:00	Eclipse of Dione by Saturn
20, 05:37 → 07:51	Shadow transit of Io on top of Jupiter
20, 05:48 → 07:50	Shadow transit of Ganymede on top of Jupiter
20, 06:00 → 08:12	Transit of Io on top of Jupiter
20, 07:39 → 08:57	Transit of Ganymede on top of Jupiter
20, 07:51	Minimum of eclipsing binary λ Tau
20, 09:19	Moon's minimum declination (-28.305°)
20, 09:50	Minimum elongation of Mercury (0.780°)
20, 22:15 → 23:31	Occultation of Tethys by Saturn
20, 22:20 → 21, 00:32	Eclipse of Tethys by Saturn
20, 22:41 → 21, 00:21	Transit of Enceladus on top of Saturn
20, 22:51 → 21, 01:00	Shadow transit of Enceladus on top of Saturn
21, 04:47	Conjunction Moon-τ Sgr
21, 14:01 → 15:44	Occultation of Mimas by Saturn
21, 14:02 → 14:49	Shadow transit of Dione on top of Saturn
21, 14:10 → 16:07	Eclipse of Mimas by Saturn
21, 14:57	Minimum of eclipsing binary β Per
21, 15:10 → 16:51	Occultation of Enceladus by Saturn
21, 15:21 → 17:29	Eclipse of Enceladus by Saturn
21, 17:10	Lunar Transient Phenomena Lunar-X
21, 23:50	Maximum of Orionids
22, 03:29	**Moon's first quarter**
22, 23:54 → 23, 01:37	Transit of Mimas on top of Saturn
23, 00:03 → 02:03	Shadow transit of Mimas on top of Saturn
23, 00:04 → 01:44	Occultation of Enceladus by Saturn
23, 00:14 → 02:22	Eclipse of Enceladus by Saturn
23, 16:28 → 18:07	Transit of Enceladus on top of Saturn
23, 16:38 → 18:47	Shadow transit of Enceladus on top of Saturn
23, 18:13 → 19:28	Transit of Tethys on top of Saturn
23, 18:18 → 20:30	Shadow transit of Tethys on top of Saturn
23, 18:34 → 20:48	Shadow transit of Io on top of Jupiter
23, 18:52 → 21:04	Transit of Io on top of Jupiter
23, 19:40 → 21:43	Eclipse of Ganymede by Jupiter
23, 21:06 → 22:29	Occultation of Ganymede by Jupiter
24, 06:43	Minimum of eclipsing binary λ Tau
24, 08:57 → 10:37	Occultation of Enceladus by Saturn
24, 09:07 → 11:16	Eclipse of Enceladus by Saturn
24, 09:14	Conjunction Moon-Saturn
24, 09:53 → 11:35	Occultation of Mimas by Saturn
24, 10:02 → 12:00	Eclipse of Mimas by Saturn
24, 11:46	Minimum of eclipsing binary β Per
25, 00:11	Maximum of Leonis Minorids
25, 15:31 → 16:47	Transit of Tethys on top of Saturn
25, 15:37 → 17:50	Shadow transit of Tethys on top of Saturn
25, 16:33 → 17:29	Eclipse of Dione by Saturn
25, 17:55 → 19:30	Occultation of Enceladus by Saturn
25, 18:01 → 20:10	Eclipse of Enceladus by Saturn
25, 19:46 → 21:28	Transit of Mimas on top of Saturn
25, 19:55 → 21:55	Shadow transit of Mimas on top of Saturn
26, 02:53	Moon's perigee (parallax = 1° 0' 4.555")
26, 04:09	Conjunction Moon-Neptune
27, 07:32 → 09:46	Shadow transit of Io on top of Jupiter
27, 07:44 → 09:56	Transit of Io on top of Jupiter
27, 08:35	Minimum of eclipsing binary β Per
27, 09:50 → 11:50	Shadow transit of Ganymede on top of Jupiter
27, 10:53 → 12:15	Transit of Ganymede on top of Jupiter
27, 17:00 → 18:42	Transit of Mimas on top of Saturn
27, 17:09 → 19:09	Shadow transit of Mimas on top of Saturn
27, 19:07 → 20:47	Transit of Enceladus on top of Saturn
27, 19:18 → 21:28	Shadow transit of Enceladus on top of Saturn
28, 05:35	Minimum of eclipsing binary λ Tau
28, 11:29 → 12:45	Occultation of Tethys by Saturn
28, 11:35 → 13:49	Eclipse of Tethys by Saturn
28, 11:37 → 13:17	Occultation of Enceladus by Saturn
28, 11:48 → 13:57	Eclipse of Enceladus by Saturn
28, 20:14	**Lunar eclipse (partial, mag 0.12)**
28, 20:24	Full Moon
29, 03:00 → 04:42	Occultation of Mimas by Saturn
29, 03:09 → 05:07	Eclipse of Mimas by Saturn
29, 04:01 → 05:40	Transit of Enceladus on top of Saturn
29, 04:12 → 06:21	Shadow transit of Enceladus on top of Saturn
29, 08:11	Conjunction Moon-Jupiter
29, 13:22	Conjunction Mercury-Mars
29, 23:05	Conjunction Moon-Uranus
30, 05:24	Minimum of eclipsing binary β Per
30, 12:51 → 14:33	Transit of Mimas on top of Saturn
30, 12:54 → 14:33	Transit of Enceladus on top of Saturn
30, 13:01 → 15:01	Shadow transit of Mimas on top of Saturn
30, 13:05 → 15:15	Shadow transit of Enceladus on top of Saturn
31, 05:23 → 07:03	Occultation of Enceladus by Saturn
31, 05:34 → 07:44	Eclipse of Enceladus by Saturn
31, 07:27 → 08:42	Transit of Tethys on top of Saturn
31, 07:33 → 09:48	Shadow transit of Tethys on top of Saturn
31, 11:14	Minimum of eclipsing binary β Lyr
31, 18:38	Conjunction Mercury-α_2 Lib
31, 21:47 → 30, 22:26	Transit of Enceladus on top of Saturn
31, 21:58 → 30, 23:08	Shadow transit of Enceladus on top of Saturn
31, 22:52 → 30, 23:34	Occultation of Mimas by Saturn

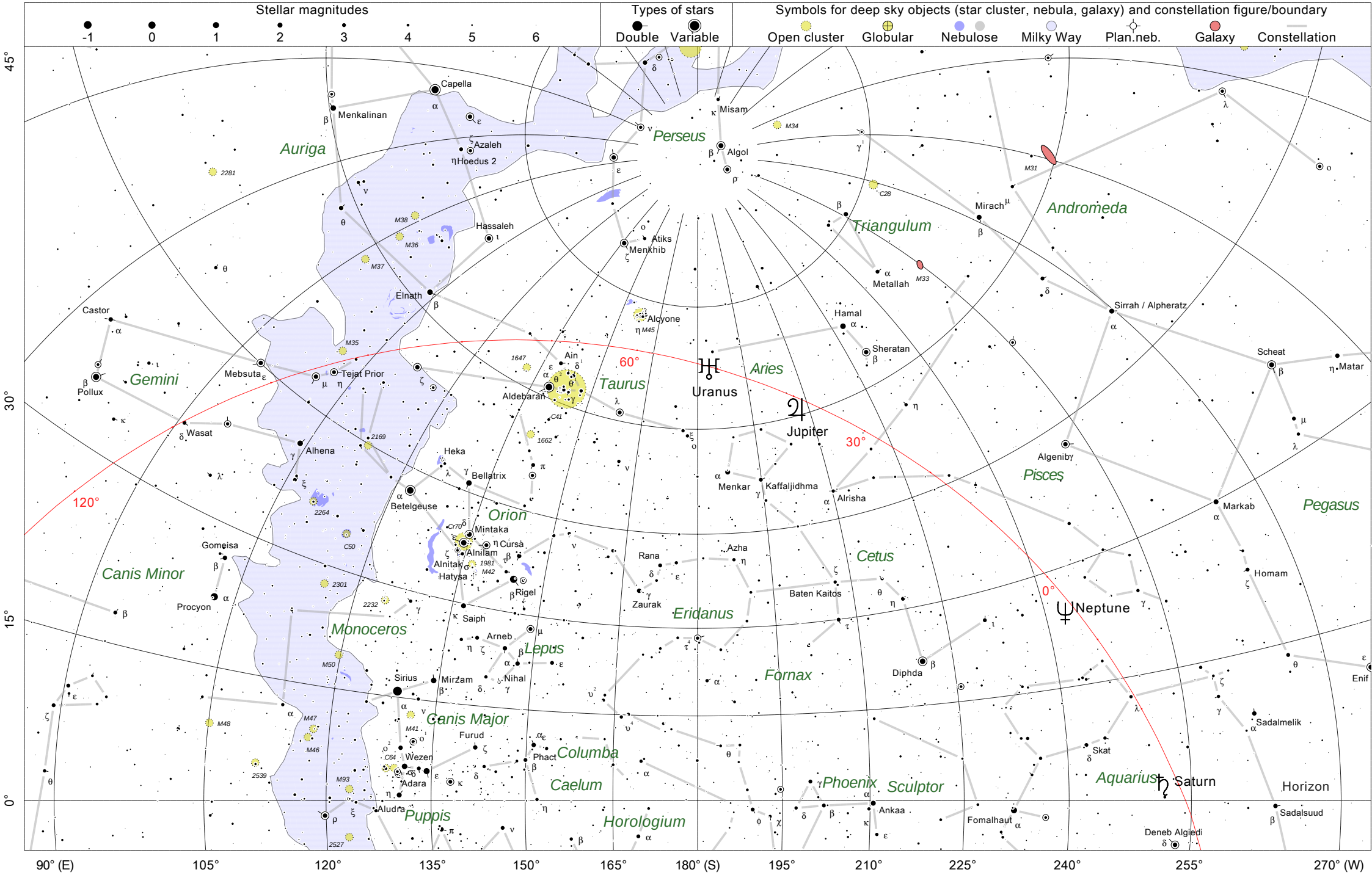
Sky on October 15, 2023, 00:00 h (UT)



Astronomical events for November

Date (UT)	Event description
31, 23:01 → 1, 01:00	Eclipse of Mimas by Saturn
1, 04:27	Minimum of eclipsing binary λ Tau
2, 02:13	Minimum of eclipsing binary β Per
2, 04:45 → 06:01	Transit of Tethys on top of Saturn
2, 04:52 → 07:07	Shadow transit of Tethys on top of Saturn
2, 05:11	Moon's maximum declination (28.289°)
2, 06:40 → 08:19	Transit of Enceladus on top of Saturn
2, 06:52 → 09:02	Shadow transit of Enceladus on top of Saturn
2, 08:42 → 10:24	Transit of Mimas on top of Saturn
2, 08:52 → 10:53	Shadow transit of Mimas on top of Saturn
2, 20:07 → 21:49	Occultation of Mimas by Saturn
2, 20:16 → 22:15	Eclipse of Mimas by Saturn
2, 21:36 → 22:40	Eclipse of Dione by Saturn
3, 01:06 → 01:27	NGC2331 behind Moon
3, 05:05	Opposition of Jupiter (elongation 178.588°)
3, 15:54	Conjunction Mars-α_2 Lib
3, 18:19	Conjunction Moon-β Gem
4, 05:56 → 07:39	Transit of Mimas on top of Saturn
4, 06:07 → 08:08	Shadow transit of Mimas on top of Saturn
4, 06:25 → 07:29	Shadow transit of Dione on top of Saturn
4, 08:03 → 09:43	Occultation of Enceladus by Saturn
4, 08:15 → 10:25	Eclipse of Enceladus by Saturn
4, 23:02	Minimum of eclipsing binary β Per
5, 00:27 → 02:06	Transit of Enceladus on top of Saturn
5, 00:39 → 02:49	Shadow transit of Enceladus on top of Saturn
5, 00:43 → 01:59	Occultation of Tethys by Saturn
5, 00:50 → 03:06	Eclipse of Tethys by Saturn
5, 03:20	Minimum of eclipsing binary λ Tau
5, 08:37	**Moon's last quarter**
5, 15:14	Lunar Transient Phenomena Lunar-X
5, 15:17 → 16:24	Eclipse of Dione by Saturn
5, 15:59 → 17:41	Occultation of Mimas by Saturn
5, 16:08 → 18:07	Eclipse of Mimas by Saturn
5, 16:56 → 18:36	Occultation of Enceladus by Saturn
5, 17:08 → 19:19	Eclipse of Enceladus by Saturn
6, 01:22	Conjunction Venus-β Vir
6, 19:11	Conjunction Moon-α Leo
6, 21:49	Moon's apogee (parallax = 54' 11.967")
6, 22:01 → 23:18	Occultation of Tethys by Saturn
6, 22:09 → 7, 00:25	Eclipse of Tethys by Saturn
7, 00:06 → 01:12	Shadow transit of Dione on top of Saturn
7, 01:48 → 03:30	Transit of Mimas on top of Saturn
7, 01:50 → 03:30	Occultation of Enceladus by Saturn
7, 01:58 → 03:59	Shadow transit of Mimas on top of Saturn
7, 02:02 → 04:12	Eclipse of Enceladus by Saturn
7, 19:51	Minimum of eclipsing binary β Per
8, 10:43 → 12:23	Occultation of Enceladus by Saturn
8, 10:55 → 13:06	Eclipse of Enceladus by Saturn
8, 11:51 → 13:33	Occultation of Mimas by Saturn
8, 12:01 → 14:00	Eclipse of Mimas by Saturn
9, 02:12	Minimum of eclipsing binary λ Tau
9, 10:36	Conjunction Moon-Venus
9, 17:47 → 18:56	Shadow transit of Dione on top of Saturn
9, 17:59 → 19:16	Transit of Tethys on top of Saturn
9, 18:08 → 20:24	Shadow transit of Tethys on top of Saturn
9, 18:44	Conjunction Moon-η Vir
9, 19:36 → 21:16	Occultation of Enceladus by Saturn
9, 19:49 → 21:59	Eclipse of Enceladus by Saturn
9, 21:39 → 23:21	Transit of Mimas on top of Saturn
9, 21:49 → 23:51	Shadow transit of Mimas on top of Saturn
10, 16:40	Minimum of eclipsing binary β Per
11, 06:55	Conjunction Moon-α Vir
11, 18:53 → 20:36	Transit of Mimas on top of Saturn
11, 19:04 → 21:06	Shadow transit of Mimas on top of Saturn
11, 20:53 → 22:33	Transit of Enceladus on top of Saturn
11, 21:06 → 23:17	Shadow transit of Enceladus on top of Saturn
12, 04:51	Conjunction Mercury-δ Sco
12, 13:23 → 15:03	Occultation of Enceladus by Saturn
12, 13:36 → 15:47	Eclipse of Enceladus by Saturn
12, 13:57 → 15:15	Occultation of Tethys by Saturn
12, 14:06 → 16:23	Eclipse of Tethys by Saturn
12, 23:39	Maximum of N. Taurids
13, 01:04	Minimum of eclipsing binary λ Tau
13, 02:02	Conjunction Venus-η Vir
13, 04:58 → 06:41	Occultation of Mimas by Saturn
13, 05:08 → 07:08	Eclipse of Mimas by Saturn
13, 05:46 → 07:26	Transit of Enceladus on top of Saturn
13, 05:59 → 08:11	Shadow transit of Enceladus on top of Saturn
13, 09:16	Conjunction Moon-Mars
13, 09:27	**New Moon**
13, 09:49	Minimum of eclipsing binary β Lyr
13, 13:29	Minimum of eclipsing binary β Per
13, 17:21	Opposition of Uranus (elongation 179.681°)
14, 12:12	Conjunction Moon-Mercury
14, 14:40 → 16:20	Transit of Enceladus on top of Saturn
14, 14:45 → 16:28	Transit of Mimas on top of Saturn
14, 14:53 → 17:04	Shadow transit of Enceladus on top of Saturn
14, 14:55 → 16:58	Shadow transit of Mimas on top of Saturn
14, 18:08	Conjunction Moon-σ Sco
14, 20:13 → 21:02	NGC6144 behind Moon
14, 20:13 → 21:02	IC4606 behind Moon
14, 21:27	Conjunction Moon-α Sco
15, 15:28 → 16:33	NGC6316 behind Moon
15, 23:33 → 16, 01:13	Transit of Enceladus on top of Saturn
15, 23:46 → 16, 01:58	Shadow transit of Enceladus on top of Saturn
16, 00:50 → 02:33	Occultation of Mimas by Saturn
16, 01:00 → 03:00	Eclipse of Mimas by Saturn
16, 10:18	Minimum of eclipsing binary β Per
16, 11:59 → 13:42	Transit of Mimas on top of Saturn
16, 12:10 → 14:12	Shadow transit of Mimas on top of Saturn
16, 14:01 → 15:18	Eclipse of Dione by Saturn
16, 14:45	Moon's minimum declination (-28.240°)
16, 16:49	Conjunction Moon-δ Sgr
16, 23:56	Minimum of eclipsing binary λ Tau
17, 03:12	Conjunction Mercury-α Sco
17, 07:13 → 08:33	Transit of Tethys on top of Saturn
17, 07:23 → 09:42	Shadow transit of Tethys on top of Saturn
17, 08:26 → 10:07	Transit of Enceladus on top of Saturn
17, 08:39 → 10:51	Shadow transit of Enceladus on top of Saturn
17, 08:41	Conjunction Moon-τ Sgr
17, 10:36 → 12:20	Transit of Mimas on top of Saturn
17, 10:47 → 12:50	Shadow transit of Mimas on top of Saturn
17, 22:04 → 23:48	Occultation of Mimas by Saturn
17, 22:15 → 18, 00:15	Eclipse of Mimas by Saturn
17, 22:51 → 18, 00:07	Shadow transit of Dione on top of Saturn
18, 05:11	Maximum of Leonids
18, 05:25	Conjunction of Mars (elongation 0.115°)
19, 07:07	Minimum of eclipsing binary β Per
19, 07:43 → 09:02	Eclipse of Dione by Saturn
19, 07:50 → 09:34	Transit of Mimas on top of Saturn
19, 08:01 → 10:04	Shadow transit of Mimas on top of Saturn
19, 09:49 → 11:31	Occultation of Enceladus by Saturn
19, 10:03 → 12:15	Eclipse of Enceladus by Saturn
20, 02:13 → 03:54	Transit of Enceladus on top of Saturn
20, 02:26 → 04:39	Shadow transit of Enceladus on top of Saturn
20, 03:11 → 04:33	Occultation of Tethys by Saturn
20, 03:21 → 05:41	Eclipse of Tethys by Saturn
20, 06:05	Lunar Transient Phenomena Lunar-X
20, 10:50	**Moon's first quarter**
20, 16:30	Conjunction Moon-Saturn
20, 17:56 → 19:41	Occultation of Mimas by Saturn
20, 18:07 → 20:08	Eclipse of Mimas by Saturn
20, 18:43 → 20:25	Occultation of Enceladus by Saturn
20, 18:56 → 21:08	Eclipse of Enceladus by Saturn
20, 22:48	Minimum of eclipsing binary λ Tau
21, 21:03	Moon's perigee (parallax = 59' 18.031")
22, 00:29 → 01:52	Occultation of Tethys by Saturn
22, 00:40 → 03:00	Eclipse of Tethys by Saturn
22, 01:24 → 02:45	Eclipse of Dione by Saturn
22, 03:36 → 05:18	Occultation of Enceladus by Saturn
22, 03:42 → 05:26	Transit of Mimas on top of Saturn
22, 03:50 → 06:02	Eclipse of Enceladus by Saturn
22, 03:53 → 05:56	Shadow transit of Mimas on top of Saturn
22, 03:56	Minimum of eclipsing binary β Per
22, 05:30	Maximum of α-Monocerotids
22, 08:45	Conjunction Moon-Neptune
23, 12:30 → 14:12	Occultation of Enceladus by Saturn
23, 12:43 → 14:56	Eclipse of Enceladus by Saturn
23, 13:48 → 15:33	Occultation of Mimas by Saturn
23, 13:59 → 16:01	Eclipse of Mimas by Saturn
24, 19:05 → 20:29	Eclipse of Dione by Saturn
24, 20:27 → 21:52	Transit of Tethys on top of Saturn
24, 20:39 → 22:59	Shadow transit of Tethys on top of Saturn
24, 21:23 → 23:06	Occultation of Enceladus by Saturn
24, 21:37 → 23:49	Eclipse of Enceladus by Saturn
24, 21:41	Minimum of eclipsing binary λ Tau
24, 23:33 → 25, 01:18	Transit of Mimas on top of Saturn
24, 23:44 → 25, 01:48	Shadow transit of Mimas on top of Saturn
25, 00:45	Minimum of eclipsing binary β Per
25, 04:23	Conjunction Mercury-θ Oph
25, 10:14	Conjunction Moon-Jupiter
26, 08:24	Minimum of eclipsing binary β Lyr
26, 09:10	Conjunction Moon-Uranus
26, 20:47 → 22:33	Transit of Mimas on top of Saturn
26, 20:59 → 23:03	Shadow transit of Mimas on top of Saturn
26, 22:39 → 27, 00:22	Transit of Enceladus on top of Saturn
26, 22:53 → 27, 01:06	Shadow transit of Enceladus on top of Saturn
27, 09:16	Full Moon
27, 15:10 → 16:53	Occultation of Enceladus by Saturn
27, 15:24 → 17:36	Eclipse of Enceladus by Saturn
27, 16:25 → 17:52	Occultation of Tethys by Saturn
27, 16:37 → 18:58	Eclipse of Tethys by Saturn
27, 21:34	Minimum of eclipsing binary β Per
28, 06:55 → 08:41	Occultation of Mimas by Saturn
28, 07:06 → 09:08	Eclipse of Mimas by Saturn
28, 07:33 → 09:16	Transit of Enceladus on top of Saturn
28, 07:47 → 10:00	Shadow transit of Enceladus on top of Saturn
28, 20:05	Maximum of Nov. Orionids
28, 20:33	Minimum of eclipsing binary λ Tau
29, 14:08	Moon's maximum declination (28.193°)
29, 16:26 → 18:10	Transit of Enceladus on top of Saturn
29, 16:39 → 18:25	Transit of Mimas on top of Saturn
29, 16:40 → 18:54	Shadow transit of Enceladus on top of Saturn
29, 16:50 → 18:54	Shadow transit of Mimas on top of Saturn
29, 17:40	Conjunction Venus-α Vir
30, 00:24	Conjunction Mars-ω_1 Sco
30, 18:23	Minimum of eclipsing binary β Per

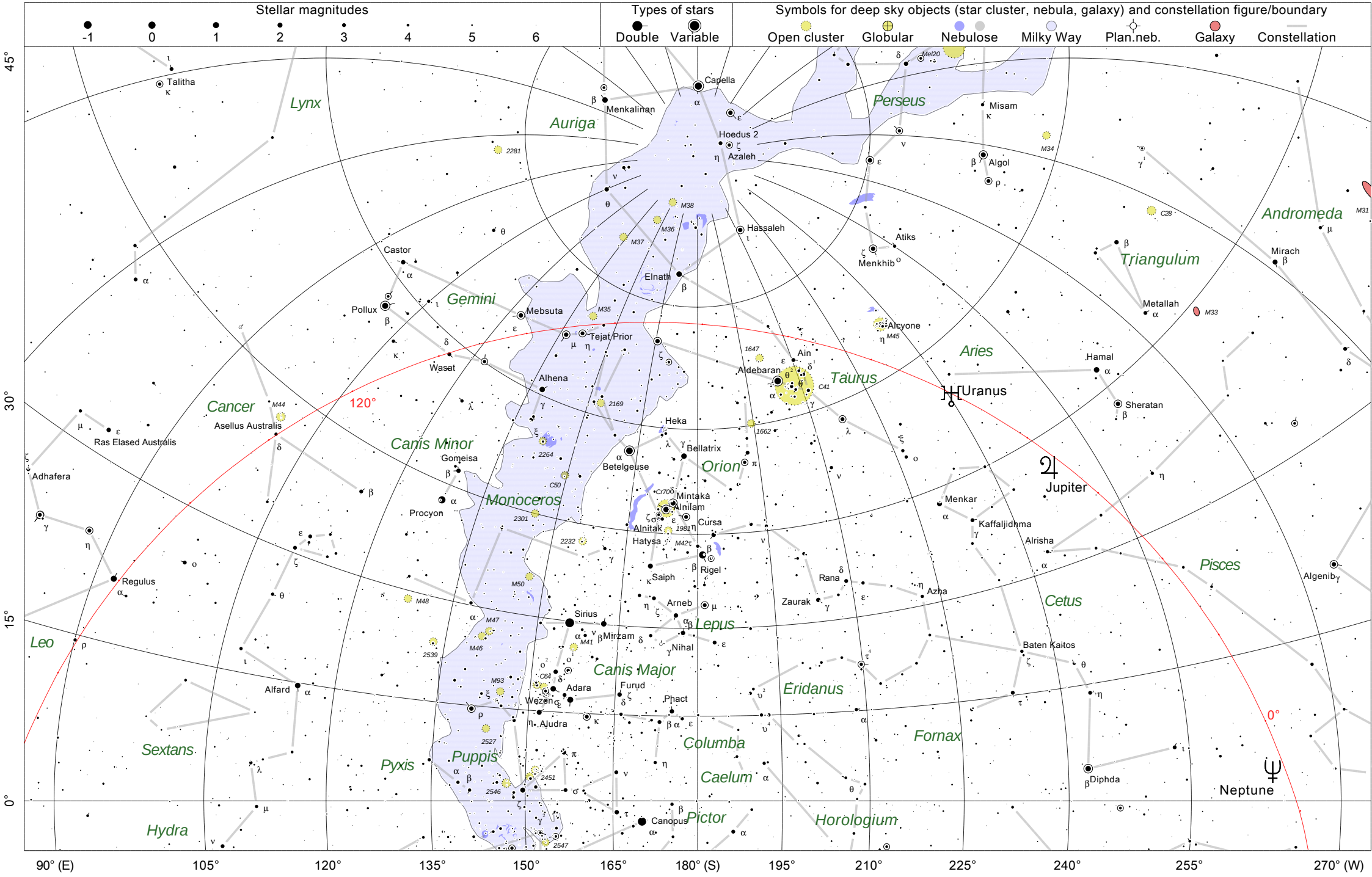
Sky on November 15, 2023, 00:00 h (UT)



Astronomical events for December

Date (UT)	Event description
1, 01:19 → 03:04	Transit of Enceladus on top of Saturn
1, 01:33 → 03:47	Shadow transit of Enceladus on top of Saturn
1, 02:47 → 04:34	Occultation of Mimas by Saturn
1, 02:58 → 05:01	Eclipse of Mimas by Saturn
1, 03:03	Conjunction Moon-β Gem
1, 13:53 → 15:40	Transit of Mimas on top of Saturn
1, 14:05 → 16:09	Shadow transit of Mimas on top of Saturn
1, 15:18 → 16:44	Shadow transit of Dione on top of Saturn
2, 09:41 → 11:11	Transit of Tethys on top of Saturn
2, 09:54 → 12:16	Shadow transit of Tethys on top of Saturn
2, 10:10 → 12:31	Transit of Europa on top of Jupiter
2, 10:13 → 11:57	Transit of Enceladus on top of Saturn
2, 10:27 → 12:41	Shadow transit of Enceladus on top of Saturn
2, 11:36 → 14:00	Shadow transit of Europa on top of Jupiter
2, 12:30 → 14:18	Transit of Mimas on top of Saturn
2, 12:42 → 14:46	Shadow transit of Mimas on top of Saturn
2, 13:42 → 15:55	Occultation of Io by Jupiter
2, 14:25 → 16:39	Eclipse of Io by Jupiter
2, 18:51	Maximum of Phoenicids
2, 19:25	Minimum of eclipsing binary λ Tau
3, 00:02 → 01:49	Occultation of Mimas by Saturn
3, 00:10 → 01:39	Eclipse of Dione by Saturn
3, 00:13 → 02:16	Eclipse of Mimas by Saturn
3, 15:12	Minimum of eclipsing binary β Per
3, 22:41	Conjunction Moon-η Leo
4, 04:29 → 06:52	Occultation of Europa by Jupiter
4, 05:47	Conjunction Moon-α Leo
4, 06:02 → 08:28	Eclipse of Europa by Jupiter
4, 07:00 → 08:31	Transit of Tethys on top of Saturn
4, 07:13 → 09:35	Shadow transit of Tethys on top of Saturn
4, 08:08 → 10:21	Occultation of Io by Jupiter
4, 08:54 → 11:08	Eclipse of Io by Jupiter
4, 08:59 → 10:28	Shadow transit of Dione on top of Saturn
4, 09:45 → 11:33	Transit of Mimas on top of Saturn
4, 09:56 → 12:01	Shadow transit of Mimas on top of Saturn
4, 11:37 → 13:23	Occultation of Enceladus by Saturn
4, 11:51 → 14:05	Eclipse of Enceladus by Saturn
4, 14:36	Maximum elongation of Mercury (21.272° E)
4, 18:42	Moon's apogee (parallax = 54' 13.742")
4, 19:42 → 19:50	NGC3351 (M95) behind Moon
5, 03:59 → 05:45	Transit of Enceladus on top of Saturn
5, 04:14 → 06:28	Shadow transit of Enceladus on top of Saturn
5, 05:39 → 07:11	Occultation of Tethys by Saturn
5, 05:49	**Moon's last quarter**
5, 05:52 → 08:15	Eclipse of Tethys by Saturn
5, 05:58	Lunar Transient Phenomena Lunar-X
5, 19:54 → 21:42	Occultation of Mimas by Saturn
5, 20:05 → 22:08	Eclipse of Mimas by Saturn
5, 20:30 → 22:16	Occultation of Enceladus by Saturn
5, 20:44 → 22:58	Eclipse of Enceladus by Saturn
5, 23:19 → 6, 01:40	Transit of Europa on top of Jupiter
6, 00:53 → 03:17	Shadow transit of Europa on top of Jupiter
6, 02:35 → 04:48	Occultation of Io by Jupiter
6, 03:23 → 05:36	Eclipse of Io by Jupiter
6, 12:01	Minimum of eclipsing binary β Per
6, 12:31	Conjunction Moon-β Vir
6, 18:17	Minimum of eclipsing binary λ Tau
7, 00:45 → 01:40	η Vir behind Moon
7, 02:40 → 04:11	Shadow transit of Dione on top of Saturn
7, 02:58 → 04:32	Occultation of Tethys by Saturn
7, 03:11 → 05:34	Eclipse of Tethys by Saturn
7, 05:23 → 07:10	Occultation of Enceladus by Saturn
7, 05:36 → 07:25	Transit of Mimas on top of Saturn
7, 05:38 → 07:52	Eclipse of Enceladus by Saturn
7, 05:48 → 07:53	Shadow transit of Mimas on top of Saturn
7, 17:07	Maximum of Puppid-Velids
7, 17:39 → 20:02	Occultation of Europa by Jupiter
7, 19:21 → 21:47	Eclipse of Europa by Jupiter
7, 21:02 → 23:15	Occultation of Io by Jupiter
7, 21:52 → 8, 00:05	Eclipse of Io by Jupiter
8, 01:37 → 03:12	Transit of Tethys on top of Saturn
8, 01:51 → 04:14	Shadow transit of Tethys on top of Saturn
8, 04:14 → 06:03	Transit of Mimas on top of Saturn
8, 04:25 → 06:31	Shadow transit of Mimas on top of Saturn
8, 07:14	Conjunction Mercury-λ Sgr
8, 14:17 → 16:04	Occultation of Enceladus by Saturn
8, 14:31 → 16:45	Eclipse of Enceladus by Saturn
8, 14:35	Conjunction Mars-α Sco
8, 15:46 → 17:35	Occultation of Mimas by Saturn
8, 15:57 → 18:01	Eclipse of Mimas by Saturn
8, 16:56	Conjunction Moon-α Vir
9, 00:16 → 01:52	Occultation of Tethys by Saturn
9, 00:30 → 02:54	Eclipse of Tethys by Saturn
9, 02:51 → 04:40	Transit of Mimas on top of Saturn
9, 03:02 → 05:08	Shadow transit of Mimas on top of Saturn
9, 06:59	Minimum of eclipsing binary β Lyr
9, 08:50	Minimum of eclipsing binary β Per
9, 12:28 → 14:50	Transit of Europa on top of Jupiter
9, 14:11 → 16:35	Shadow transit of Europa on top of Jupiter
9, 15:26	Conjunction Moon-Venus
9, 15:28 → 17:41	Occultation of Io by Jupiter
9, 16:20 → 18:34	Eclipse of Io by Jupiter
9, 16:22	Maximum of Monocerotids
9, 16:22	Maximum of σ-Hydrids
9, 22:56 → 10, 00:32	Transit of Tethys on top of Saturn
9, 23:10 → 10, 01:33	Shadow transit of Tethys on top of Saturn
9, 23:10 → 10, 00:58	Occultation of Enceladus by Saturn
9, 23:25 → 10, 01:39	Eclipse of Enceladus by Saturn
10, 01:28 → 03:18	Transit of Mimas on top of Saturn
10, 01:39 → 03:45	Shadow transit of Mimas on top of Saturn
10, 17:10	Minimum of eclipsing binary λ Tau
10, 21:35 → 23:12	Occultation of Tethys by Saturn
10, 21:47 → 22:27	NGC5897 behind Moon
10, 21:49 → 11, 00:13	Eclipse of Tethys by Saturn
11, 00:05 → 01:55	Transit of Mimas on top of Saturn
11, 00:17 → 02:23	Shadow transit of Mimas on top of Saturn
11, 06:50 → 09:13	Occultation of Europa by Jupiter
11, 08:41 → 11:07	Eclipse of Europa by Jupiter
11, 09:55 → 12:08	Occultation of Io by Jupiter
11, 10:49 → 13:03	Eclipse of Io by Jupiter
11, 20:14 → 21:52	Transit of Tethys on top of Saturn
11, 20:29 → 22:52	Shadow transit of Tethys on top of Saturn
11, 22:42 → 12, 00:33	Transit of Mimas on top of Saturn
11, 22:54 → 12, 01:00	Shadow transit of Mimas on top of Saturn
12, 00:26 → 02:15	Transit of Enceladus on top of Saturn
12, 00:41 → 02:56	Shadow transit of Enceladus on top of Saturn
12, 01:01	Conjunction Moon-σ Sco
12, 03:57	Conjunction Moon-α Sco
12, 05:38	Minimum of eclipsing binary β Per
12, 06:47	Conjunction Moon-Mars
12, 16:57 → 18:46	Occultation of Enceladus by Saturn
12, 17:11 → 19:26	Eclipse of Enceladus by Saturn
12, 18:54 → 20:32	Occultation of Tethys by Saturn
12, 19:08 → 21:32	Eclipse of Tethys by Saturn
12, 21:19 → 23:10	Transit of Mimas on top of Saturn
12, 21:31 → 23:37	Shadow transit of Mimas on top of Saturn
12, 23:32	**New Moon**
12, 23:51 → 13, 01:50	Eclipse of Ganymede by Jupiter
13, 01:38 → 04:00	Transit of Europa on top of Jupiter
13, 03:29 → 05:53	Shadow transit of Europa on top of Jupiter
13, 04:22 → 06:35	Occultation of Io by Jupiter
13, 05:18 → 07:31	Eclipse of Io by Jupiter
13, 08:53 → 10:43	Occultation of Mimas by Saturn
13, 09:04 → 11:08	Eclipse of Mimas by Saturn
13, 09:20 → 11:09	Transit of Enceladus on top of Saturn
13, 09:34 → 11:49	Shadow transit of Enceladus on top of Saturn
13, 17:33 → 19:12	Transit of Tethys on top of Saturn
13, 17:48 → 20:12	Shadow transit of Tethys on top of Saturn
13, 19:57 → 21:48	Transit of Mimas on top of Saturn
13, 20:08 → 22:14	Shadow transit of Mimas on top of Saturn
13, 21:51	Moon's minimum declination (-28.153°)
14, 04:01	Conjunction Moon-Mercury
14, 16:02	Minimum of eclipsing binary λ Tau
14, 16:12 → 17:53	Occultation of Tethys by Saturn
14, 16:27 → 18:51	Eclipse of Tethys by Saturn
14, 18:13 → 20:03	Transit of Enceladus on top of Saturn
14, 18:28 → 20:43	Shadow transit of Enceladus on top of Saturn
14, 18:34 → 20:25	Transit of Mimas on top of Saturn
14, 18:36	Conjunction Moon-τ Sgr
14, 18:45 → 20:52	Shadow transit of Mimas on top of Saturn
14, 19:06	**Maximum of Geminids**
14, 20:01 → 22:25	Occultation of Europa by Jupiter
14, 22:00 → 15, 00:26	Eclipse of Europa by Jupiter
14, 22:49 → 15, 01:02	Occultation of Io by Jupiter
14, 23:47 → 15, 02:00	Eclipse of Io by Jupiter
15, 02:27	Minimum of eclipsing binary β Per
15, 06:08 → 07:59	Occultation of Mimas by Saturn
15, 06:19 → 08:23	Eclipse of Mimas by Saturn
15, 07:45 → 09:21	Shadow transit of Dione on top of Saturn
15, 14:52 → 16:33	Transit of Tethys on top of Saturn
15, 15:06 → 17:31	Shadow transit of Tethys on top of Saturn
15, 17:11 → 19:03	Transit of Mimas on top of Saturn
15, 17:22 → 19:29	Shadow transit of Mimas on top of Saturn
16, 03:07 → 04:57	Transit of Enceladus on top of Saturn
16, 03:21 → 05:36	Shadow transit of Enceladus on top of Saturn
16, 04:45 → 06:36	Occultation of Mimas by Saturn
16, 04:56 → 07:01	Eclipse of Mimas by Saturn
16, 13:31 → 15:13	Occultation of Tethys by Saturn
16, 13:33	Maximum of Comae Berenic.
16, 13:46 → 16:11	Eclipse of Tethys by Saturn
16, 14:03 → 16:00	Shadow transit of Ganymede on top of Jupiter
16, 14:49 → 17:11	Transit of Europa on top of Jupiter
16, 15:48 → 17:41	Transit of Mimas on top of Saturn
16, 16:00 → 18:07	Shadow transit of Mimas on top of Saturn
16, 16:37 → 18:15	Eclipse of Dione by Saturn
16, 16:47 → 19:11	Shadow transit of Europa on top of Jupiter
16, 17:16 → 19:29	Occultation of Io by Jupiter
16, 18:16 → 20:29	Eclipse of Io by Jupiter
16, 18:53	Moon's perigee (parallax = 59' 36.797")
17, 12:00 → 13:51	Transit of Enceladus on top of Saturn
17, 12:10 → 13:53	Transit of Tethys on top of Saturn
17, 12:14 → 14:30	Shadow transit of Enceladus on top of Saturn
17, 12:25 → 14:50	Shadow transit of Tethys on top of Saturn
17, 14:26 → 16:18	Transit of Mimas on top of Saturn
17, 14:37 → 16:44	Shadow transit of Mimas on top of Saturn
17, 23:16	Minimum of eclipsing binary β Per
18, 01:03	Conjunction Moon-Saturn
18, 01:26 → 03:04	Shadow transit of Dione on top of Saturn
18, 02:00 → 03:52	Occultation of Mimas by Saturn
18, 02:11 → 04:16	Eclipse of Mimas by Saturn
18, 09:13 → 11:38	Occultation of Europa by Jupiter
18, 10:50 → 12:33	Occultation of Tethys by Saturn
18, 11:05 → 13:30	Eclipse of Tethys by Saturn
18, 11:19 → 13:45	Eclipse of Europa by Jupiter
18, 11:43 → 13:56	Occultation of Io by Jupiter
18, 12:44 → 14:58	Eclipse of Io by Jupiter
18, 13:03 → 14:56	Transit of Mimas on top of Saturn
18, 13:14 → 15:21	Shadow transit of Mimas on top of Saturn
18, 14:54	Minimum of eclipsing binary λ Tau
18, 23:59	Asteroid
19, 09:29 → 11:13	Transit of Tethys on top of Saturn
19, 09:44 → 12:09	Shadow transit of Tethys on top of Saturn
19, 10:19 → 11:59	Eclipse of Dione by Saturn
19, 11:40 → 13:33	Transit of Mimas on top of Saturn
19, 11:51 → 13:58	Shadow transit of Mimas on top of Saturn
19, 13:25 → 15:16	Occultation of Enceladus by Saturn
19, 13:39 → 15:54	Eclipse of Enceladus by Saturn
19, 14:01	Conjunction Moon-Neptune
19, 18:39	**Moon's first quarter**
19, 19:57	Lunar Transient Phenomena Lunar-X
20, 03:54 → 05:52	Eclipse of Ganymede by Jupiter
20, 04:00 → 06:23	Transit of Europa on top of Jupiter
20, 05:47 → 07:39	Transit of Enceladus on top of Saturn
20, 06:01 → 08:17	Shadow transit of Enceladus on top of Saturn
20, 06:05 → 08:29	Shadow transit of Europa on top of Jupiter
20, 06:10 → 08:23	Occultation of Io by Jupiter
20, 07:13 → 09:27	Eclipse of Io by Jupiter
20, 08:08 → 09:54	Occultation of Tethys by Saturn
20, 08:24 → 10:49	Eclipse of Tethys by Saturn
20, 10:17 → 12:11	Transit of Mimas on top of Saturn
20, 10:28 → 12:36	Shadow transit of Mimas on top of Saturn
20, 11:52	Maximum of Dic. L. Minorids
20, 18:58	Conjunction Mercury-μ Sgr
20, 20:05	Minimum of eclipsing binary β Per
20, 21:52 → 23:45	Occultation of Mimas by Saturn

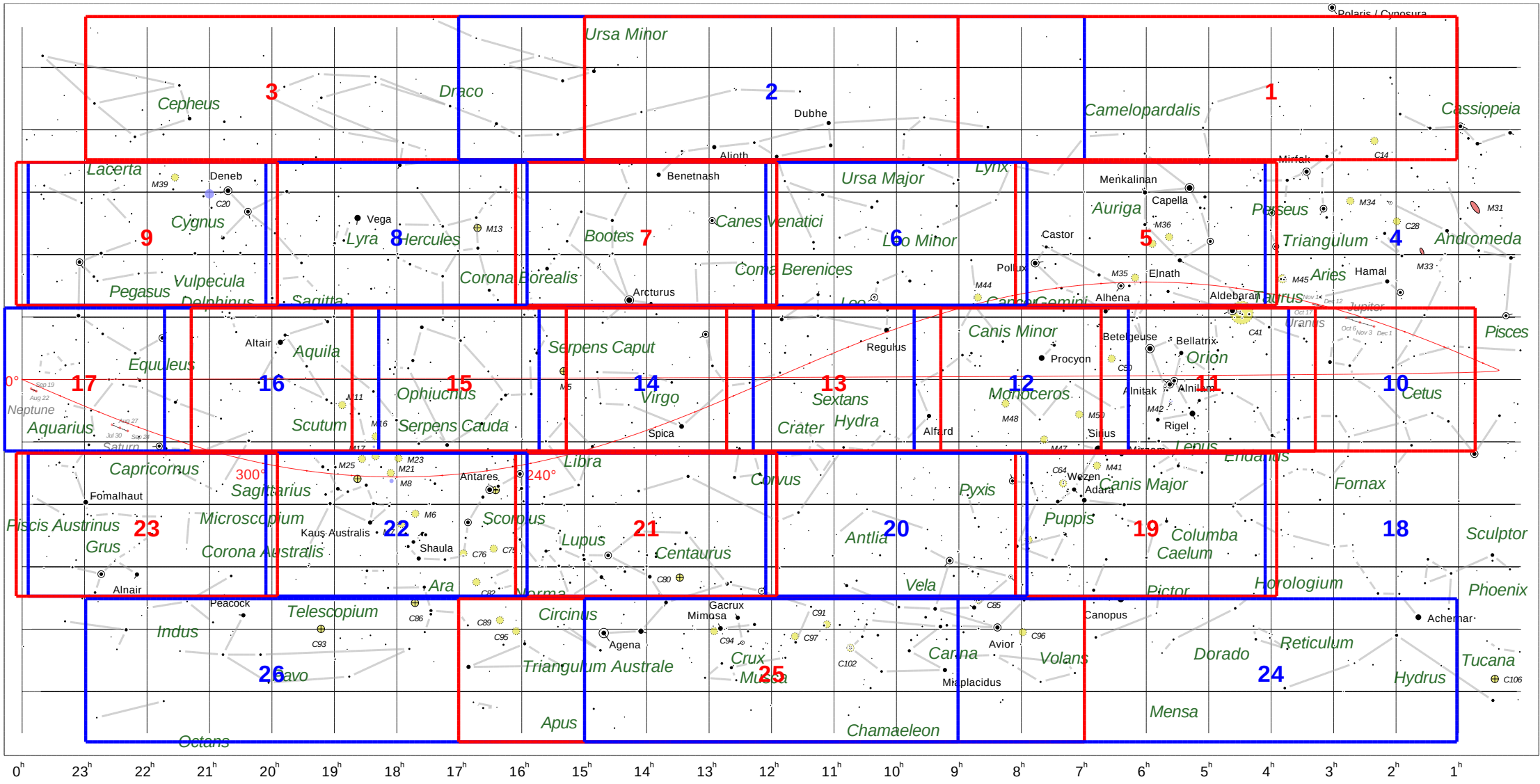
Sky on December 15, 2023, 00:00 h (UT)



Sky atlas, J2023 epoch

Chart	Central right ascension (h)	Central declination (°)	Constellations
1	4	70	Camelopardalis, Cassiopeia, Cepheus, Ursa Major, Ursa Minor
2	12	70	Draco, Ursa Major, Ursa Minor, Camelopardalis, Cepheus
3	20	70	Draco, Cepheus, Cygnus, Cassiopeia, Ursa Minor
4	2	35	Triangulum, Andromeda, Perseus, Pisces, Aries
5	6	35	Auriga, Gemini, Taurus, Orion, Lynx
6	10	35	Leo Minor, Ursa Major, Lynx, Cancer, Canes Venatici
7	14	35	Canes Venatici, Bootes, Ursa Major, Coma Berenices, Corona Borealis
8	18	35	Hercules, Lyra, Cygnus, Draco, Corona Borealis
9	22	35	Pegasus, Lacerta, Cygnus, Vulpecula, Andromeda
10	2	0	Cetus, Pisces, Aries, Taurus, Fornax
11	5	0	Orion, Eridanus, Taurus, Lepus, Monoceros
12	8	0	Canis Minor, Hydra, Monoceros, Cancer, Puppis
13	11	0	Leo, Sextans, Virgo, Crater, Coma Berenices
14	14	0	Virgo, Bootes, Libra, Serpens Caput, Coma Berenices
15	17	0	Ophiuchus, Hercules, Serpens Caput, Scorpius, Serpens Cauda
16	20	0	Aquila, Aquarius, Delphinus, Sagittarius, Pegasus
17	23	0	Pisces, Pegasus, Aquarius, Cetus, Capricornus
18	2	-35	Fornax, Sculptor, Phoenix, Cetus, Eridanus
19	6	-35	Columba, Canis Major, Puppis, Lepus, Caelum
20	10	-35	Antlia, Hydra, Pyxis, Vela, Crater
21	14	-35	Centaurus, Hydra, Lupus, Libra, Virgo
22	18	-35	Sagittarius, Scorpius, Corona Australis, Ophiuchus, Ara
23	22	-35	Piscis Austrinus, Grus, Sculptor, Aquarius, Capricornus
24	4	-70	Hydrus, Mensa, Dorado, Reticulum, Volans
25	12	-70	Musca, Carina, Circinus, Centaurus, Chamaeleon
26	20	-70	Pavo, Octans, Indus, Telescopium, Triangulum Australe

Atlas layout



Main objects visible on chart 1

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
Sh2-155 CALDWELL 9 - Cave nebula	22h 58m 12.8s	+62° 45' 57"		Nebula	50.4 x 30.0
NGC7635 CALDWELL 11 - Bubble nebula	23h 21m 46.3s	+61° 20' 16"		Nebula	15.0 x 8.0
Mel20 - Alpha Persei cluster	03h 23m 38.1s	+49° 04' 52"	1.2	Open cluster	3.08°
Stock2	02h 16m 03.5s	+59° 22' 23"	4.4	Open cluster	60.0
NGC869 CALDWELL 14 - Double cluster	02h 20m 42.0s	+57° 14' 24"	5.3	Open cluster	18.0
NGC884	02h 23m 43.6s	+57° 14' 02"	6.1	Open cluster	18.0
NGC7160	21h 54m 19.9s	+62° 42' 45"	6.1	Open cluster	5.0
NGC1545	04h 22m 40.6s	+50° 18' 31"	6.2	Open cluster	12.0
NGC457 CALDWELL 13 - Owl cluster	01h 21m 00.8s	+58° 24' 55"	6.4	Open cluster	20.0
NGC1528	04h 17m 04.1s	+51° 16' 04"	6.4	Open cluster	18.0
NGC129	00h 31m 15.9s	+60° 20' 19"	6.5	Open cluster	12.0
NGC654	01h 45m 35.6s	+61° 59' 52"	6.5	Open cluster	6.0
IC1805	02h 34m 33.9s	+61° 33' 43"	6.5	Open cluster	20.0
IC1848	02h 53m 05.7s	+60° 30' 07"	6.5	Open cluster	18.0
NGC1444	03h 51m 09.8s	+52° 43' 25"	6.6	Open cluster	4.0
NGC1027	02h 44m 24.0s	+61° 41' 31"	6.7	Open cluster	15.0
NGC7789	23h 58m 38.9s	+56° 50' 33"	6.7	Open cluster	25.0
NGC1502	04h 09m 51.8s	+62° 23' 29"	6.9	Open cluster	20.0
NGC3031 M81 - Bode's nebulae	09h 57m 25.3s	+68° 57' 26"	6.9	Galaxy	24.9 x 11.5
NGC7654 M52	23h 25m 50.1s	+61° 43' 36"	6.9	Open cluster	16.0
NGC225	00h 44m 57.7s	+61° 53' 32"	7.0	Open cluster	15.0
NGC663 CALDWELL 10	01h 47m 53.0s	+61° 19' 58"	7.1	Open cluster	15.0
Tr3	03h 13m 44.1s	+63° 16' 07"	7.2	Open cluster	23.0
NGC581 M103	01h 34m 55.6s	+60° 46' 33"	7.4	Open cluster	6.0
NGC957	02h 35m 01.9s	+57° 39' 36"	7.6	Open cluster	10.0
NGC659	01h 45m 59.0s	+60° 47' 05"	7.9	Open cluster	6.0
NGC744	02h 00m 06.0s	+55° 35' 04"	7.9	Open cluster	5.0
NGC7510	23h 12m 03.5s	+60° 41' 39"	7.9	Open cluster	7.0
NGC188 CALDWELL 1	00h 49m 60.0s	+85° 23' 01"	8.1	Open cluster	15.0
NGC637	01h 44m 41.4s	+64° 09' 06"	8.2	Open cluster	3.0
NGC1513	04h 11m 39.8s	+49° 34' 25"	8.4	Open cluster	12.0
NGC3034 M82	09h 57m 47.1s	+69° 34' 23"	8.4	Galaxy	11.2 x 4.3
IC342 CALDWELL 5	03h 49m 03.3s	+68° 09' 55"	8.4	Galaxy	21.4 x 20.9
NGC2403 CALDWELL 7	07h 39m 02.9s	+65° 32' 55"	8.5	Galaxy	23.4 x 11.8
NGC7790	23h 59m 34.7s	+61° 20' 11"	8.5	Open cluster	5.0
King14	00h 33m 13.4s	+63° 17' 36"	8.5	Open cluster	7.0
Stock4	01h 54m 33.4s	+57° 10' 45"	8.6	Open cluster	20.0
NGC189	00h 40m 56.1s	+61° 13' 16"	8.8	Open cluster	5.0
NGC436	01h 17m 25.4s	+58° 55' 57"	8.8	Open cluster	5.0
Tr1	01h 37m 15.7s	+61° 24' 01"	8.9	Open cluster	4.5
NGC433	01h 16m 37.4s	+60° 14' 49"	9.0	Open cluster	4.0
NGC146	00h 34m 22.7s	+63° 25' 42"	9.1	Open cluster	5.0
NGC185 CALDWELL 18	00h 40m 14.3s	+48° 27' 48"	9.2	Galaxy	8.0 x 7.0
King19	23h 09m 16.7s	+60° 38' 29"	9.2	Open cluster	7.0
NGC381	01h 09m 47.6s	+61° 42' 20"	9.3	Open cluster	7.0
King12	23h 54m 09.1s	+62° 05' 41"	9.3	Open cluster	2.0
NGC133	00h 32m 37.3s	+63° 28' 42"	9.4	Open cluster	3.0
NGC7788	23h 57m 56.1s	+61° 31' 41"	9.4	Open cluster	4.0
NGC559 CALDWELL 8	01h 31m 05.2s	+63° 25' 12"	9.5	Open cluster	7.0
NGC1496	04h 06m 17.9s	+52° 43' 22"	9.6	Open cluster	3.0
NGC103	00h 26m 34.4s	+61° 26' 57"	9.8	Open cluster	5.0
Stock19	00h 05m 35.7s	+56° 09' 41"	9.8	Open cluster	3.0 x 1.0
Stock24	00h 41m 02.9s	+62° 04' 34"	9.8	Open cluster	6.0
NGC2768	09h 13m 23.6s	+59° 56' 28"	9.9	Galaxy	6.4 x 3.0
NGC3077	10h 05m 09.1s	+68° 37' 23"	9.9	Galaxy	5.2 x 4.7
NGC7762	23h 51m 07.6s	+68° 09' 59"	10.0	Open cluster	15.0
NGC110	00h 28m 47.3s	+71° 31' 04"	10.0	Open cluster	19.0
NGC366	01h 07m 53.5s	+62° 21' 05"	10.0	Open cluster	4.0
NGC657	01h 45m 00.5s	+55° 59' 24"	10.0	Open cluster	7.0
NGC743	02h 00m 14.5s	+60° 16' 40"	10.0	Open cluster	7.0
NGC650 M76 - Little Dumbbell	01h 43m 45.7s	+51° 41' 12"	10.1	Planetary nebula	3.1
NGC2655	08h 58m 33.6s	+78° 08' 03"	10.1	Galaxy	4.9 x 4.1
King16	00h 45m 05.0s	+64° 18' 32"	10.1	Open cluster	3.0
King21	23h 51m 02.2s	+62° 50' 41"	10.1	Open cluster	2.5
NGC2126	06h 04m 20.1s	+49° 51' 50"	10.2	Open cluster	6.0
NGC2976	09h 49m 06.5s	+67° 48' 36"	10.2	Galaxy	5.9 x 2.7
NGC2336	07h 30m 58.2s	+80° 07' 45"	10.4	Galaxy	7.1 x 3.9
NGC2985	09h 52m 23.1s	+72° 10' 13"	10.4	Galaxy	4.6 x 3.4
IC10	00h 21m 40.0s	+59° 25' 12"	10.4	Galaxy	6.4 x 5.3
NGC2146	06h 22m 17.5s	+78° 20' 40"	10.6	Galaxy	5.4 x 2.9
IC356	04h 10m 11.1s	+69° 52' 18"	10.6	Galaxy	5.9 x 3.9

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
IC2149	05h 58m 06.6s	+46° 06' 25"	10.6	Planetary nebula	34.2"
NGC2787	09h 21m 20.9s	+69° 06' 19"	10.7	Galaxy	3.1 x 1.8
NGC278	00h 53m 22.9s	+47° 40' 32"	10.8	Galaxy	2.1 x 2.0
NGC609	01h 38m 01.1s	+64° 39' 12"	11.0	Open cluster	3.0
NGC1569	04h 33m 00.6s	+64° 53' 46"	11.0	Galaxy	3.7 x 1.8
NGC1961	05h 44m 36.1s	+69° 23' 16"	11.0	Galaxy	4.5 x 3.1
NGC2300	07h 39m 42.9s	+85° 39' 25"	11.0	Galaxy	2.8 x 2.0
NGC2805	09h 22m 11.5s	+64° 00' 15"	11.0	Galaxy	6.3 x 4.8
NGC886	02h 25m 15.7s	+63° 52' 29"	11.0	Open cluster	14.0
NGC1708	05h 05m 17.1s	+52° 51' 51"	11.0	Open cluster	20.0
NGC40 CALDWELL 2 - Bow-tie nebula	00h 14m 17.6s	+72° 39' 01"	12.3	Planetary nebula	1.2

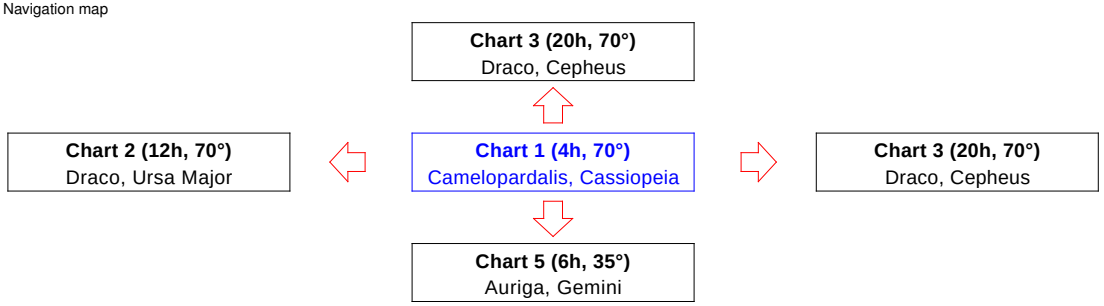
Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
STF 60 AB (Achird)	00h 51m 48.9s	+58° 03' 55"	3.52 / 7.36	13.4 / 326
STF 60 AH	00h 51m 48.9s	+58° 03' 55"	3.52 / 8.41	701.1 / 355
S 459 AB (β Cam)	05h 07m 31.9s	+60° 30' 09"	4.12 / 7.44	84.2 / 209
STF 262 AD	02h 32m 56.3s	+67° 36' 18"	4.63 / 8.48	210.9 / 60
SHJ 355 AC	23h 32m 10.8s	+58° 48' 11"	4.87 / 7.23	75.0 / 269
H 3 23 AC	01h 23m 01.2s	+58° 28' 18"	5.07 / 7.04	132.8 / 235
STFA 13 AB (11 Cam)	05h 10m 09.1s	+59° 01' 48"	5.20 / 6.21	177.7 / 10
STF 331	03h 04m 10.6s	+52° 31' 51"	5.21 / 6.17	12.0 / 86
S 514 AC	06h 30m 49.6s	+58° 23' 07"	5.38 / 7.92	94.9 / 272
WEB 2 AD	03h 46m 33.0s	+60° 06' 43"	5.72 / 8.45	54.8 / 37
S 823 AC	23h 11m 43.2s	+59° 34' 59"	5.72 / 8.16	167.2 / 163
STF 1062 AB (19 Lyn)	07h 26m 36.0s	+55° 11' 20"	5.76 / 6.71	13.8 / 317
STF 1062 AD	07h 26m 36.0s	+55° 11' 20"	5.76 / 7.57	215.3 / 6
ARN 32 AE	01h 46m 29.8s	+60° 46' 52"	5.78 / 7.12	316.8 / 268
STF 550 AB (1 Cam)	04h 35m 42.0s	+54° 00' 17"	5.78 / 6.82	10.4 / 309
S 838 AD	00h 06m 38.2s	+62° 32' 38"	5.92 / 8.24	244.0 / 197
STF 3053 AB	00h 04m 59.8s	+66° 21' 18"	5.96 / 7.17	15.2 / 70
BUP 91 AC	06h 41m 53.8s	+61° 26' 13"	6.04 / 6.99	397.2 / 92
SHJ 86 AB	08h 06m 35.8s	+62° 57' 28"	6.15 / 7.53	51.6 / 81
STF 2893	22h 13m 41.8s	+73° 32' 10"	6.19 / 7.91	28.9 / 348
STF 396 AB	03h 37m 15.5s	+58° 54' 59"	6.43 / 7.68	20.5 / 245
S 436	03h 53m 02.1s	+57° 15' 17"	6.46 / 7.17	58.3 / 77
S 405 AB	02h 18m 21.9s	+79° 54' 14"	6.47 / 7.15	55.7 / 278
STTA 25 (V551 Per)	02h 20m 07.6s	+57° 15' 58"	6.52 / 7.41	102.8 / 205

Main variable stars

Name	RA (J2023)	DEC	Magnitude	Maximum / Period (d)	Type
Cih (γ Cas)	00h 58m 07.0s	+60° 50' 27"	1.6 / 3.0		Er - γ Cas
U Cep	01h 04m 28.7s	+81° 59' 55"	6.75 / 9.24	2.49	Ecl - Algol
SZ Cam	04h 09m 51.9s	+62° 23' 33"	7.0 / 7.29	2.70	Ecl - Algol
RX Cam	04h 06m 53.6s	+58° 43' 15"	7.30 / 8.07	7.91	P - δ Cep
AA Cam	07h 17m 17.7s	+68° 45' 45"	9.0 / 9.6		P - Irr Superg
S Cam	05h 43m 32.2s	+68° 48' 31"	7.7 / 11.6	Apr 28 / 327.26	P - Semi-irr
RU Cam	07h 24m 12.3s	+69° 37' 31"	8.10 / 9.79	22	P - δ Cep
RY Cam	04h 33m 00.5s	+64° 29' 23"	8.9 / 11.0	135.75	P - Semi-irr

Navigation map



Stellar magnitudes

-1 0 1 2 3 4 5 6 7 8

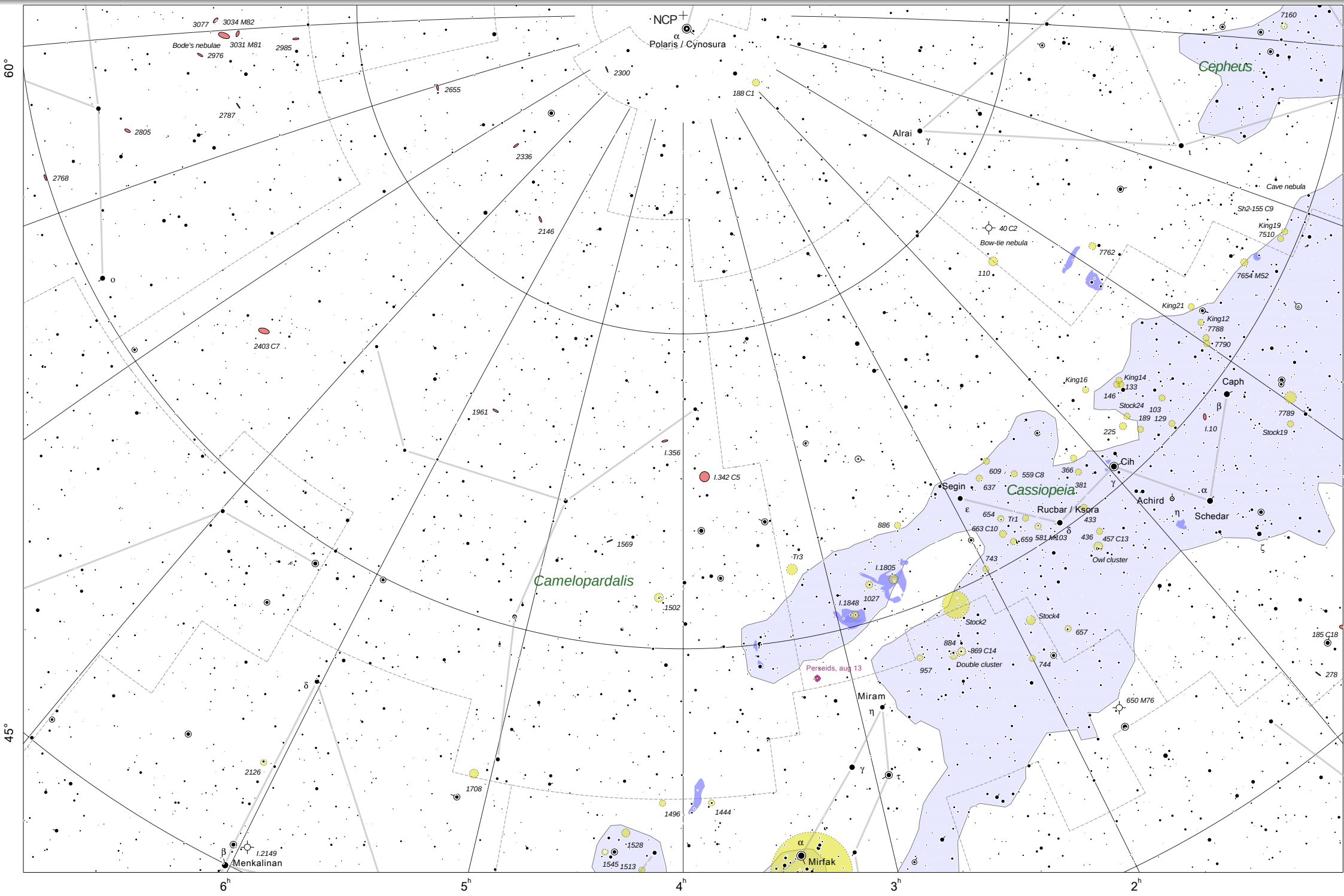
Types of stars

Double Variable

Symbols for deep sky objects (star cluster, nebula, galaxy) and constellation figure/boundary

Open cluster Globular Nebulose Milky Way Plan.neb. Galaxy Constellation Const. limit Meteors

Chart 1, 30º around 4.0h, 70.0º (Camelopardalis, Cassiopeia, Cepheus, Ursa Major)



Main objects visible on chart 2

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
NGC3031 M81 - Bode's nebulae	09h 57m 25.3s	+68° 57' 26"	6.9	Galaxy	24.9 x 11.5
NGC5457 M101 - Pinwheel galaxy	14h 04m 01.2s	+54° 14' 22"	7.9	Galaxy	28.8 x 26.9
NGC6543 CALDWELL 6 - Cat eye nebula	17h 58m 33.0s	+66° 37' 58"	8.1	Planetary nebula	19.8"
NGC3034 M82	09h 57m 47.1s	+69° 34' 23"	8.4	Galaxy	11.2 x 4.3
NGC5194 M51 - Whirlpool galaxy	13h 30m 50.6s	+47° 04' 38"	8.4	Galaxy	11.2 x 6.9
NGC2403 CALDWELL 7	07h 39m 02.9s	+65° 32' 55"	8.5	Galaxy	23.4 x 11.8
NGC2841	09h 23m 37.0s	+50° 52' 38"	9.2	Galaxy	8.1 x 3.5
NGC4236-1 CALDWELL 3	12h 17m 47.9s	+69° 20' 09"	9.6	Galaxy	21.9 x 7.2
NGC5195	13h 30m 57.2s	+47° 08' 57"	9.6	Galaxy	5.9 x 4.6
NGC4125	12h 09m 13.7s	+65° 02' 47"	9.7	Galaxy	5.8 x 3.2
NGC3992 M109	11h 58m 46.5s	+53° 14' 44"	9.8	Galaxy	7.5 x 4.4
NGC2768	09h 13m 23.6s	+59° 56' 28"	9.9	Galaxy	6.4 x 3.0
NGC3077	10h 05m 09.1s	+68° 37' 23"	9.9	Galaxy	5.2 x 4.7
NGC3587 M97 - Owl nebula	11h 16m 06.9s	+54° 53' 38"	9.9	Planetary nebula	2.8
NGC5866 M102	15h 07m 07.3s	+55° 40' 33"	9.9	Galaxy	6.5 x 3.1
NGC3556 M108	11h 12m 49.4s	+55° 32' 51"	10.0	Galaxy	8.6 x 2.4
NGC2655	08h 58m 33.6s	+78° 08' 03"	10.1	Galaxy	4.9 x 4.1
NGC3953	11h 55m 00.1s	+52° 11' 49"	10.1	Galaxy	6.9 x 3.6
NGC2976	09h 49m 06.5s	+67° 48' 36"	10.2	Galaxy	5.9 x 2.7
NGC5322	13h 50m 01.0s	+60° 04' 36"	10.2	Galaxy	6.0 x 4.1
NGC6503	17h 49m 13.2s	+70° 08' 16"	10.2	Galaxy	7.0 x 2.5
NGC2681	08h 55m 11.0s	+51° 13' 29"	10.3	Galaxy	3.6 x 3.3
NGC4605	12h 41m 00.1s	+61° 28' 56"	10.3	Galaxy	5.9 x 2.4
NGC5907	15h 16m 29.7s	+56° 14' 47"	10.3	Galaxy	12.6 x 1.4
NGC2336	07h 30m 58.2s	+80° 07' 45"	10.4	Galaxy	7.1 x 3.9
NGC2985	09h 52m 23.1s	+72° 10' 13"	10.4	Galaxy	4.6 x 3.4
NGC3631	11h 22m 20.2s	+53° 02' 36"	10.4	Galaxy	5.0 x 3.7
IC2574 - Coddington nebula	10h 30m 03.0s	+68° 17' 55"	10.4	Galaxy	13.2 x 5.4
NGC2146	06h 22m 17.5s	+78° 20' 40"	10.6	Galaxy	5.4 x 2.9
NGC3147	10h 18m 48.2s	+73° 17' 05"	10.6	Galaxy	3.9 x 3.5
NGC3359	10h 48m 06.0s	+63° 06' 06"	10.6	Galaxy	7.2 x 4.4
NGC4088	12h 06m 44.3s	+50° 24' 45"	10.6	Galaxy	5.6 x 2.1
IC3568	12h 33m 43.7s	+82° 26' 15"	10.6	Planetary nebula	10.2"
NGC2787	09h 21m 20.9s	+69° 06' 19"	10.7	Galaxy	3.1 x 1.8
NGC3898	11h 50m 28.0s	+55° 57' 24"	10.7	Galaxy	4.4 x 2.6
NGC3998	11h 59m 06.9s	+55° 19' 33"	10.7	Galaxy	2.7 x 2.3
NGC4036	12h 02m 37.2s	+61° 46' 05"	10.7	Galaxy	4.3 x 1.7
NGC4589	12h 38m 17.6s	+74° 03' 56"	10.7	Galaxy	3.4 x 2.8
NGC5585	14h 20m 31.6s	+56° 37' 27"	10.7	Galaxy	5.8 x 3.6
NGC3310	10h 40m 10.6s	+53° 22' 59"	10.8	Galaxy	3.1 x 2.4
NGC3610	11h 19m 44.6s	+58° 39' 38"	10.8	Galaxy	2.7 x 2.3
NGC3718	11h 33m 50.2s	+52° 56' 24"	10.8	Galaxy	8.1 x 4.0
NGC4026	12h 00m 35.7s	+50° 50' 02"	10.8	Galaxy	5.2 x 1.3
NGC5474	14h 05m 50.4s	+53° 33' 12"	10.8	Galaxy	4.7
NGC2950	09h 44m 14.0s	+58° 44' 44"	10.9	Galaxy	2.7 x 1.8
NGC3079	10h 03m 30.4s	+55° 34' 11"	10.9	Galaxy	8.1 x 1.3
NGC3613	11h 19m 55.3s	+57° 52' 28"	10.9	Galaxy	3.9 x 1.9
NGC3690B	11h 29m 50.0s	+58° 26' 15"	10.9	Galaxy	2.0 x 1.4
NGC3945	11h 54m 25.6s	+60° 32' 50"	10.9	Galaxy	5.2 x 3.5
NGC2300	07h 39m 42.9s	+85° 39' 25"	11.0	Galaxy	2.8 x 2.0

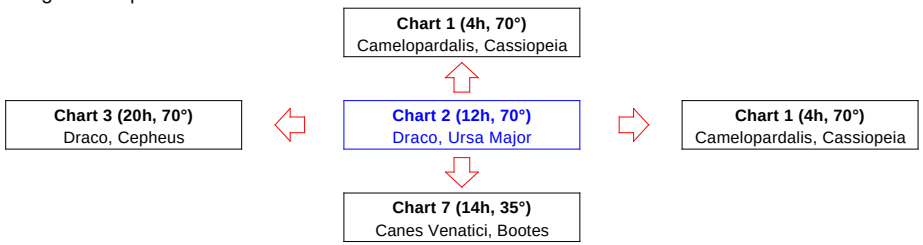
Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
BU 1077 AC	11h 06m 32.4s	+61° 30' 08"	2.02 / 7.19	370.0 / 205
STF 1744 AB (Mizar, Alcor)	13h 25m 44.9s	+54° 41' 13"	2.23 / 3.88	14.6 / 154
STF 1744 AC	13h 25m 44.9s	+54° 41' 13"	2.23 / 4.01	707.7 / 72
SMR 4 AD	13h 25m 44.9s	+54° 41' 13"	2.23 / 7.62	492.8 / 102
STT 312 AB,C	16h 24m 38.1s	+61° 24' 37"	2.80 / 8.10	565.8 / 240
STF 1821 AB (κ_2 Boo)	14h 15m 07.4s	+51° 34' 36"	4.53 / 6.62	13.8 / 235
STF 2241 AB (Dziban)	17h 41m 07.4s	+72° 07' 42"	4.60 / 5.59	29.6 / 14
STFA 26 AB (Asellus secondus)	14h 17m 48.3s	+51° 09' 19"	4.76 / 7.39	39.0 / 33
STF 1694 AB	12h 49m 43.6s	+83° 09' 46"	5.29 / 5.74	21.8 / 324
S 649 CA	13h 30m 08.3s	+59° 42' 32"	5.46 / 8.19	182.2 / 111
STF 2308 AB (41 Dra)	17h 56m 41.8s	+80° 00' 08"	5.70 / 6.00	18.8 / 232
STF 2308 AC	17h 56m 41.8s	+80° 00' 08"	5.70 / 8.34	225.3 / 129
SHJ 86 AB	08h 06m 35.8s	+62° 57' 28"	6.15 / 7.53	51.6 / 81
SHJ 136	12h 12m 59.7s	+81° 27' 14"	6.15 / 8.25	71.9 / 74
ARN 71 AD	09h 23m 53.9s	+51° 04' 06"	6.19 / 7.89	230.7 / 51
BUP 143 AC	12h 32m 14.0s	+51° 16' 55"	6.21 / 8.45	217.5 / 333
STTA 127 AB	13h 52m 08.6s	+68° 05' 21"	6.53 / 8.32	87.4 / 62
STF 1520	11h 18m 40.3s	+52° 31' 17"	6.54 / 7.81	12.4 / 344
STFA 25 AB	13h 15m 03.0s	+67° 02' 43"	6.64 / 7.08	179.1 / 296
STF 1972 AB (π_1 UMi)	15h 26m 47.0s	+80° 17' 27"	6.64 / 7.30	31.6 / 80
STF 1415 AB	10h 21m 27.9s	+70° 49' 44"	6.65 / 7.27	16.5 / 168
STTA 123 AB	13h 28m 38.0s	+64° 29' 53"	6.65 / 7.03	69.2 / 145
STT 565 AC	08h 20m 43.9s	+59° 02' 37"	6.71 / 8.45	226.1 / 308
HJL 1046 AB (17 Lyn)	07h 13m 43.9s	+60° 42' 48"	6.76 / 7.95	184.0 / 164
SHJ 191	15h 00m 57.1s	+53° 40' 46"	6.86 / 7.57	40.4 / 342
STTA 122 AB	13h 15m 28.7s	+56° 27' 56"	6.88 / 8.11	126.0 / 216

Main variable stars

Name	RA (J2023)	DEC	Magnitude	Max/Per (d)	Type
RY Dra	12h 57m 19.8s	+65° 52' 13"	6.03 / 8.0	200	P - Semi-irr
R UMa	10h 46m 14.2s	+68° 39' 15"	6.5 / 13.7	Mar 30 / 302	P - Mira
VW UMa	11h 00m 34.5s	+69° 51' 55"	6.85 / 7.71	610	P - Semi-irr
RY UMa	12h 21m 32.9s	+61° 10' 56"	6.68 / 8.3	310	P - Semi-irr
AA Cam	07h 17m 17.7s	+68° 45' 45"	9.0 / 9.6		P - Irr Superg
T UMa	12h 37m 25.8s	+59° 21' 38"	6.6 / 13.5	Jan 27, Oct 11 / 257	P - Mira
S UMa	12h 44m 56.7s	+60° 58' 03"	7.1 / 12.7	Mar 18, Oct 30 / 226	P - Mira
R Cam	14h 16m 22.9s	+83° 43' 34"	6.97 / 14.4	Jul 31 / 270	P - Mira
RU Cam	07h 24m 12.3s	+69° 37' 31"	8.10 / 9.79	22	P - δ Cep

Navigation map

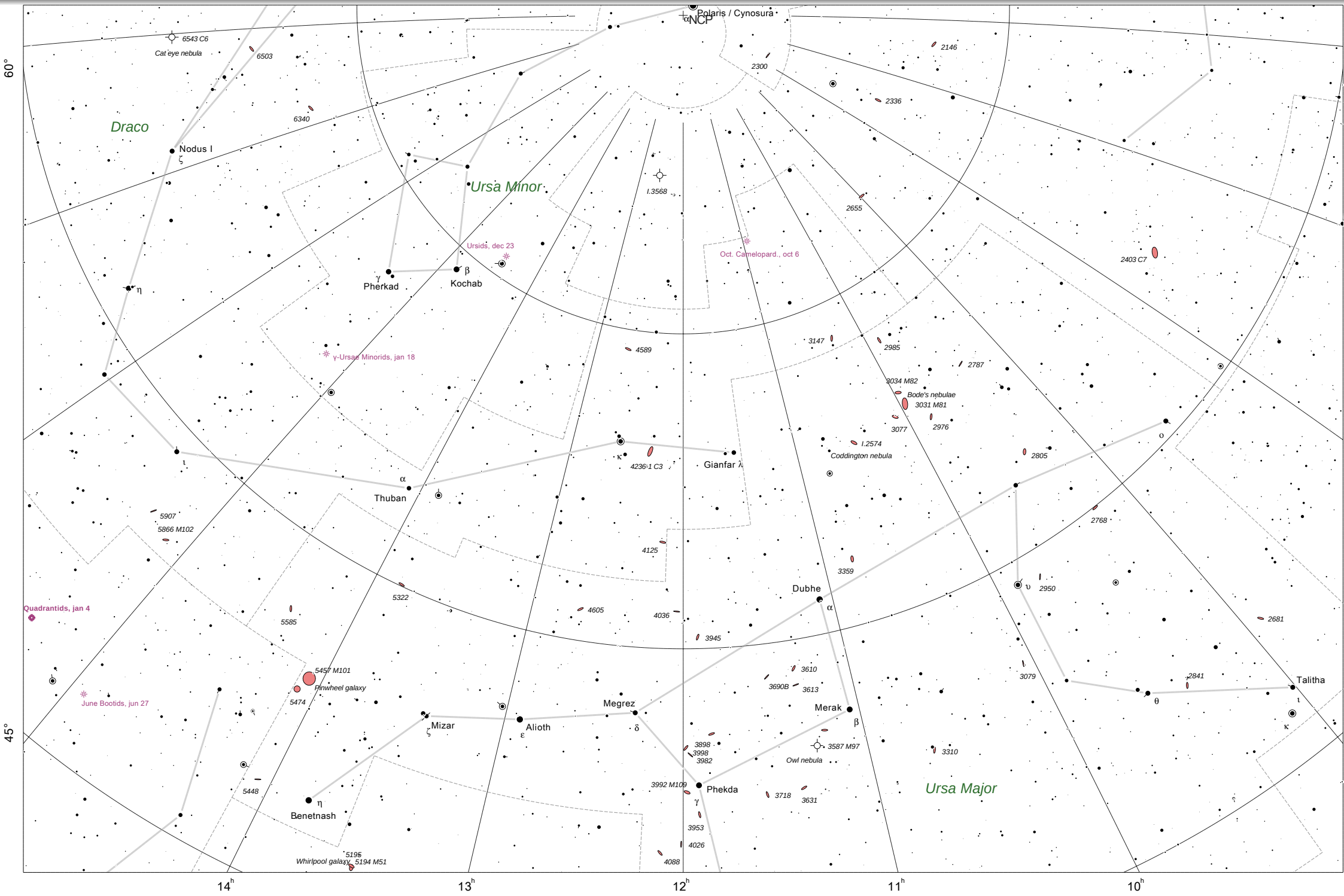


Stellar magnitudes

Types of stars

Symbols for deep sky objects (star cluster, nebula, galaxy) and constellation figure/boundary

Chart 2, 30º around 12.0h, 70.0º (Draco, Ursa Major, Ursa Minor, Camelopardalis)



Main objects visible on chart 3

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
Sh2-155 CALDWELL 9 - Cave nebula	22h 58m 12.8s	+62° 45' 57"		Nebula	50.4 x 30.0
IC5146 CALDWELL 19 - Cocoon nebula	21h 54m 17.3s	+47° 22' 33"		Nebula	10.0
NGC7635 CALDWELL 11 - Bubble nebula	23h 21m 46.3s	+61° 20' 16"		Nebula	15.0 x 8.0
NGC7023 CALDWELL 4 - Iris nebula	21h 01m 52.3s	+68° 15' 38"		Nebula	10.0 x 8.0
NGC7092 M39	21h 32m 41.9s	+48° 31' 38"	4.6	Open cluster	31.0
NGC7160	21h 54m 19.9s	+62° 42' 45"	6.1	Open cluster	5.0
NGC7243 CALDWELL 16	22h 16m 03.1s	+50° 00' 45"	6.4	Open cluster	30.0
NGC129	00h 31m 15.9s	+60° 20' 19"	6.5	Open cluster	12.0
NGC654	01h 45m 35.6s	+61° 59' 52"	6.5	Open cluster	6.0
NGC6341 M92	17h 17m 49.7s	+43° 06' 48"	6.5	Globular cluster	14.0
NGC7789	23h 58m 38.9s	+56° 50' 33"	6.7	Open cluster	25.0
NGC7654 M52	23h 25m 50.1s	+61° 43' 36"	6.9	Open cluster	16.0
NGC225	00h 44m 57.7s	+61° 53' 32"	7.0	Open cluster	15.0
NGC663 CALDWELL 10	01h 47m 53.0s	+61° 19' 58"	7.1	Open cluster	15.0
NGC7082	21h 30m 07.5s	+47° 13' 41"	7.2	Open cluster	24.0
NGC7380	22h 48m 16.4s	+58° 15' 12"	7.2	Open cluster	20.0
NGC581 M103	01h 34m 55.6s	+60° 46' 33"	7.4	Open cluster	6.0
NGC7209	22h 06m 03.2s	+46° 35' 45"	7.7	Open cluster	15.0
NGC7234	22h 13m 13.1s	+57° 23' 15"	7.7	Open cluster	6.0
NGC6939	20h 31m 57.5s	+60° 44' 25"	7.8	Open cluster	10.0
NGC659	01h 45m 59.0s	+60° 47' 05"	7.9	Open cluster	6.0
NGC7510	23h 12m 03.5s	+60° 41' 39"	7.9	Open cluster	7.0
NGC188 CALDWELL 1	00h 49m 60.0s	+85° 23' 01"	8.1	Open cluster	15.0
NGC6543 CALDWELL 6 - Cat eye nebula	17h 58m 33.0s	+66° 37' 58"	8.1	Planetary nebula	19.8"
Stock12	23h 36m 42.5s	+52° 48' 38"	8.1	Open cluster	20.0
NGC637	01h 44m 41.4s	+64° 09' 06"	8.2	Open cluster	3.0
NGC7086	21h 31m 14.7s	+51° 42' 09"	8.4	Open cluster	12.0
NGC7261	22h 20m 59.9s	+58° 13' 34"	8.4	Open cluster	6.0
NGC7790	23h 59m 34.7s	+61° 20' 11"	8.5	Open cluster	5.0
King14	00h 33m 13.4s	+63° 17' 36"	8.5	Open cluster	7.0
NGC189	00h 40m 56.1s	+61° 13' 16"	8.8	Open cluster	5.0
NGC6826 CALDWELL 15 - Blinking planetary	19h 45m 25.4s	+50° 34' 56"	8.8	Planetary nebula	36.0"
NGC6946	20h 35m 21.0s	+60° 14' 01"	8.8	Galaxy	11.5 x 9.8
IC1369	21h 12m 57.1s	+47° 51' 43"	8.8	Open cluster	5.0
Tr1	01h 37m 15.7s	+61° 24' 01"	8.9	Open cluster	4.5
IC1434	22h 11m 22.1s	+52° 56' 50"	9.0	Open cluster	7.0
NGC433	01h 16m 37.4s	+60° 14' 49"	9.0	Open cluster	4.0
NGC7296	22h 28m 57.2s	+52° 24' 23"	9.0	Open cluster	4.0
NGC146	00h 34m 22.7s	+63° 25' 42"	9.1	Open cluster	5.0
NGC7031	21h 07m 36.9s	+50° 56' 12"	9.1	Open cluster	15.0
IC1442	22h 16m 58.2s	+54° 06' 25"	9.1	Open cluster	5.0
NGC7245	22h 16m 03.8s	+54° 27' 30"	9.2	Open cluster	5.0
King19	23h 09m 16.7s	+60° 38' 29"	9.2	Open cluster	7.0
NGC381	01h 09m 47.6s	+61° 42' 20"	9.3	Open cluster	7.0
NGC7142	21h 45m 42.2s	+65° 52' 52"	9.3	Open cluster	12.0
King12	23h 54m 09.1s	+62° 05' 41"	9.3	Open cluster	2.0
NGC133	00h 32m 37.3s	+63° 28' 42"	9.4	Open cluster	3.0
NGC6229	16h 47m 37.8s	+47° 29' 18"	9.4	Globular cluster	4.5
NGC7788	23h 57m 56.1s	+61° 31' 41"	9.4	Open cluster	4.0
NGC559 CALDWELL 8	01h 31m 05.2s	+63° 25' 12"	9.5	Open cluster	7.0
NGC7226	22h 11m 17.3s	+55° 30' 45"	9.6	Open cluster	2.0
NGC7067	21h 25m 01.6s	+48° 06' 40"	9.7	Open cluster	3.0
NGC7128	21h 44m 45.0s	+53° 49' 18"	9.7	Open cluster	4.0
NGC103	00h 26m 34.4s	+61° 26' 57"	9.8	Open cluster	5.0
Stock19	00h 05m 35.7s	+56° 09' 41"	9.8	Open cluster	3.0 x 1.0
Stock24	00h 41m 02.9s	+62° 04' 34"	9.8	Open cluster	6.0
King48	22h 53m 56.5s	+58° 24' 22"	9.9	Open cluster	4.0
NGC7762	23h 51m 07.6s	+68° 09' 59"	10.0	Open cluster	15.0
NGC110	00h 28m 47.3s	+71° 31' 04"	10.0	Open cluster	19.0
NGC366	01h 07m 53.5s	+62° 21' 05"	10.0	Open cluster	4.0
NGC743	02h 00m 14.5s	+60° 16' 40"	10.0	Open cluster	7.0
NGC7281	22h 25m 46.8s	+57° 57' 27"	10.0	Open cluster	12.0
King16	00h 45m 05.0s	+64° 18' 32"	10.1	Open cluster	3.0
King21	23h 51m 02.2s	+62° 50' 41"	10.1	Open cluster	2.5
NGC6503	17h 49m 13.2s	+70° 08' 16"	10.2	Galaxy	7.0 x 2.5
IC10	00h 21m 40.0s	+59° 25' 12"	10.4	Galaxy	6.4 x 5.3
NGC6952	20h 37m 31.0s	+66° 11' 13"	10.7	Galaxy	3.9 x 3.2
NGC7008	21h 01m 13.1s	+54° 38' 05"	10.7	Planetary nebula	1.4
NGC609	01h 38m 01.1s	+64° 39' 12"	11.0	Open cluster	3.0
NGC6340	17h 10m 00.6s	+72° 16' 38"	11.0	Galaxy	3.0 x 2.8

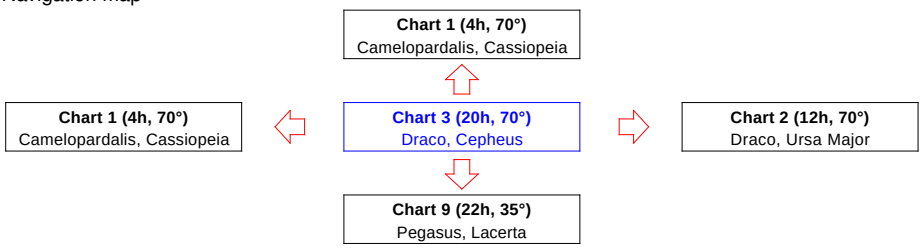
Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
STT 312 AB,C	16h 24m 38.1s	+61° 24' 37"	2.80 / 8.10	565.8 / 240
STFA 58 AC	22h 30m 53.0s	+58° 39' 07"	4.21 / 6.11	41.0 / 191
STF 2241 AB (Dziban)	17h 41m 07.4s	+72° 07' 42"	4.60 / 5.59	29.6 / 14
STF 2420 AB (*o* Dra)	18h 51m 52.1s	+59° 26' 44"	4.77 / 8.26	37.6 / 316
STFA 35 (ν_2 Dra)	17h 33m 09.8s	+55° 08' 33"	4.87 / 4.90	62.1 / 311
SHJ 355 AC	23h 32m 10.8s	+58° 48' 11"	4.87 / 7.23	75.0 / 269
H 6 37 AC	18h 43m 31.4s	+55° 35' 14"	5.01 / 8.24	331.2 / 340
STF 2323 AC	18h 24m 35.5s	+58° 49' 39"	5.06 / 7.95	88.9 / 20
STFA 30 AC	16h 37m 19.5s	+52° 50' 01"	5.38 / 5.50	90.2 / 193
STH 7 AC	20h 25m 05.6s	+81° 34' 33"	5.48 / 6.66	196.6 / 282
STF 2840 AB	21h 53m 34.6s	+56° 00' 51"	5.64 / 6.42	18.1 / 197
STF 2308 AB (41 Dra)	17h 56m 41.8s	+80° 00' 08"	5.70 / 6.00	18.8 / 232
STF 2308 AC	17h 56m 41.8s	+80° 00' 08"	5.70 / 8.34	225.3 / 129
S 823 AC	23h 11m 43.2s	+59° 34' 59"	5.72 / 8.16	167.2 / 163
STF 2816 AC	21h 40m 23.8s	+57° 41' 54"	5.73 / 7.48	11.8 / 121
STF 2816 AD	21h 40m 23.8s	+57° 41' 54"	5.73 / 7.53	20.6 / 339
S 838 AD	00h 06m 38.2s	+62° 32' 38"	5.92 / 8.24	244.0 / 197
STF 3053 AB	00h 04m 59.8s	+66° 21' 18"	5.96 / 7.17	15.2 / 70
STFA 46 AB (16 Cyg)	19h 43m 03.0s	+50° 38' 10"	6.00 / 6.23	39.5 / 132
BEI 2 AC	22h 20m 47.5s	+63° 32' 41"	6.14 / 8.46	10.9 / 78
STF 2893	22h 13m 41.8s	+73° 32' 10"	6.19 / 7.91	28.9 / 348
STTA 200 AB (65 Dra)	20h 02m 49.6s	+64° 45' 54"	6.36 / 8.06	98.9 / 332
STF 2687	20h 27m 29.4s	+56° 47' 30"	6.37 / 8.31	25.1 / 118
ARY 43	21h 58m 21.4s	+66° 22' 36"	6.38 / 6.75	100.4 / 128
STFA 30 BC	16h 37m 19.5s	+52° 49' 60"	6.42 / 5.50	90.1 / 194

Main variable stars

Name	RA (J2023)	DEC	Magnitude	Max/Per (d)	Type
Cih (γ Cas)	00h 58m 07.0s	+60° 50' 27"	1.6 / 3.0		Er - γ Cas
μ Cep	21h 44m 12.8s	+58° 53' 10"	3.43 / 5.1	730	P - Semi-irr
δ Cep	22h 30m 01.8s	+58° 32' 00"	3.48 / 4.37	5.37	P - δ Cep
CH Cyg	19h 25m 09.3s	+50° 17' 15"	5.60 / 8.49		Er - U Gem
U Cep	01h 04m 28.7s	+81° 59' 55"	6.75 / 9.24	2.49	Ecl - Algol
RU Cyg	21h 41m 25.4s	+54° 25' 47"	9.2 / 11.6	Jun 24 / 233	P - Semi-irr
T Cep	21h 09m 49.4s	+68° 35' 06"	5.2 / 11.3	Sep 30 / 388	P - Mira
S Cep	21h 34m 52.9s	+78° 43' 40"	7.4 / 12.9	Oct 18 / 487	P - Mira
EK Cep	21h 41m 45.0s	+69° 47' 54"	7.99 / 9.32	4.43	Ecl - Algol
R Cyg	19h 37m 26.4s	+50° 15' 09"	6.1 / 14.4	Mar 1 / 426	P - Mira
R Cam	14h 16m 22.9s	+83° 43' 34"	6.97 / 14.4	Jul 31 / 270	P - Mira

Navigation map

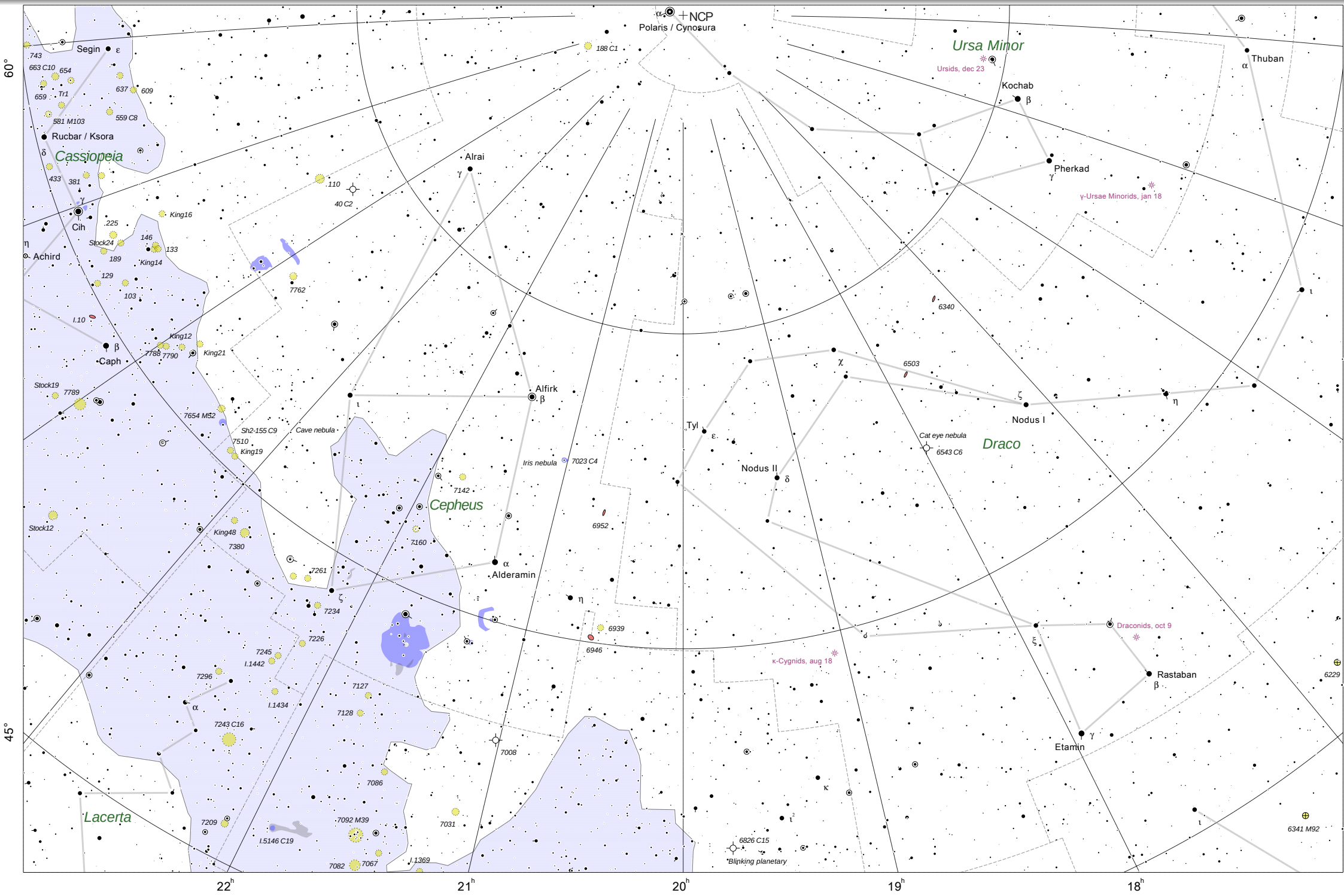


Stellar magnitudes: -1 0 1 2 3 4 5 6 7 8

Types of stars: Double Variable

Symbols for deep sky objects (star cluster, nebula, galaxy) and constellation figure/boundary: Open cluster, Globular, Nebulose, Milky Way, Plan.neb., Galaxy, Constellation, Const. limit, Meteors

Chart 3, 30º around 20.0h, 70.0º (Draco, Cepheus, Cygnus, Cassiopeia)



Main objects visible on chart 4

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
Mel20 - Alpha Persei cluster	03h 23m 38.1s	+49° 04' 52"	1.2	Open cluster	3.08°
Mel22 M45 - Pleiades Cluster	03h 48m 46.3s	+24° 11' 11"	1.2	Open cluster	1.83°
NGC224 M31 - Andromeda nebula	00h 44m 00.1s	+41° 23' 41"	3.4	Galaxy	3.15° x 1.03°
NGC1039 M34	02h 43m 34.3s	+42° 51' 31"	5.2	Open cluster	25.0
NGC7686	23h 31m 13.5s	+49° 15' 40"	5.6	Open cluster	15.0
NGC598 M33 - Triangulum galaxy	01h 35m 09.9s	+30° 46' 31"	5.7	Galaxy	68.7 x 41.6
NGC752 CALDWELL 28	01h 58m 57.5s	+37° 56' 41"	5.7	Open cluster	75.0
NGC1545	04h 22m 40.6s	+50° 18' 31"	6.2	Open cluster	12.0
NGC1342	03h 33m 07.5s	+37° 27' 13"	6.7	Open cluster	17.0
NGC1582	04h 33m 17.0s	+43° 47' 28"	7.0	Open cluster	24.0
IC348	03h 46m 00.9s	+32° 14' 03"	7.3	Open cluster	10.0
NGC1664	04h 52m 44.2s	+43° 42' 49"	7.6	Open cluster	18.0
NGC205 M110	00h 41m 37.7s	+41° 48' 41"	8.1	Galaxy	19.5 x 11.5
NGC221 M32	00h 43m 57.5s	+40° 59' 30"	8.1	Galaxy	8.5 x 6.5
NGC7662 CALDWELL 22 - Blue snowball	23h 27m 00.5s	+42° 39' 44"	8.3	Planetary nebula	37.2"
NGC1245	03h 16m 17.2s	+47° 19' 22"	8.4	Open cluster	10.0
NGC1513	04h 11m 39.8s	+49° 34' 25"	8.4	Open cluster	12.0
NGC956	02h 33m 44.5s	+44° 44' 50"	9.0	Open cluster	9.0
NGC185 CALDWELL 18	00h 40m 14.3s	+48° 27' 48"	9.2	Galaxy	8.0 x 7.0
NGC628 M74	01h 37m 56.0s	+15° 54' 00"	9.4	Galaxy	10.5 x 9.5
NGC1023	02h 41m 51.0s	+39° 09' 40"	9.4	Galaxy	7.4 x 2.5
NGC147 CALDWELL 17	00h 34m 27.5s	+48° 38' 02"	9.5	Galaxy	13.2 x 7.8
NGC891 CALDWELL 23	02h 24m 00.1s	+42° 27' 04"	9.9	Galaxy	11.7 x 1.6
NGC650 M76 - Little Dumbbell	01h 43m 45.7s	+51° 41' 12"	10.1	Planetary nebula	3.1
NGC925	02h 28m 39.8s	+33° 40' 52"	10.1	Galaxy	10.5 x 5.9
NGC404 - Mirach's ghost	01h 10m 44.3s	+35° 50' 26"	10.3	Galaxy	3.5
NGC772	02h 00m 35.5s	+19° 07' 06"	10.3	Galaxy	7.2 x 4.3
NGC7814 CALDWELL 43	00h 04m 25.7s	+16° 16' 24"	10.6	Galaxy	5.5 x 2.3
NGC1605	04h 36m 31.9s	+45° 19' 03"	10.7	Open cluster	5.0
NGC278	00h 53m 22.9s	+47° 40' 32"	10.8	Galaxy	2.1 x 2.0
NGC672	01h 49m 12.0s	+27° 32' 48"	10.9	Galaxy	6.0 x 2.4
NGC1514	04h 10m 44.0s	+30° 50' 08"	10.9	Planetary nebula	2.2
NGC1161	03h 02m 46.7s	+44° 59' 14"	11.0	Galaxy	2.8 x 2.0
NGC1275 CALDWELL 24 - Perseus A	03h 21m 19.7s	+41° 35' 36"	11.9	Galaxy	2.3 x 1.6

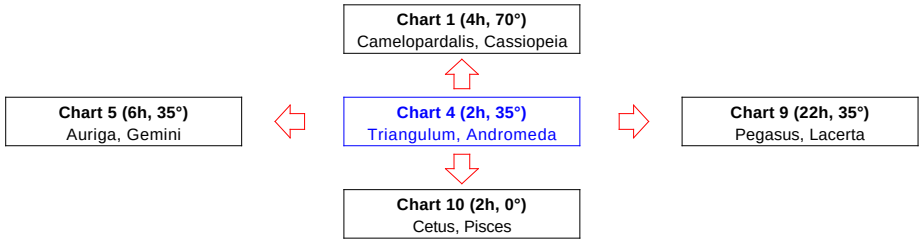
Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
STFA 8 AB (Alcyone)	03h 50m 13.6s	+24° 14' 38"	2.83 / 6.27	117.6 / 291
STFA 8 AC	03h 50m 13.6s	+24° 14' 38"	2.83 / 8.22	182.0 / 313
H 5 17 AB (π And)	00h 39m 21.3s	+33° 58' 19"	4.36 / 7.08	36.2 / 175
H 5 12 AB (λ Ari)	02h 00m 30.9s	+23° 49' 06"	4.80 / 6.65	37.3 / 48
H 6 69 AB (14 Ari)	02h 12m 02.7s	+26° 09' 20"	4.99 / 8.01	93.1 / 35
H 6 69 AC	02h 12m 02.7s	+26° 09' 20"	5.02 / 7.97	106.0 / 279
STF 331	03h 04m 10.6s	+52° 31' 51"	5.21 / 6.17	12.0 / 86
STF 88 AB (ψ_1 Psc)	01h 08m 09.5s	+21° 43' 07"	5.27 / 5.45	29.8 / 159
AG 304 (15 Tri)	02h 38m 35.5s	+34° 53' 08"	5.57 / 6.75	142.4 / 16
HJL 1026 AB (21 Tau)	03h 48m 39.0s	+24° 41' 41"	5.75 / 6.42	149.6 / 130
STFA 4 AB (56 And)	01h 58m 53.5s	+37° 28' 29"	5.79 / 6.07	202.5 / 298
BUP 30 AC	02h 25m 43.5s	+41° 36' 12"	5.83 / 7.42	305.8 / 9
STT 559 AB (39 Tau)	04h 08m 03.4s	+22° 07' 49"	5.97 / 8.09	176.6 / 357
STF 222 (59 And)	02h 13m 41.8s	+39° 15' 15"	6.05 / 6.71	16.6 / 36
STFA 8 BC	03h 50m 05.6s	+24° 15' 18"	6.27 / 8.22	86.2 / 345
STFA 5 AB (30 Ari)	02h 39m 40.5s	+24° 50' 40"	6.50 / 7.02	37.9 / 275
STF 401 AB	03h 34m 08.2s	+27° 43' 30"	6.58 / 6.93	11.5 / 270
STTA 40 AB	03h 52m 07.1s	+24° 31' 05"	6.58 / 7.53	86.7 / 308
STF 40 AB	00h 37m 38.8s	+37° 05' 06"	6.72 / 8.48	11.8 / 313
STTA 252	23h 57m 16.9s	+29° 43' 54"	6.77 / 8.37	111.1 / 145
STTA 38 AB	03h 47m 25.7s	+28° 02' 21"	6.78 / 6.91	135.4 / 53

Main variable stars

Name	RA (J2023)	DEC	Magnitude	Max/Per (d)	Type
Algol (β Per)	03h 09m 40.5s	+41° 02' 33"	2.12 / 3.39	2.87	Ecl - Algol
RW Tau	04h 05m 19.5s	+28° 11' 15"	7.98 / 11.59	2.77	Ecl - Algol
Z Peg	00h 01m 17.4s	+26° 00' 52"	7.3 / 13.6	Jun 29 / 335	P - Mira

Navigation map

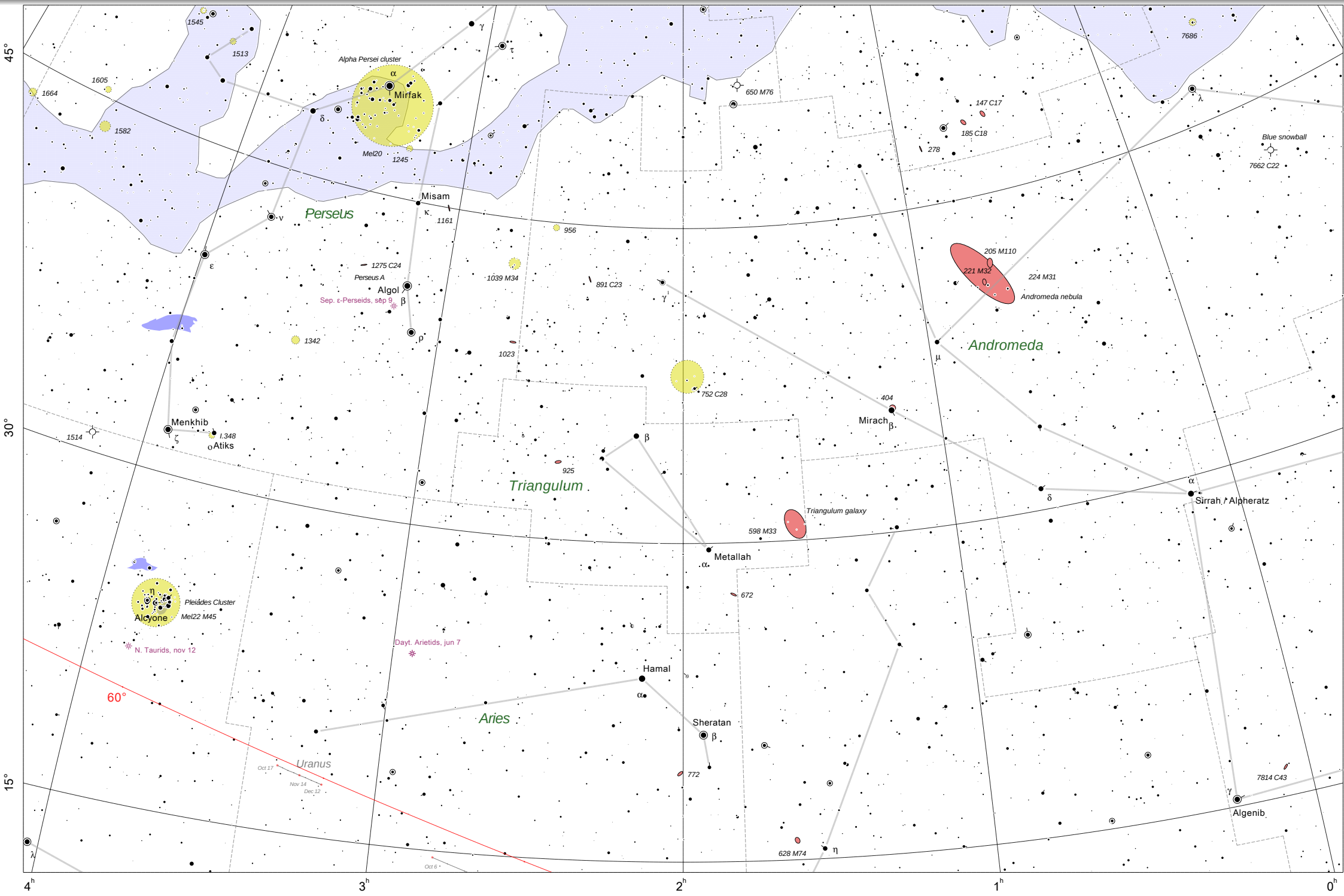


Stellar magnitudes

Types of stars

Symbols for deep sky objects (star cluster, nebula, galaxy) and constellation figure/boundary

Chart 4, 30º around 2.0h, 35.0º (Triangulum, Andromeda, Perseus, Pisces)



Main objects visible on chart 5

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
IC405 CALDWELL 31 - Flaming Star nebula	05h 18m 00.8s	+34° 22' 47"		Nebula	30.0 x 20.0
Mel25 CALDWELL 41 - Hyades Cluster	04h 28m 18.8s	+16° 03' 01"	1.0	Open cluster	5.50°
Mel20 - Alpha Persei cluster	03h 23m 38.1s	+49° 04' 52"	1.2	Open cluster	3.08°
Mel22 M45 - Pleiades Cluster	03h 48m 46.3s	+24° 11' 11"	1.2	Open cluster	1.83°
NGC2168 M35	06h 10m 24.6s	+24° 20' 40"	5.1	Open cluster	25.0
NGC2281	06h 49m 54.7s	+41° 03' 06"	5.4	Open cluster	25.0
NGC2099 M37	05h 53m 48.6s	+32° 33' 25"	5.6	Open cluster	15.0
NGC1960 M36	05h 37m 49.2s	+34° 09' 13"	6.0	Open cluster	10.0
NGC1545	04h 22m 40.6s	+50° 18' 31"	6.2	Open cluster	12.0
NGC1528	04h 17m 04.1s	+51° 16' 04"	6.4	Open cluster	18.0
NGC1647	04h 47m 03.0s	+19° 09' 35"	6.4	Open cluster	40.0
NGC1912 M38	05h 30m 15.7s	+35° 52' 19"	6.4	Open cluster	15.0
NGC1342	03h 33m 07.5s	+37° 27' 13"	6.7	Open cluster	17.0
NGC2129	06h 02m 30.5s	+23° 19' 00"	6.7	Open cluster	6.0
NGC2175	06h 11m 00.8s	+20° 28' 57"	6.8	Open cluster	40.0 x 30.0
NGC1582	04h 33m 17.0s	+43° 47' 28"	7.0	Open cluster	24.0
NGC1807	05h 12m 05.6s	+16° 32' 25"	7.0	Open cluster	12.0
NGC1857	05h 21m 40.6s	+39° 21' 54"	7.0	Open cluster	10.0
IC348	03h 46m 00.9s	+32° 14' 03"	7.3	Open cluster	10.0
NGC1893	05h 24m 16.4s	+33° 26' 05"	7.5	Open cluster	10.0
NGC1664	04h 52m 44.2s	+43° 42' 49"	7.6	Open cluster	18.0
NGC1778	05h 09m 38.3s	+37° 03' 06"	7.7	Open cluster	8.0
NGC1817	05h 13m 46.8s	+16° 42' 34"	7.7	Open cluster	20.0
NGC2395	07h 28m 30.4s	+13° 33' 38"	8.0	Open cluster	15.0
NGC1907	05h 29m 36.8s	+35° 20' 34"	8.2	Open cluster	5.0
NGC2420	07h 39m 45.5s	+21° 31' 14"	8.3	Open cluster	6.0
NGC1245	03h 16m 17.2s	+47° 19' 22"	8.4	Open cluster	10.0
NGC1513	04h 11m 39.8s	+49° 34' 25"	8.4	Open cluster	12.0
NGC1952 M1 - Crab nebula	05h 35m 55.0s	+22° 01' 42"	8.4	Nebula	6.0 x 4.0
IC2157	06h 06m 14.2s	+24° 03' 10"	8.4	Open cluster	5.0
NGC2331	07h 08m 25.7s	+27° 13' 28"	8.5	Open cluster	19.0
NGC2158	06h 08m 50.1s	+24° 05' 30"	8.6	Open cluster	5.0
NGC2392 CALDWELL 39 - Eskimo nebula	07h 30m 32.4s	+20° 51' 49"	9.1	Planetary nebula	0.9
NGC2266	06h 44m 45.3s	+26° 56' 42"	9.5	Open cluster	5.0
NGC2355	07h 18m 17.0s	+13° 42' 27"	9.7	Open cluster	8.0
NGC1798	05h 13m 23.1s	+47° 43' 19"	10.0	Open cluster	5.0
NGC2304	06h 56m 32.2s	+17° 57' 28"	10.0	Open cluster	3.0
NGC2240	06h 34m 42.7s	+35° 13' 54"	10.0	Open cluster	
NGC2126	06h 04m 20.1s	+49° 51' 50"	10.2	Open cluster	6.0
NGC2419 CALDWELL 25 - Intergalactic wande	07h 39m 41.7s	+38° 49' 44"	10.3	Globular cluster	4.6
IC2149	05h 58m 06.6s	+46° 06' 25"	10.6	Planetary nebula	34.2"
NGC1605	04h 36m 31.9s	+45° 19' 03"	10.7	Open cluster	5.0
NGC1514	04h 10m 44.0s	+30° 50' 08"	10.9	Planetary nebula	2.2
NGC2192	06h 16m 53.7s	+39° 50' 47"	10.9	Open cluster	5.0
NGC1161	03h 02m 46.7s	+44° 59' 14"	11.0	Galaxy	2.8 x 2.0
NGC1708	05h 05m 17.1s	+52° 51' 51"	11.0	Open cluster	20.0
NGC1750	05h 05m 17.8s	+23° 41' 20"	11.0	Open cluster	25.0 x 12.0
NGC1758	05h 05m 59.9s	+23° 49' 43"	11.0	Open cluster	40.0
NGC1802	05h 11m 38.2s	+24° 09' 08"	11.0	Open cluster	20.0
NGC1275 CALDWELL 24 - Perseus A	03h 21m 19.7s	+41° 35' 36"	11.9	Galaxy	2.3 x 1.6

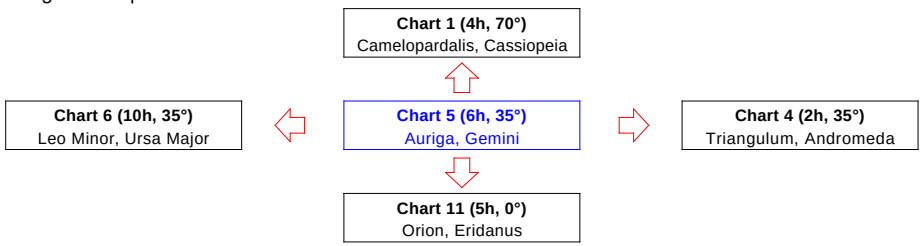
Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
SHJ 51 AG	05h 20m 05.1s	+46° 02' 39"	0.08 / 8.10	522.4 / 349
STFA 8 AB (Alcyone)	03h 50m 13.6s	+24° 14' 38"	2.83 / 6.27	117.6 / 291
STFA 8 AC	03h 50m 13.6s	+24° 14' 38"	2.83 / 8.22	182.0 / 313
STFA 10 AB (θ_2 Tau)	04h 31m 17.6s	+15° 58' 08"	3.41 / 3.94	347.9 / 339
SHJ 77 AC	07h 06m 50.5s	+20° 29' 53"	4.05 / 7.66	100.2 / 347
STTA 77 AB (ν Gem)	06h 31m 41.9s	+20° 10' 42"	4.10 / 8.01	112.8 / 330
ALC 3 AE	07h 32m 03.5s	+31° 41' 09"	4.16 / 7.82	755.4 / 355
STF 541 AB (κ Tau)	04h 28m 06.7s	+22° 23' 43"	4.22 / 5.29	339.4 / 174
S 455 AB (τ Tau)	04h 45m 01.1s	+23° 02' 27"	4.24 / 7.02	62.5 / 214
STFA 11 (σ_2 Tau)	04h 41m 54.0s	+16° 00' 18"	4.69 / 5.09	444.0 / 194
LDS 2246 AB	04h 33m 12.0s	+16° 17' 24"	4.78 / 6.54	250.3 / 131
STF 653 AC	05h 18m 24.2s	+32° 44' 07"	5.03 / 7.33	14.3 / 225
WNO 52 AC	05h 27m 05.5s	+17° 25' 18"	5.06 / 7.88	707.2 / 252
SHJ 40 AB (ϕ Tau)	04h 23m 11.4s	+27° 27' 26"	5.08 / 7.51	48.7 / 259
BLL 15 AD	05h 30m 42.3s	+34° 30' 38"	5.22 / 8.07	210.1 / 15
STF 753 AB,C	05h 41m 35.5s	+30° 30' 53"	5.46 / 8.41	12.4 / 269
ARN 36 AC	04h 33m 16.5s	+15° 47' 15"	5.48 / 5.70	484.5 / 246
HJL 1026 AB (21 Tau)	03h 48m 39.0s	+24° 41' 41"	5.75 / 6.42	149.6 / 130
STT 559 AB (39 Tau)	04h 08m 03.4s	+22° 07' 49"	5.97 / 8.09	176.6 / 357
STTA 67 AB,C	05h 51m 06.9s	+20° 52' 51"	6.01 / 8.29	75.4 / 162
SHJ 49 AB	05h 01m 35.9s	+14° 36' 33"	6.06 / 7.43	39.3 / 306
SHJ 44 AB (57 Per)	04h 36m 40.1s	+43° 09' 24"	6.12 / 6.83	121.4 / 197
ARN 42 AE	04h 36m 40.1s	+43° 09' 24"	6.12 / 7.42	442.1 / 79
STFA 8 BC	03h 50m 05.6s	+24° 15' 18"	6.27 / 8.22	86.2 / 345
STF 924 AB (20 Gem)	06h 34m 59.9s	+17° 44' 48"	6.31 / 6.88	19.9 / 212

Main variable stars

Name	RA (J2023)	DEC	Magnitude	Max/Per (d)	Type
ϵ Aur	05h 03m 37.5s	+43° 51' 18"	2.92 / 3.83	9892	Ecl - Alg
Tejat Prior (η Gem)	06h 16m 16.0s	+22° 29' 53"	3.15 / 3.9	232.9	P - Sem
Mekbuda (ζ Gem)	07h 05m 28.3s	+20° 32' 04"	3.62 / 4.18	10.15	P - δ Ce
UU Aur	06h 38m 07.6s	+38° 25' 29"	7.83 / 10.0	234	P - Sem
RT Aur	06h 30m 02.8s	+30° 28' 36"	5.00 / 5.82	3.73	P - δ Ce
U Ori	05h 57m 11.2s	+20° 10' 38"	4.8 / 13.0	May 6 / 368	P - Mira
TV Gem	06h 13m 14.5s	+21° 51' 40"	8.54 / 9.8		P - Sem
Y Lyn	07h 29m 51.7s	+45° 56' 31"	7.8 / 10.3	110	P - Sem
R Gem	07h 08m 44.3s	+22° 39' 58"	6.0 / 14.0	Mar 20 / 370	P - Mira
RW Tau	04h 05m 19.5s	+28° 11' 15"	7.98 / 11.59	2.77	Ecl - Alg
T Gem	07h 50m 40.8s	+23° 40' 31"	8.0 / 15.0	Jan 22, Nov 6 / 288	P - Mira

Navigation map

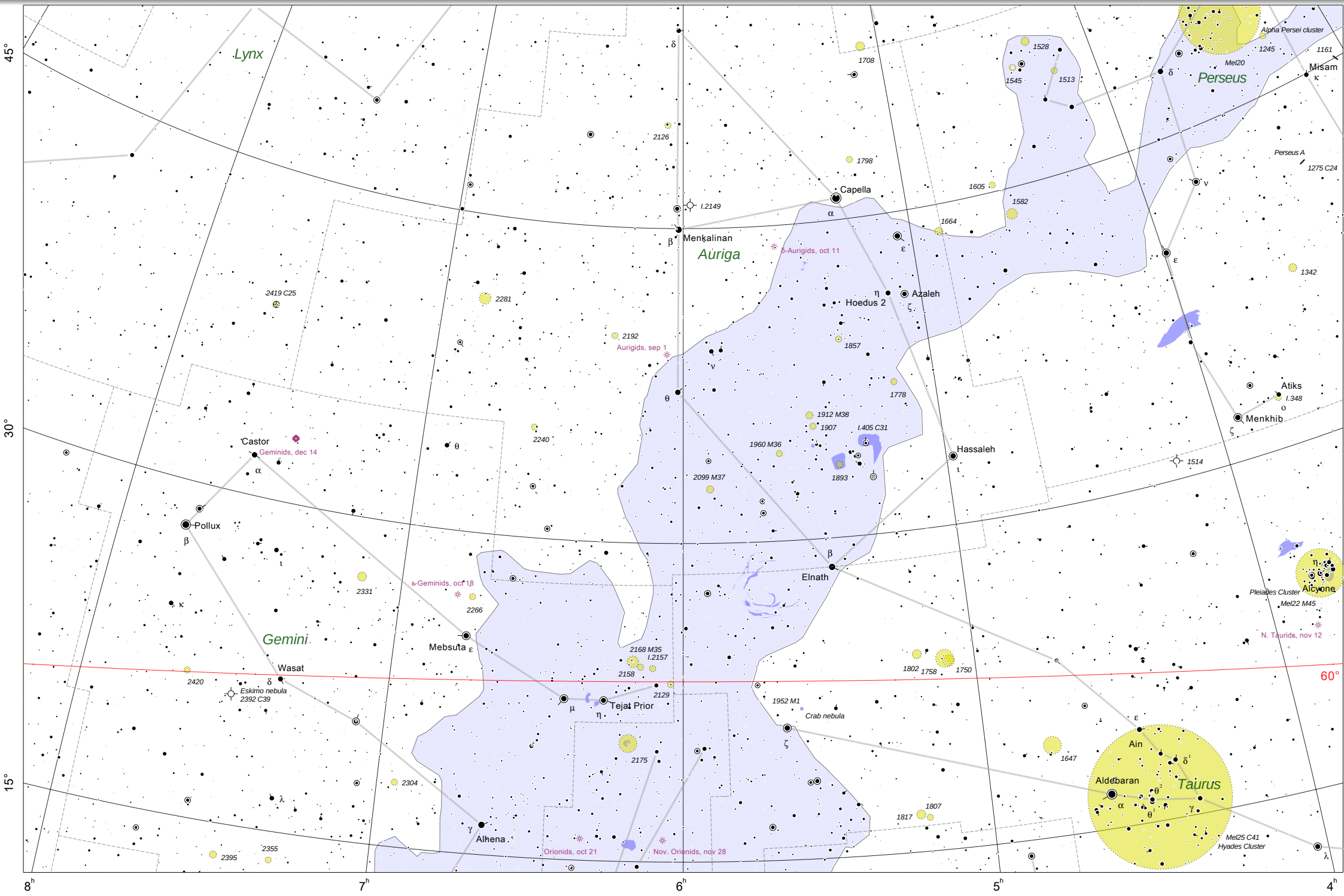


Stellar magnitudes: -1 0 1 2 3 4 5 6 7 8

Types of stars: Double Variable

Symbols for deep sky objects (star cluster, nebula, galaxy) and constellation figure/boundary: Open cluster Globular Nebulose Milky Way Plan.neb. Galaxy Constellation Const. limit Meteors

Chart 5, 30º around 6.0h, 35.0º (Auriga, Gemini, Taurus, Orion)



Main objects visible on chart 6

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
Mel111 - Berenice Hair	12h 23m 39.2s	+25° 43' 21"	2.7	Open cluster	4.58°
NGC2632 M44 - Praesepe	08h 41m 43.1s	+19° 35' 14"	3.1	Open cluster	70.0
NGC4258 M106	12h 20m 05.7s	+47° 10' 46"	8.4	Galaxy	18.6 x 7.2
NGC2903	09h 33m 27.7s	+21° 23' 48"	9.0	Galaxy	12.6 x 6.0
NGC2841	09h 23m 37.0s	+50° 52' 38"	9.2	Galaxy	8.1 x 3.5
NGC3628 - Hamburger galaxy	11h 21m 28.7s	+13° 27' 50"	9.5	Galaxy	13.1 x 3.1
NGC4449 CALDWELL 21	12h 29m 18.3s	+43° 58' 05"	9.6	Galaxy	6.2 x 4.4
NGC2683	08h 54m 06.7s	+33° 19' 56"	9.8	Galaxy	9.3 x 2.1
NGC3184	10h 19m 39.3s	+41° 18' 27"	9.8	Galaxy	7.4 x 6.9
NGC4214	12h 16m 47.9s	+36° 11' 59"	9.8	Galaxy	8.0 x 6.6
NGC4490	12h 31m 43.1s	+41° 30' 57"	9.8	Galaxy	6.4 x 3.2
NGC3344	10h 44m 46.3s	+24° 48' 06"	9.9	Galaxy	7.1 x 6.5
NGC3607	11h 18m 07.1s	+17° 55' 35"	9.9	Galaxy	4.6 x 4.0
NGC3953	11h 55m 00.1s	+52° 11' 49"	10.1	Galaxy	6.9 x 3.6
NGC3675	11h 27m 23.0s	+43° 27' 35"	10.2	Galaxy	5.9 x 3.1
NGC4051	12h 04m 19.8s	+44° 24' 14"	10.2	Galaxy	5.2 x 3.9
NGC4278	12h 21m 15.9s	+29° 09' 10"	10.2	Galaxy	3.8
NGC4395	12h 26m 57.2s	+33° 25' 10"	10.2	Galaxy	13.2 x 11.0
NGC2419 CALDWELL 25 - Intergalactic wande	07h 39m 41.7s	+38° 49' 44"	10.3	Globular cluster	4.6
NGC2681	08h 55m 11.0s	+51° 13' 29"	10.3	Galaxy	3.6 x 3.3
NGC3198	10h 21m 18.8s	+45° 26' 02"	10.3	Galaxy	8.5 x 3.3
NGC3227	10h 24m 45.6s	+19° 44' 54"	10.3	Galaxy	4.1 x 3.9
NGC3489	11h 01m 31.1s	+13° 46' 37"	10.3	Galaxy	3.6 x 2.2
NGC3941	11h 54m 06.7s	+36° 51' 32"	10.3	Galaxy	3.5 x 2.5
NGC3631	11h 22m 20.2s	+53° 02' 36"	10.4	Galaxy	5.0 x 3.7
NGC3726	11h 34m 35.3s	+46° 54' 02"	10.4	Galaxy	6.0 x 4.1
NGC3938	11h 54m 00.8s	+43° 59' 36"	10.4	Galaxy	5.4 x 4.9
NGC4244 CALDWELL 26	12h 18m 38.8s	+37° 40' 48"	10.4	Galaxy	16.6 x 1.9
NGC4274	12h 20m 60.0s	+29° 29' 10"	10.4	Galaxy	6.8 x 2.4
NGC3486	11h 01m 39.0s	+28° 51' 06"	10.5	Galaxy	7.1 x 5.2
NGC3893	11h 49m 50.6s	+48° 35' 01"	10.5	Galaxy	4.5 x 2.8
NGC4088	12h 06m 44.3s	+50° 24' 45"	10.6	Galaxy	5.6 x 2.1
NGC4314	12h 23m 40.8s	+29° 46' 06"	10.6	Galaxy	4.2 x 3.7
NGC4111	12h 08m 12.7s	+42° 56' 19"	10.7	Galaxy	4.6 x 1.0
NGC4251	12h 19m 17.8s	+28° 02' 52"	10.7	Galaxy	3.6 x 1.5
NGC3245	10h 28m 35.4s	+28° 23' 24"	10.8	Galaxy	3.2 x 1.8
NGC3310	10h 40m 10.6s	+53° 22' 59"	10.8	Galaxy	3.1 x 2.4
NGC3608	11h 18m 11.6s	+18° 01' 20"	10.8	Galaxy	3.2 x 2.6
NGC3665	11h 25m 58.0s	+38° 38' 11"	10.8	Galaxy	4.3 x 3.3
NGC3718	11h 33m 50.2s	+52° 56' 24"	10.8	Galaxy	8.1 x 4.0
NGC4026	12h 00m 35.7s	+50° 50' 02"	10.8	Galaxy	5.2 x 1.3
NGC4151	12h 11m 41.8s	+39° 16' 44"	10.8	Galaxy	6.3 x 4.5
NGC4242	12h 18m 38.3s	+45° 29' 29"	10.8	Galaxy	5.2 x 4.0
NGC4618	12h 42m 38.8s	+41° 01' 31"	10.8	Galaxy	4.2 x 3.4
NGC2859	09h 25m 42.5s	+34° 24' 48"	10.9	Galaxy	4.6 x 4.1
NGC3193	10h 19m 40.8s	+21° 46' 41"	10.9	Galaxy	2.0
NGC4096	12h 07m 10.7s	+47° 20' 52"	10.9	Galaxy	6.5 x 1.8
NGC4143	12h 10m 45.7s	+42° 24' 23"	10.9	Galaxy	2.3 x 1.4
NGC4203	12h 16m 14.4s	+33° 04' 11"	10.9	Galaxy	3.5 x 3.2
NGC3414	10h 52m 31.6s	+27° 51' 09"	11.0	Galaxy	3.5 x 2.6

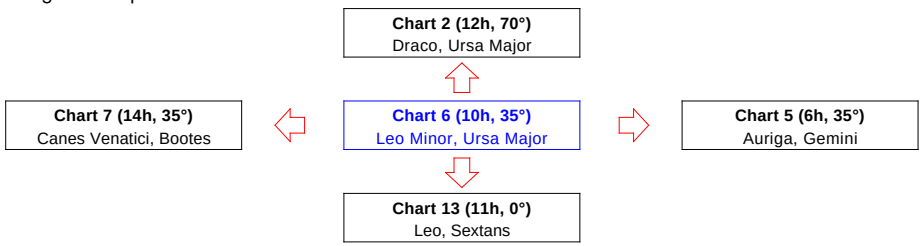
Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
STFA 18 (Adhafera)	10h 19m 13.9s	+23° 11' 10"	3.46 / 6.03	331.3 / 337
STF 1268 (ι Cnc)	08h 49m 28.4s	+28° 35' 19"	4.13 / 5.99	30.7 / 308
DRS 47 AD	11h 21m 37.7s	+37° 56' 01"	4.77 / 7.25	500.1 / 128
SMA 75 AB	10h 46m 15.0s	+45° 57' 41"	5.21 / 7.35	288.0 / 88
SHY 204 (o_1 Cnc)	08h 59m 48.4s	+15° 08' 34"	5.24 / 5.70	975.6 / 17
FOR 1 AB (67 UMa)	12h 04m 27.6s	+42° 47' 22"	5.24 / 6.72	274.4 / 62
ARN 5 AC	12h 04m 27.6s	+42° 47' 22"	5.24 / 8.47	375.9 / 25
S 612 AB (42 LMi)	10h 48m 24.8s	+30° 26' 21"	5.34 / 7.78	196.4 / 174
ARN 3 AC	10h 48m 24.8s	+30° 26' 21"	5.34 / 8.31	424.6 / 94
STF 1543 AD	11h 31m 31.9s	+39° 04' 59"	5.36 / 7.73	344.0 / 252
S 598 AB (41 Lyn)	09h 31m 39.5s	+45° 23' 54"	5.50 / 7.80	69.7 / 160
HZG 8 AC	11h 07m 03.8s	+37° 59' 33"	6.04 / 7.56	150.1 / 83
TOK 530 (13 LMi)	09h 45m 28.5s	+34° 52' 52"	6.16 / 8.31	336.7 / 205
ARN 71 AD	09h 23m 53.9s	+51° 04' 06"	6.19 / 7.89	230.7 / 51
S 574 (ϵ Cnc)	08h 43m 05.0s	+19° 22' 43"	6.28 / 7.48	134.0 / 250
ENG 37 AB (39 Cnc)	08h 42m 44.4s	+19° 50' 31"	6.47 / 6.58	151.8 / 150
HJ 460 AC	08h 55m 14.3s	+28° 04' 59"	6.47 / 6.04	276.8 / 20
STTA 108 AB (MN UMa)	11h 15m 02.3s	+35° 33' 48"	6.48 / 7.32	161.7 / 68
STF 1254 AC	08h 43m 00.1s	+19° 30' 14"	6.52 / 7.61	62.5 / 343
STF 1561 AD	11h 41m 11.8s	+44° 51' 12"	6.53 / 7.56	718.2 / 76
STF 1520	11h 18m 40.3s	+52° 31' 17"	6.54 / 7.81	12.4 / 344
BU 584 DC	08h 42m 29.0s	+19° 22' 31"	6.67 / 7.47	99.5 / 89
STF 1579 AB,D	11h 57m 28.5s	+46° 13' 15"	6.68 / 6.97	62.5 / 114
FOR 1 BC	12h 04m 49.5s	+42° 49' 41"	6.72 / 8.47	227.3 / 339
STTA 89	07h 53m 54.7s	+31° 29' 35"	6.83 / 7.69	76.6 / 84
SHY 212	09h 42m 44.1s	+35° 07' 31"	6.95 / 7.18	494.4 / 228
STF 1369 AB (DI Lyn)	09h 38m 13.5s	+39° 45' 20"	6.98 / 7.98	25.1 / 150
STF 1369 AC	09h 38m 13.5s	+39° 45' 20"	6.98 / 8.42	116.3 / 323

Main variable stars

Name	RA (J2023)	DEC	Magnitude	Max/Per (d)	Type
X Cnc	08h 56m 40.4s	+17° 08' 32"	5.6 / 7.5	195	P - Semi-irr
ST UMa	11h 29m 05.3s	+45° 03' 30"	6.0 / 7.6	110	P - Semi-irr
TX UMa	10h 46m 41.2s	+45° 26' 42"	7.06 / 8.80	3.06	Ecl - Algol
Y Lyn	07h 29m 51.7s	+45° 56' 31"	7.8 / 10.3	110	P - Semi-irr
T Gem	07h 50m 40.8s	+23° 40' 31"	8.0 / 15.0	Jan 22, Nov 6 / 288	P - Mira
R LMi	09h 46m 56.6s	+34° 24' 18"	6.3 / 13.2	Jun 6 / 372	P - Mira

Navigation map

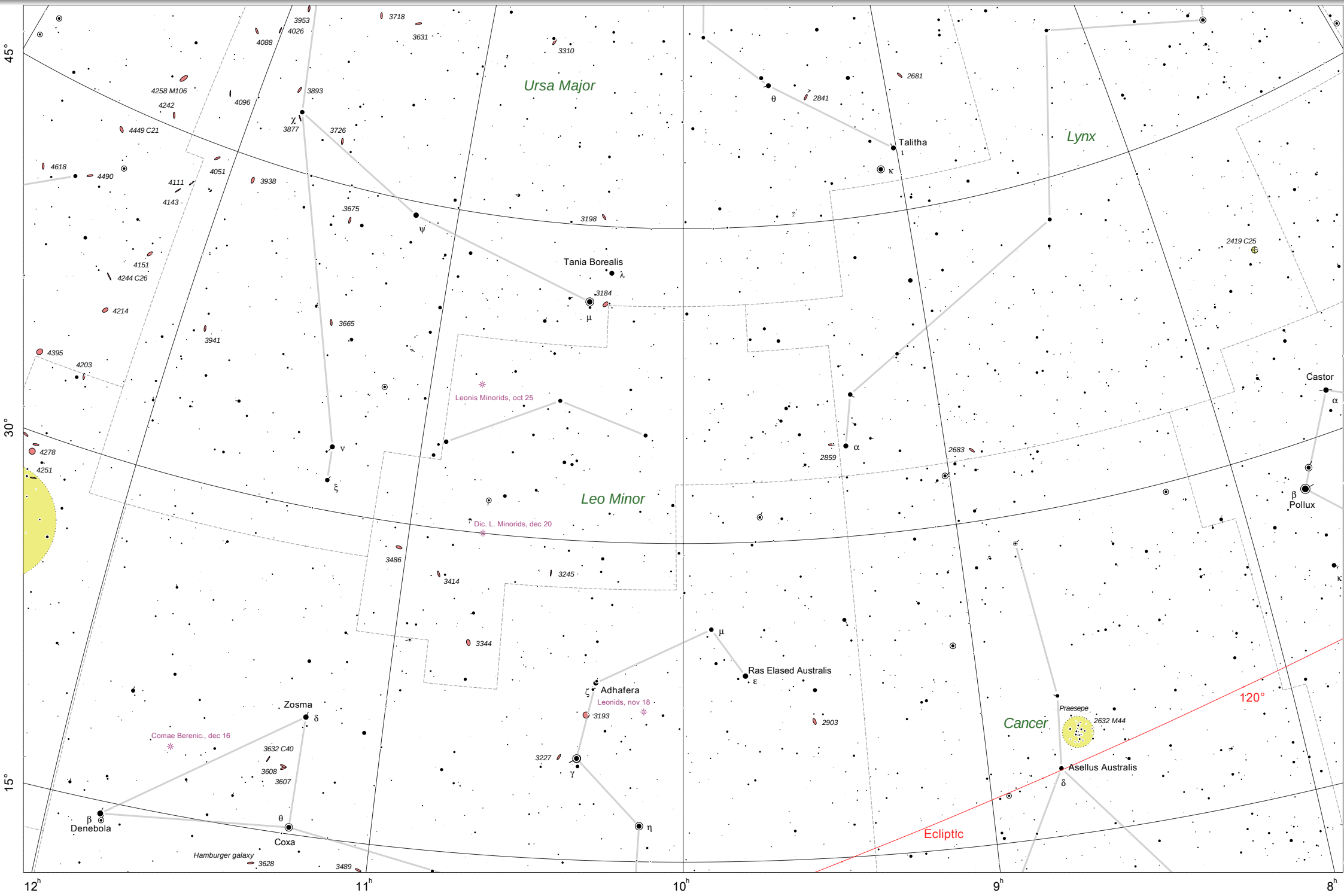


Stellar magnitudes: -1 0 1 2 3 4 5 6 7 8

Types of stars: Double Variable

Symbols for deep sky objects (star cluster, nebula, galaxy) and constellation figure/boundary: Open cluster Globular Nebulose Milky Way Plan.neb. Galaxy Constellation Const. limit Meteors

Chart 6, 30º around 10.0h, 35.0º (Leo Minor, Ursa Major, Lynx, Cancer)



Main objects visible on chart 7

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
Mel111 - Berenice Hair	12h 23m 39.2s	+25° 43' 21"	2.7	Open cluster	4.58°
NGC5272 M3	13h 43m 14.7s	+28° 15' 39"	6.3	Globular cluster	18.0
NGC5024 M53	13h 14m 02.9s	+18° 02' 54"	7.7	Globular cluster	13.0
NGC5457 M101 - Pinwheel galaxy	14h 04m 01.2s	+54° 14' 22"	7.9	Galaxy	28.8 x 26.9
NGC4736 M94	12h 51m 57.9s	+40° 59' 48"	8.2	Galaxy	14.4 x 12.1
NGC4258 M106	12h 20m 05.7s	+47° 10' 46"	8.4	Galaxy	18.6 x 7.2
NGC5194 M51 - Whirlpool galaxy	13h 30m 50.6s	+47° 04' 38"	8.4	Galaxy	11.2 x 6.9
NGC4826 M64 - Black Eye galaxy	12h 57m 51.5s	+21° 33' 32"	8.5	Galaxy	10.0 x 5.4
NGC5055 M63 - Sunflower galaxy	13h 16m 50.7s	+41° 54' 43"	8.6	Galaxy	12.6 x 7.2
NGC4406 M86	12h 27m 21.4s	+12° 49' 09"	8.9	Galaxy	8.9 x 5.8
NGC5053	13h 17m 34.5s	+17° 34' 40"	9.0	Globular cluster	10.0
NGC4374 M84 - Markarian chain	12h 26m 13.5s	+12° 45' 35"	9.1	Galaxy	6.5 x 5.6
NGC4382 M85	12h 26m 33.5s	+18° 03' 49"	9.1	Galaxy	7.1 x 5.5
NGC4631 CALDWELL 32 - Whale galaxy	12h 43m 14.7s	+32° 24' 57"	9.2	Galaxy	15.2 x 2.8
NGC5466	14h 06m 29.3s	+28° 25' 33"	9.2	Globular cluster	9.0
NGC4321 M100	12h 24m 04.7s	+15° 41' 43"	9.4	Galaxy	7.5 x 6.1
NGC4725	12h 51m 34.0s	+25° 22' 30"	9.4	Galaxy	10.7 x 7.6
NGC6229	16h 47m 37.8s	+47° 29' 18"	9.4	Globular cluster	4.5
NGC4569 M90	12h 37m 59.6s	+13° 02' 15"	9.5	Galaxy	9.5 x 4.4
NGC4449 CALDWELL 21	12h 29m 18.3s	+43° 58' 05"	9.6	Galaxy	6.2 x 4.4
NGC4501 M88	12h 33m 08.6s	+14° 17' 35"	9.6	Galaxy	6.8 x 3.7
NGC4565 CALDWELL 38 - Needle galaxy	12h 37m 28.8s	+25° 51' 41"	9.6	Galaxy	15.8 x 2.1
NGC5195	13h 30m 57.2s	+47° 08' 57"	9.6	Galaxy	5.9 x 4.6
NGC4214	12h 16m 47.9s	+36° 11' 59"	9.8	Galaxy	8.0 x 6.6
NGC4490	12h 31m 43.1s	+41° 30' 57"	9.8	Galaxy	6.4 x 3.2
NGC4494	12h 32m 32.8s	+25° 38' 55"	9.8	Galaxy	4.8 x 3.5
NGC5005 CALDWELL 29	13h 11m 59.7s	+36° 56' 12"	9.8	Galaxy	5.8 x 2.9
NGC4254 M99	12h 19m 59.4s	+14° 17' 24"	9.9	Galaxy	5.3 x 4.6
NGC4216	12h 17m 04.2s	+13° 01' 12"	10.0	Galaxy	8.1 x 1.8
NGC4559 CALDWELL 36	12h 37m 05.9s	+27° 49' 60"	10.0	Galaxy	10.7 x 4.4
NGC4192 M98	12h 14m 58.0s	+14° 46' 18"	10.1	Galaxy	9.8 x 2.8
NGC4414	12h 27m 35.6s	+31° 05' 47"	10.1	Galaxy	4.4 x 3.0
NGC4450	12h 29m 38.8s	+16° 57' 26"	10.1	Galaxy	5.4 x 4.1
NGC3675	11h 27m 23.0s	+43° 27' 35"	10.2	Galaxy	5.9 x 3.1
NGC4051	12h 04m 19.8s	+44° 24' 14"	10.2	Galaxy	5.2 x 3.9
NGC4278	12h 21m 15.9s	+29° 09' 10"	10.2	Galaxy	3.8
NGC4395	12h 26m 57.2s	+33° 25' 10"	10.2	Galaxy	13.2 x 11.0
NGC4438 - The Eyes	12h 28m 55.5s	+12° 52' 54"	10.2	Galaxy	8.5 x 3.0
NGC4473	12h 30m 58.5s	+13° 18' 10"	10.2	Galaxy	4.5 x 2.5
NGC4548 M91	12h 36m 35.9s	+14° 22' 12"	10.2	Galaxy	5.2 x 4.2
NGC5033	13h 14m 31.5s	+36° 28' 19"	10.2	Galaxy	10.7 x 5.0
NGC3941	11h 54m 06.7s	+36° 51' 32"	10.3	Galaxy	3.5 x 2.5
NGC3726	11h 34m 35.3s	+46° 54' 02"	10.4	Galaxy	6.0 x 4.1
NGC3938	11h 54m 00.8s	+43° 59' 36"	10.4	Galaxy	5.4 x 4.9
NGC4153	12h 11m 16.4s	+18° 24' 53"	10.4	Globular cluster	4.4
NGC4244 CALDWELL 26	12h 18m 38.8s	+37° 40' 48"	10.4	Galaxy	16.6 x 1.9
NGC4274	12h 20m 60.0s	+29° 29' 10"	10.4	Galaxy	6.8 x 2.4
NGC4293	12h 22m 22.7s	+18° 15' 19"	10.4	Galaxy	5.6 x 2.6
NGC4459	12h 30m 09.7s	+13° 51' 06"	10.4	Galaxy	3.5 x 2.7
NGC4477	12h 31m 11.7s	+13° 30' 36"	10.4	Galaxy	3.7 x 3.3
NGC3893	11h 49m 50.6s	+48° 35' 01"	10.5	Galaxy	4.5 x 2.8
NGC4656	12h 45m 05.1s	+32° 02' 39"	10.5	Galaxy	15.3 x 2.4
NGC4088	12h 06m 44.3s	+50° 24' 45"	10.6	Galaxy	5.6 x 2.1
NGC4314	12h 23m 40.8s	+29° 46' 06"	10.6	Galaxy	4.2 x 3.7
NGC5371	13h 56m 38.0s	+40° 21' 01"	10.6	Galaxy	4.2 x 3.4
NGC4111	12h 08m 12.7s	+42° 56' 19"	10.7	Galaxy	4.6 x 1.0
NGC4251	12h 19m 17.8s	+28° 02' 52"	10.7	Galaxy	3.6 x 1.5
NGC3665	11h 25m 58.0s	+38° 38' 11"	10.8	Galaxy	4.3 x 3.3
NGC4026	12h 00m 35.7s	+50° 50' 02"	10.8	Galaxy	5.2 x 1.3
NGC4151	12h 11m 41.8s	+39° 16' 44"	10.8	Galaxy	6.3 x 4.5
NGC4242	12h 18m 38.3s	+45° 29' 29"	10.8	Galaxy	5.2 x 4.0
NGC4435 - The Eyes	12h 28m 50.4s	+12° 57' 10"	10.8	Galaxy	3.0 x 2.2
NGC4618	12h 42m 38.8s	+41° 01' 31"	10.8	Galaxy	4.2 x 3.4
NGC4651	12h 44m 51.5s	+16° 16' 05"	10.8	Galaxy	4.0 x 2.7
NGC5474	14h 05m 50.4s	+53° 33' 12"	10.8	Galaxy	4.7
NGC4096	12h 07m 10.7s	+47° 20' 52"	10.9	Galaxy	6.5 x 1.8
NGC4143	12h 10m 45.7s	+42° 24' 23"	10.9	Galaxy	2.3 x 1.4
NGC4203	12h 16m 14.4s	+33° 04' 11"	10.9	Galaxy	3.5 x 3.2
NGC4267	12h 20m 55.4s	+12° 40' 15"	10.9	Galaxy	3.0 x 2.8
NGC4394	12h 27m 05.2s	+18° 05' 13"	10.9	Galaxy	3.4 x 3.2
NGC3877	11h 47m 20.0s	+47° 21' 60"	11.0	Galaxy	5.3 x 1.2

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
NGC4350	12h 25m 07.5s	+16° 33' 58"	11.0	Galaxy	2.9 x 1.6
NGC4388	12h 26m 56.8s	+12° 32' 05"	11.0	Galaxy	5.6 x 1.5
NGC4689	12h 48m 54.9s	+13° 38' 13"	11.0	Galaxy	4.3 x 3.5
NGC4710	12h 50m 47.6s	+15° 02' 23"	11.0	Galaxy	4.9 x 1.2
NGC5353	13h 54m 25.0s	+40° 10' 14"	11.0	Galaxy	2.2 x 1.1
NGC5448	14h 03m 42.9s	+49° 03' 45"	11.0	Galaxy	3.8 x 2.0
NGC5557	14h 19m 23.4s	+36° 23' 18"	11.0	Galaxy	2.4 x 1.9
NGC4889 CALDWELL 35	13h 01m 14.8s	+27° 51' 10"	11.5	Galaxy	2.8 x 2.0

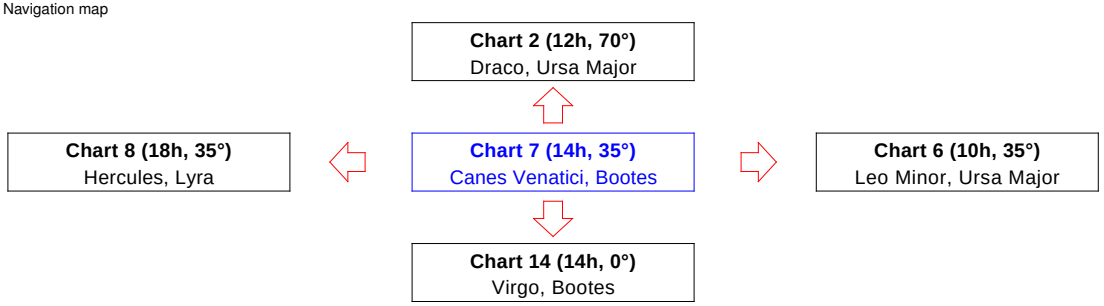
Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
STF 1744 AB (Mizar, Alcor)	13h 25m 44.9s	+54° 41' 13"	2.23 / 3.88	14.6 / 154
STF 1744 AC	13h 25m 44.9s	+54° 41' 13"	2.23 / 4.01	707.7 / 72
SMR 4 AD	13h 25m 44.9s	+54° 41' 13"	2.23 / 7.62	492.8 / 102
STF 1692 AB (Cor Caroli)	12h 58m 11.5s	+38° 04' 13"	2.85 / 5.52	19.5 / 230
STFA 27 AB (δ Boo)	15h 17m 21.0s	+33° 08' 49"	3.56 / 7.89	105.0 / 78
STFA 28 AB (Alkalurops)	15h 26m 14.9s	+37° 13' 01"	4.33 / 7.09	109.0 / 172
STF 1821 AB (κ_2 Boo)	14h 15m 07.4s	+51° 34' 36"	4.53 / 6.62	13.8 / 235
STFA 26 AB (Asellus secondus)	14h 17m 48.3s	+51° 09' 19"	4.76 / 7.39	39.0 / 33
STF 1657 (24 Com)	12h 37m 26.3s	+18° 07' 27"	5.11 / 6.33	20.2 / 272
STFA 21 AB (17 Com)	12h 31m 12.6s	+25° 39' 32"	5.23 / 6.64	146.4 / 251
FOR 1 AB (67 UMa)	12h 04m 27.6s	+42° 47' 22"	5.24 / 6.72	274.4 / 62
ARN 5 AC	12h 04m 27.6s	+42° 47' 22"	5.24 / 8.47	375.9 / 25
STF 1543 AD	11h 31m 31.9s	+39° 04' 59"	5.36 / 7.73	344.0 / 252
STFA 29 AB (ν_1 CrB)	16h 24m 05.0s	+33° 41' 39"	5.39 / 5.58	354.7 / 164
HJL 1087 (22 Boo)	14h 28m 35.7s	+19° 01' 20"	5.43 / 8.38	224.4 / 254
STF 1772 AD	13h 42m 51.9s	+19° 43' 28"	5.76 / 7.38	208.4 / 1
STFA 24 AB (17 CVn)	13h 12m 09.6s	+38° 15' 18"	5.95 / 6.26	275.6 / 296
BUP 143 AC	12h 32m 14.0s	+51° 16' 55"	6.21 / 8.45	217.5 / 333
BGH 46 AB	13h 18m 46.2s	+19° 32' 38"	6.46 / 7.59	202.9 / 58
STFA 23 AB (32 Com)	12h 54m 29.1s	+16° 49' 29"	6.50 / 6.99	196.3 / 51
STF 1561 AD	11h 41m 11.8s	+44° 51' 12"	6.53 / 7.56	718.2 / 76
STF 1579 AB,D	11h 57m 28.5s	+46° 13' 15"	6.68 / 6.97	62.5 / 114
STF 1919	15h 14m 48.4s	+19° 06' 58"	6.71 / 7.38	23.4 / 11
FOR 1 BC	12h 04m 49.5s	+42° 49' 41"	6.72 / 8.47	227.3 / 339
ARN 8 AB,D	13h 34m 55.4s	+34° 40' 20"	6.81 / 8.40	351.6 / 259

Main variable stars

Name	RA (J2023)	DEC	Magnitude	Maximum / Period (d)	Type
Y CVn	12h 46m 12.4s	+45° 18' 53"	7.4 / 10.0	157	P - Semi-irr
TU CVn	12h 55m 59.3s	+47° 04' 21"	5.55 / 6.6	50	P - Semi-irr
ST UMa	11h 29m 05.3s	+45° 03' 30"	6.0 / 7.6	110	P - Semi-irr
ZZ Boo	13h 57m 12.8s	+25° 48' 25"	6.79 / 7.44	4.99	Ecl - Algol
V CVn	13h 20m 27.7s	+45° 24' 24"	6.52 / 8.56	Mar 28, Oct 6 / 191.89	P - Semi-irr
U CrB	15h 19m 07.7s	+31° 33' 51"	7.66 / 8.79	3.45	Ecl - Algol
V Boo	14h 30m 41.0s	+38° 45' 35"	7.0 / 12.0	Jun 18 / 258.01	P - Semi-irr
S CrB	15h 22m 20.2s	+31° 17' 09"	5.8 / 14.1	Jul 23 / 360.26	P - Mira
R Boo	14h 38m 12.5s	+26° 38' 16"	6.2 / 13.1	Jan 15, Aug 27 / 223.40	P - Mira
SX Her	16h 08m 25.4s	+24° 50' 53"	8.6 / 10.9	102.90	P - Semi-irr

Navigation map

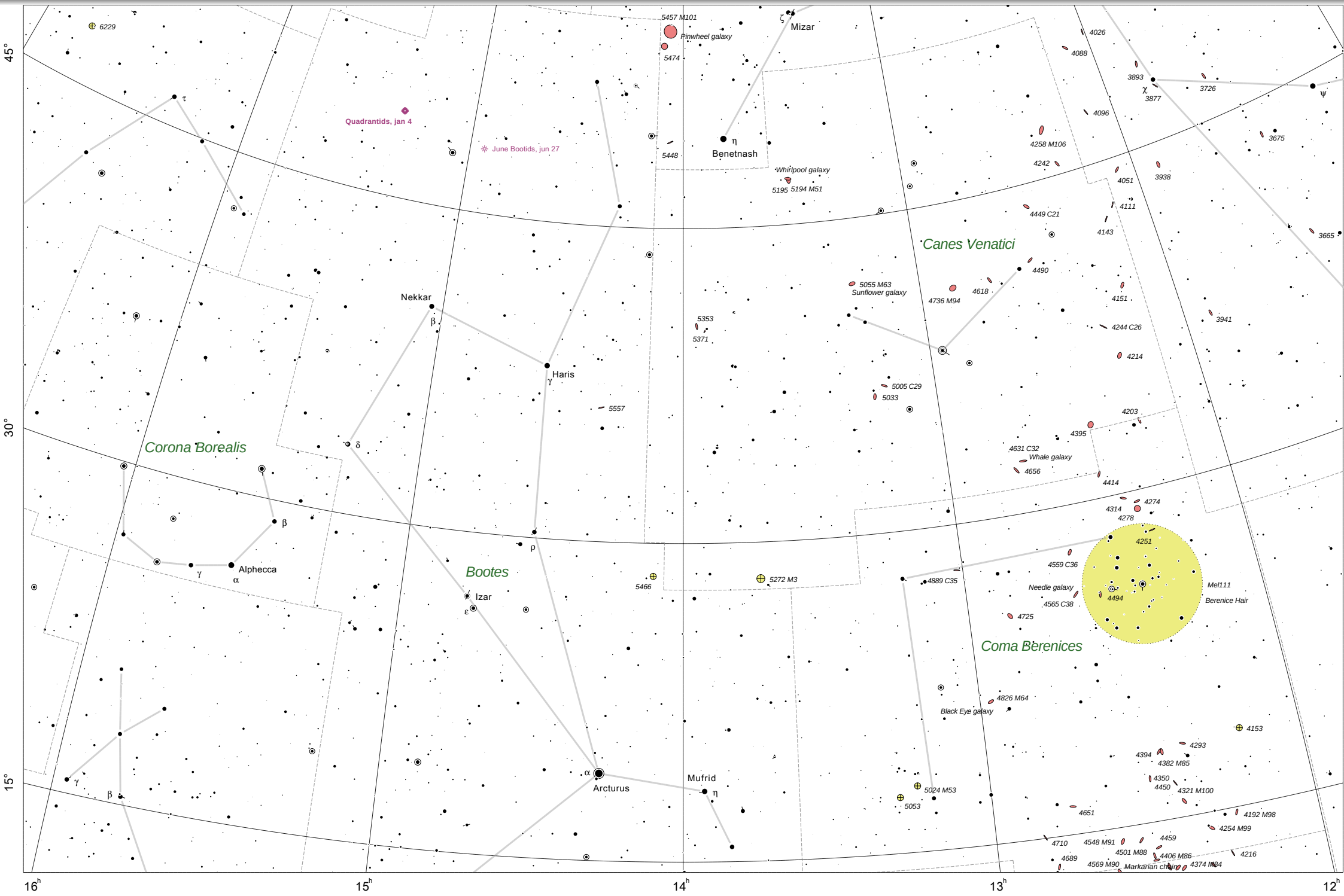


Stellar magnitudes: -1 0 1 2 3 4 5 6 7 8

Types of stars: Double Variable

Symbols for deep sky objects (star cluster, nebula, galaxy) and constellation figure/boundary: Open cluster Globular Nebulose Milky Way Plan.neb. Galaxy Constellation Const. limit Meteors

Chart 7, 30º around 14.0h, 35.0º (Canes Venatici, Bootes, Ursa Major, Coma Berenices)



Main objects visible on chart 8

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
NGC6888 CALDWELL 27 - Crescent nebula	20h 12m 56.8s	+38° 25' 30"		Nebula	18.0 x 13.0
Col399	19h 26m 24.2s	+20° 13' 49"	3.6	Open cluster	60.0
NGC7000 CALDWELL 20 - North America nebul	21h 00m 07.3s	+44° 36' 26"	5.0	Nebula	2.0° x 1.67°
NGC6871	20h 07m 18.9s	+35° 51' 26"	5.2	Open cluster	30.0
Stock1	19h 36m 45.5s	+25° 16' 08"	5.3	Open cluster	60.0
Cr419	20h 18m 49.1s	+40° 37' 22"	5.4	Open cluster	45.0
NGC6205 M13 - Hercules cluster	16h 42m 30.8s	+36° 25' 05"	5.8	Globular cluster	20.0
NGC6341 M92	17h 17m 49.7s	+43° 06' 48"	6.5	Globular cluster	14.0
NGC6913 M29	20h 24m 57.0s	+38° 34' 08"	6.6	Open cluster	10.0
NGC6811	19h 37m 50.9s	+46° 25' 42"	6.8	Open cluster	15.0
NGC6823	19h 44m 08.8s	+23° 21' 21"	7.1	Open cluster	7.0
NGC6819	19h 42m 05.3s	+40° 14' 18"	7.3	Open cluster	5.0
IC4996	20h 17m 22.8s	+37° 42' 54"	7.3	Open cluster	7.0
NGC6853 M27 - Dumbbell nebula	20h 00m 35.9s	+22° 47' 09"	7.4	Planetary nebula	6.7
NGC6910	20h 24m 01.2s	+40° 51' 13"	7.4	Open cluster	10.0
NGC6866	20h 04m 40.2s	+44° 13' 31"	7.6	Open cluster	7.0
NGC6834	19h 53m 07.9s	+29° 28' 07"	7.8	Open cluster	6.0
NGC6830	19h 51m 59.1s	+23° 09' 36"	7.9	Open cluster	6.0
NGC6883	20h 12m 10.1s	+35° 55' 11"	8.0	Open cluster	35.0
NGC6885 CALDWELL 37	20h 12m 55.9s	+26° 33' 12"	8.1	Open cluster	20.0
NGC6779 M56	19h 17m 29.3s	+30° 13' 39"	8.4	Globular cluster	8.8
NGC6838 M71	19h 54m 47.6s	+18° 50' 24"	8.4	Globular cluster	7.2
NGC6210	16h 45m 27.4s	+23° 45' 34"	8.8	Planetary nebula	21.0"
NGC6720 M57 - Ring nebula	18h 54m 26.4s	+33° 03' 35"	8.8	Planetary nebula	3.0 x 2.4
NGC6802	19h 31m 36.3s	+20° 18' 40"	8.8	Open cluster	5.0
NGC6826 CALDWELL 15 - Blinking planetary	19h 45m 25.4s	+50° 34' 56"	8.8	Planetary nebula	36.0"
NGC6229	16h 47m 37.8s	+47° 29' 18"	9.4	Globular cluster	4.5
NGC6791	19h 21m 41.1s	+37° 49' 07"	9.5	Open cluster	10.0
NGC6996	20h 57m 18.3s	+45° 33' 46"	10.0	Open cluster	5.0
NGC6997	20h 57m 18.9s	+44° 44' 22"	10.0	Open cluster	8.0
IC4593	16h 12m 49.4s	+12° 00' 50"	10.7	Planetary nebula	42.0"
NGC6766	20h 11m 07.2s	+46° 31' 51"	10.9	Planetary nebula	15.0"
NGC6793	19h 24m 11.6s	+22° 12' 12"	11.0	Open cluster	7.0
NGC6874	20h 08m 38.2s	+38° 18' 05"	11.0	Open cluster	7.0

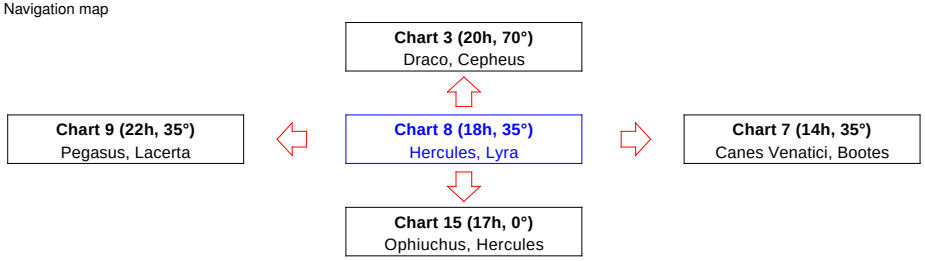
Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
STF 3127 AB (Sarin)	17h 16m 55.6s	+24° 47' 26"	3.12 / 8.30	13.7 / 293
STFA 43 AB (Albireo)	19h 32m 34.3s	+28° 03' 34"	3.19 / 4.68	34.6 / 54
STFA 39 AB (Sheliak)	18h 51m 46.9s	+33° 25' 09"	3.63 / 6.69	45.7 / 149
STFA 50 AC	20h 15m 04.9s	+46° 52' 59"	3.93 / 6.97	108.6 / 173
STFA 50 AD	20h 15m 04.9s	+46° 52' 59"	3.93 / 4.83	336.7 / 322
S 743 (32 Cyg)	20h 16m 53.3s	+47° 51' 27"	4.16 / 8.36	208.5 / 175
STFA 38 AD	18h 46m 21.0s	+37° 39' 20"	4.34 / 5.62	43.7 / 150
STFA 42 (Anser)	19h 30m 37.3s	+24° 45' 46"	4.61 / 5.93	427.7 / 28
STFA 37 AB,CD (Quadruple)	18h 45m 51.4s	+39° 43' 12"	4.67 / 4.56	209.5 / 172
GUI 30 DC	20h 14m 44.7s	+46° 57' 25"	4.83 / 6.97	431.8 / 150
STFA 35 (ν_2 Dra)	17h 33m 09.8s	+55° 08' 33"	4.87 / 4.90	62.1 / 311
ENG 72 AB (29 Cyg)	20h 16m 15.2s	+36° 56' 55"	4.96 / 6.71	215.3 / 155
WNO 56 AF	19h 48m 10.8s	+33° 50' 35"	5.06 / 8.48	792.0 / 235
STF 2010 AB (Marfik)	16h 10m 09.8s	+16° 55' 40"	5.10 / 6.21	27.0 / 14
STFA 37 AD	18h 45m 51.4s	+39° 43' 12"	5.15 / 5.38	210.5 / 172
STFA 30 AC	16h 37m 19.5s	+52° 50' 01"	5.38 / 5.50	90.2 / 193
STFA 29 AB (ν_1 CrB)	16h 24m 05.0s	+33° 41' 39"	5.39 / 5.58	354.7 / 164
STTA 178	19h 17m 25.8s	+15° 10' 03"	5.69 / 7.64	89.6 / 267
H 6 26 AB (ϵ Sge)	19h 39m 21.9s	+16° 34' 09"	5.77 / 8.35	87.4 / 82
STF 2280 AB (100 Her)	18h 09m 41.4s	+26° 06' 39"	5.81 / 5.84	14.3 / 183
STFA 46 AB (16 Cyg)	19h 43m 03.0s	+50° 38' 10"	6.00 / 6.23	39.5 / 132
STFA 37 BC	18h 45m 51.4s	+39° 43' 14"	6.10 / 5.25	210.9 / 172
STFA 37 BD	18h 45m 51.4s	+39° 43' 14"	6.10 / 5.38	209.6 / 172
SHJ 282 AC	18h 56m 34.2s	+34° 01' 49"	6.14 / 7.60	45.4 / 350
SHY 713 (63 Her)	17h 12m 57.4s	+24° 11' 03"	6.22 / 6.98	195.5 / 74

Main variable stars

Name	RA (J2023)	DEC	Magnitude	Maximum / Period (d)	Type
Sheliak (β Lyr)	18h 50m 55.8s	+33° 23' 26"	3.25 / 4.36	12.91	Ecl - β Lyr
R Lyr	18h 56m 02.1s	+43° 58' 39"	3.88 / 5.0	46	P - Semi-irr
P Cyg	20h 18m 38.1s	+38° 06' 20"	3 / 6		Er
XY Lyr	18h 38m 52.1s	+39° 41' 23"	5.80 / 6.35		P - Irr Superg
CH Cyg	19h 25m 09.3s	+50° 17' 15"	5.60 / 8.49		Er - U Gem
U Sge	19h 19m 48.8s	+19° 39' 14"	6.45 / 9.28	3.38	Ecl - Algol
AF Cyg	19h 30m 54.1s	+46° 11' 49"	7.4 / 9.4	92.5	P - Semi-irr
SU Cyg	19h 45m 44.0s	+29° 19' 17"	6.44 / 7.22	3.85	P - δ Cep
U Vul	19h 37m 38.1s	+20° 23' 08"	6.73 / 7.54	7.99	P - δ Cep
S Her	16h 52m 56.8s	+14° 54' 17"	6.4 / 13.8	Apr 23 / 307.28	P - Mira
RS Cyg	20h 14m 13.8s	+38° 47' 59"	6.5 / 9.5	Dec 29 / 417.39	P - Semi-irr
RT Cyg	19h 44m 16.9s	+48° 50' 04"	6.0 / 13.1	Feb 12, Aug 21 / 190.28	P - Mira
R Cyg	19h 37m 26.4s	+50° 15' 09"	6.1 / 14.4	Mar 1 / 426.45	P - Mira
SX Her	16h 08m 25.4s	+24° 50' 53"	8.6 / 10.9	102.90	P - Semi-irr
U Cyg	20h 20m 19.4s	+47° 58' 03"	5.9 / 12.1	463.24	P - Mira
U Her	16h 26m 48.5s	+18° 50' 29"	6.4 / 13.4	Jan 19 / 406.10	P - Mira

Navigation map

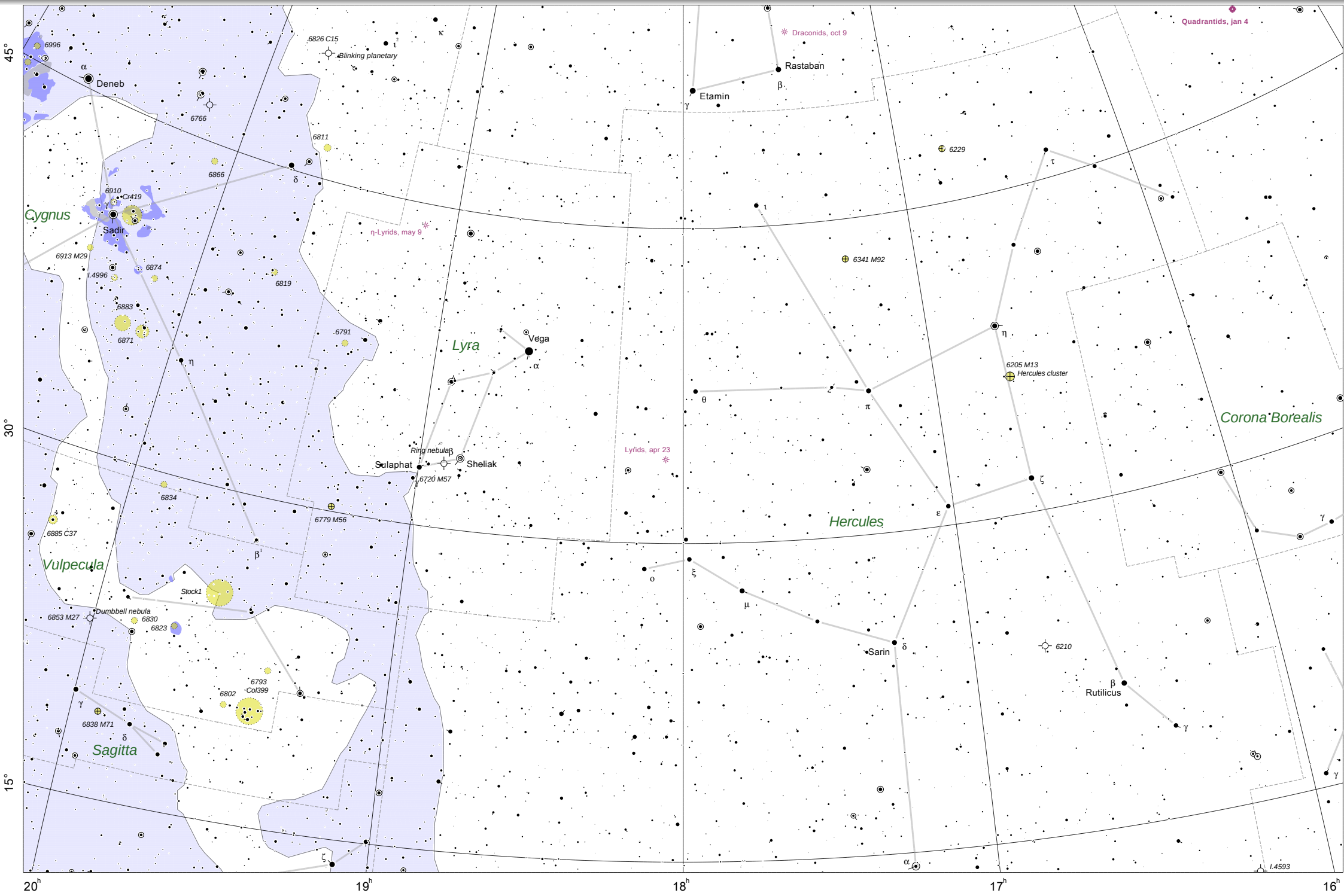


Stellar magnitudes: -1 0 1 2 3 4 5 6 7 8

Types of stars: Double Variable

Symbols for deep sky objects (star cluster, nebula, galaxy) and constellation figure/boundary: Open cluster Globular Nebulose Milky Way Plan.neb. Galaxy Constellation Const. limit Meteors

Chart 8, 30º around 18.0h, 35.0º (Hercules, Lyra, Cygnus, Draco)



Main objects visible on chart 9

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
IC5146 CALDWELL 19 - Cocoon nebula	21h 54m 17.3s	+47° 22' 33"		Nebula	10.0
NGC6992 CALDWELL 33	20h 57m 15.1s	+31° 49' 51"		Nebula	60.0 x 8.0
NGC6960 CALDWELL 34 - Veil nebula	20h 46m 39.0s	+30° 48' 06"		Nebula	70.0 x 6.0
NGC6888 CALDWELL 27 - Crescent nebula	20h 12m 56.8s	+38° 25' 30"		Nebula	18.0 x 13.0
NGC224 M31 - Andromeda nebula	00h 44m 00.1s	+41° 23' 41"	3.4	Galaxy	3.15° x 1.03°
NGC7092 M39	21h 32m 41.9s	+48° 31' 38"	4.6	Open cluster	31.0
NGC7000 CALDWELL 20 - North America nebula	21h 00m 07.3s	+44° 36' 26"	5.0	Nebula	2.0° x 1.67°
NGC6871	20h 07m 18.9s	+35° 51' 26"	5.2	Open cluster	30.0
Cr419	20h 18m 49.1s	+40° 37' 22"	5.4	Open cluster	45.0
NGC7686	23h 31m 13.5s	+49° 15' 40"	5.6	Open cluster	15.0
NGC6940	20h 35m 30.1s	+28° 21' 38"	6.3	Open cluster	25.0
NGC7243 CALDWELL 16	22h 16m 03.1s	+50° 00' 45"	6.4	Open cluster	30.0
NGC6913 M29	20h 24m 57.0s	+38° 34' 08"	6.6	Open cluster	10.0
NGC6811	19h 37m 50.9s	+46° 25' 42"	6.8	Open cluster	15.0
NGC7063	21h 25m 18.5s	+36° 35' 11"	7.0	Open cluster	9.0
NGC7082	21h 30m 07.5s	+47° 13' 41"	7.2	Open cluster	24.0
NGC6819	19h 42m 05.3s	+40° 14' 18"	7.3	Open cluster	5.0
IC4996	20h 17m 22.8s	+37° 42' 54"	7.3	Open cluster	7.0
NGC6853 M27 - Dumbbell nebula	20h 00m 35.9s	+22° 47' 09"	7.4	Planetary nebula	6.7
NGC6910	20h 24m 01.2s	+40° 51' 13"	7.4	Open cluster	10.0
NGC6866	20h 04m 40.2s	+44° 13' 31"	7.6	Open cluster	7.0
NGC7039	21h 12m 01.6s	+45° 44' 42"	7.6	Open cluster	15.0
NGC7209	22h 06m 03.2s	+46° 35' 45"	7.7	Open cluster	15.0
NGC6834	19h 53m 07.9s	+29° 28' 07"	7.8	Open cluster	6.0
NGC6830	19h 51m 59.1s	+23° 09' 36"	7.9	Open cluster	6.0
NGC6883	20h 12m 10.1s	+35° 55' 11"	8.0	Open cluster	35.0
NGC205 M110	00h 41m 37.7s	+41° 48' 41"	8.1	Galaxy	19.5 x 11.5
NGC221 M32	00h 43m 57.5s	+40° 59' 30"	8.1	Galaxy	8.5 x 6.5
NGC6885 CALDWELL 37	20h 12m 55.9s	+26° 33' 12"	8.1	Open cluster	20.0
Stock12	23h 36m 42.5s	+52° 48' 38"	8.1	Open cluster	20.0
NGC7062	21h 24m 17.8s	+46° 28' 41"	8.3	Open cluster	5.0
NGC7662 CALDWELL 22 - Blue snowball	23h 27m 00.5s	+42° 39' 44"	8.3	Planetary nebula	37.2"
NGC6838 M71	19h 54m 47.6s	+18° 50' 24"	8.4	Globular cluster	7.2
NGC7086	21h 31m 14.7s	+51° 42' 09"	8.4	Open cluster	12.0
NGC7027	21h 07m 53.3s	+42° 19' 48"	8.5	Planetary nebula	18.0" x 12.0"
NGC6826 CALDWELL 15 - Blinking planetary	19h 45m 25.4s	+50° 34' 56"	8.8	Planetary nebula	36.0"
IC1369	21h 12m 57.1s	+47° 51' 43"	8.8	Open cluster	5.0
IC1434	22h 11m 22.1s	+52° 56' 50"	9.0	Open cluster	7.0
NGC7296	22h 28m 57.2s	+52° 24' 23"	9.0	Open cluster	4.0
NGC7031	21h 07m 36.9s	+50° 56' 12"	9.1	Open cluster	15.0
IC1442	22h 16m 58.2s	+54° 06' 25"	9.1	Open cluster	5.0
NGC185 CALDWELL 18	00h 40m 14.3s	+48° 27' 48"	9.2	Galaxy	8.0 x 7.0
NGC7245	22h 16m 03.8s	+54° 27' 30"	9.2	Open cluster	5.0
NGC147 CALDWELL 17	00h 34m 27.5s	+48° 38' 02"	9.5	Galaxy	13.2 x 7.8
NGC6791	19h 21m 41.1s	+37° 49' 07"	9.5	Open cluster	10.0
NGC7331 CALDWELL 30	22h 38m 08.4s	+34° 32' 24"	9.5	Galaxy	10.2 x 4.2
NGC7067	21h 25m 01.6s	+48° 06' 40"	9.7	Open cluster	3.0
NGC7128	21h 44m 45.0s	+53° 49' 18"	9.7	Open cluster	4.0
NGC6996	20h 57m 18.3s	+45° 33' 46"	10.0	Open cluster	5.0
NGC6997	20h 57m 18.9s	+44° 44' 22"	10.0	Open cluster	8.0
NGC7217	22h 08m 54.0s	+31° 28' 21"	10.1	Galaxy	4.0 x 3.4
NGC6891	20h 16m 13.9s	+12° 46' 34"	10.5	Planetary nebula	21.0"
IC4997	20h 21m 12.0s	+16° 48' 22"	10.5	Planetary nebula	13.2"
NGC7006 CALDWELL 42	21h 02m 34.0s	+16° 16' 46"	10.6	Globular cluster	3.6
NGC7814 CALDWELL 43	00h 04m 25.7s	+16° 16' 24"	10.6	Galaxy	5.5 x 2.3
NGC7008	21h 01m 13.1s	+54° 38' 05"	10.7	Planetary nebula	1.4
NGC278	00h 53m 22.9s	+47° 40' 32"	10.8	Galaxy	2.1 x 2.0
NGC6766	20h 11m 07.2s	+46° 31' 51"	10.9	Planetary nebula	15.0"
NGC7026	21h 07m 06.0s	+47° 56' 45"	10.9	Planetary nebula	0.8
NGC6874	20h 08m 38.2s	+38° 18' 05"	11.0	Open cluster	7.0
NGC7127	21h 44m 39.4s	+54° 42' 08"	11.0	Open cluster	6.0

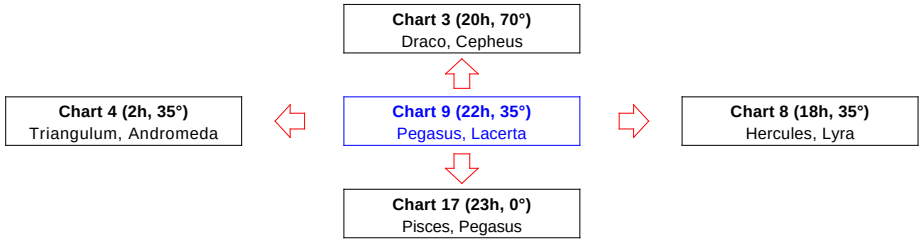
Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
STFA 50 AC	20h 15m 04.9s	+46° 52' 59"	3.93 / 6.97	108.6 / 173
STFA 50 AD	20h 15m 04.9s	+46° 52' 59"	3.93 / 4.83	336.7 / 322
S 743 (32 Cyg)	20h 16m 53.3s	+47° 51' 27"	4.16 / 8.36	208.5 / 175
STF 2822 AD	21h 46m 11.7s	+28° 57' 20"	4.75 / 6.94	197.0 / 43
GUI 30 DC	20h 14m 44.7s	+46° 57' 25"	4.83 / 6.97	431.8 / 150
ENG 72 AB (29 Cyg)	20h 16m 15.2s	+36° 56' 55"	4.96 / 6.71	215.3 / 155
WNO 56 AF	19h 48m 10.8s	+33° 50' 35"	5.06 / 8.48	792.0 / 235
STF 2758 AB (61 Cyg)	21h 08m 41.7s	+38° 56' 12"	5.20 / 6.05	31.8 / 153
STF 2922 AB (8 Lac)	22h 37m 55.3s	+39° 52' 26"	5.66 / 6.29	22.3 / 186
A 1469 AE	22h 37m 55.3s	+39° 52' 26"	5.66 / 7.25	335.2 / 239
S 799 AB (79 Cyg)	21h 45m 20.3s	+38° 29' 46"	5.69 / 7.00	149.5 / 60
STFA 46 AB (16 Cyg)	19h 43m 03.0s	+50° 38' 10"	6.00 / 6.23	39.5 / 132
STF 2822 BD	21h 46m 10.7s	+28° 57' 22"	6.18 / 6.94	196.7 / 45
H 5 137 AB	19h 47m 33.9s	+35° 07' 40"	6.22 / 8.18	38.8 / 25
BOT 3 AC	19h 47m 33.9s	+35° 07' 40"	6.22 / 8.25	443.8 / 76
STFA 53 AB (48 Cyg)	20h 39m 24.3s	+31° 44' 09"	6.29 / 6.54	182.7 / 177
A 1469 BE	22h 37m 55.3s	+39° 52' 03"	6.29 / 7.25	324.0 / 242
ARY 129 AB,C	21h 44m 14.3s	+41° 17' 20"	6.30 / 7.80	145.5 / 132
STF 2578 AB	19h 47m 21.3s	+36° 12' 21"	6.37 / 7.04	14.9 / 125
STTA 207 AC	20h 24m 29.9s	+43° 08' 01"	6.41 / 8.01	85.8 / 65
STF 2841 A,BC	21h 56m 27.0s	+19° 56' 14"	6.45 / 7.99	22.4 / 110
BU 1138 AC	21h 04m 26.3s	+46° 01' 58"	6.46 / 7.82	152.1 / 330
STTA 215 AC	21h 12m 07.0s	+47° 52' 55"	6.55 / 7.52	136.7 / 189
STF 2637 AC	20h 11m 58.6s	+21° 03' 12"	6.56 / 7.52	91.3 / 222
STFA 55 AB	21h 25m 39.9s	+37° 33' 03"	6.61 / 6.61	364.1 / 304

Main variable stars

Name	RA (J2023)	DEC	Magnitude	Maximum / Period (d)	Type
P Cyg	20h 18m 38.1s	+38° 06' 20"	3 / 6		Er
EW Lac	22h 58m 05.8s	+48° 48' 26"	5.22 / 5.48		Er - γ Cas
X Cyg	20h 44m 18.3s	+35° 40' 18"	5.85 / 6.91	16.39	P - δ Cep
U Del	20h 46m 31.4s	+18° 10' 29"	7.6 / 8.9	110	P - Semi-irr
AF Cyg	19h 30m 54.1s	+46° 11' 49"	7.4 / 9.4	92.5	P - Semi-irr
SU Cyg	19h 45m 44.0s	+29° 19' 17"	6.44 / 7.22	3.85	P - δ Cep
DY Vul	21h 04m 31.0s	+24° 05' 18"	8.4 / 9.7		P - Irr Superg
RU Cyg	21h 41m 25.4s	+54° 25' 47"	9.2 / 11.6	Jun 24 / 233.43	P - Semi-irr
TW Peg	22h 05m 02.2s	+28° 27' 38"	7.5 / 8.4	929.3	P - Semi-irr
RS Cyg	20h 14m 13.8s	+38° 47' 59"	6.5 / 9.5	Dec 29 / 417.39	P - Semi-irr
RT Cyg	19h 44m 16.9s	+48° 50' 04"	6.0 / 13.1	Feb 12, Aug 21 / 190.28	P - Mira
R Cyg	19h 37m 26.4s	+50° 15' 09"	6.1 / 14.4	Mar 1 / 426.45	P - Mira
Z Peg	00h 01m 17.4s	+26° 00' 52"	7.3 / 13.6	Jun 29 / 334.8	P - Mira
W Peg	23h 20m 58.6s	+26° 24' 18"	7.6 / 13.0	Apr 15 / 345.5	P - Mira
S Del	20h 44m 08.5s	+17° 10' 19"	8.3 / 12.4	Aug 9 / 277.75	P - Mira
U Cyg	20h 20m 19.4s	+47° 58' 03"	5.9 / 12.1	463.24	P - Mira

Navigation map



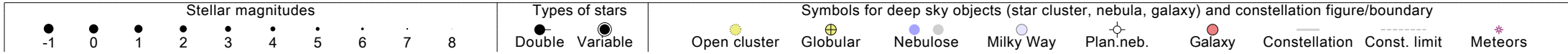
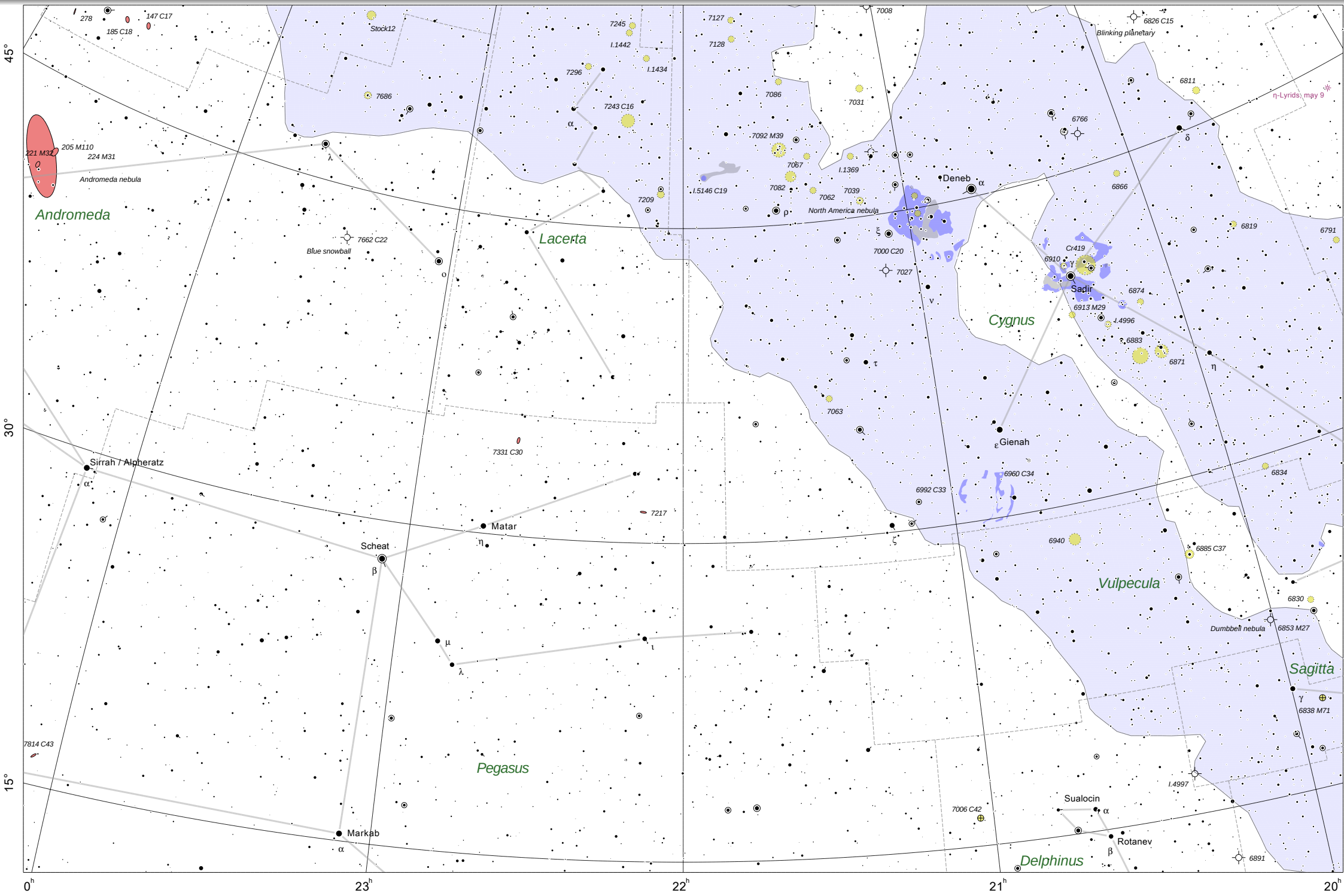


Chart 9, 30º around 22.0h, 35.0º (Pegasus, Lacerta, Cygnus, Vulpecula)



Main objects visible on chart 10

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
NGC1068 M77 - Cetus A	02h 43m 51.5s	+00° 05' 03"	8.9	Galaxy	7.1 x 6.0
IC1613 CALDWELL 51	01h 05m 58.6s	+02° 14' 29"	9.2	Galaxy	16.6 x 14.9
NGC628 M74	01h 37m 56.0s	+15° 54' 00"	9.4	Galaxy	10.5 x 9.5
NGC1407	03h 41m 14.1s	–18° 30' 26"	9.7	Galaxy	4.6 x 4.3
NGC524	01h 26m 00.4s	+09° 39' 28"	10.2	Galaxy	2.8
NGC720	01h 54m 07.6s	–13° 37' 33"	10.2	Galaxy	4.7 x 2.4
NGC936	02h 28m 47.9s	–01° 03' 15"	10.2	Galaxy	4.7 x 4.1
NGC488	01h 22m 58.3s	+05° 22' 32"	10.3	Galaxy	5.4 x 3.9
NGC772	02h 00m 35.5s	+19° 07' 06"	10.3	Galaxy	7.2 x 4.3
NGC157	00h 35m 56.4s	–08° 16' 11"	10.4	Galaxy	3.5 x 2.4
NGC1300	03h 20m 43.1s	–19° 19' 45"	10.4	Galaxy	6.2 x 4.1
NGC584	01h 32m 29.8s	–06° 44' 58"	10.5	Galaxy	4.1 x 2.0
NGC1052	02h 42m 12.5s	–08° 09' 26"	10.5	Galaxy	2.8 x 2.0
NGC1055	02h 42m 56.2s	+00° 32' 24"	10.6	Galaxy	7.6 x 2.7
NGC7814 CALDWELL 43	00h 04m 25.7s	+16° 16' 24"	10.6	Galaxy	5.5 x 2.3
NGC821	02h 09m 34.9s	+11° 06' 09"	10.7	Galaxy	2.4 x 1.7
NGC1084	02h 47m 07.8s	–07° 28' 56"	10.7	Galaxy	2.8 x 1.4
NGC210	00h 41m 44.2s	–13° 44' 47"	10.9	Galaxy	5.0 x 3.3
NGC246 CALDWELL 56 - Skull nebula	00h 48m 12.7s	–11° 44' 46"	10.9	Planetary nebula	4.1
NGC596	01h 34m 01.2s	–06° 54' 52"	10.9	Galaxy	3.2 x 2.0
NGC864	02h 16m 40.1s	+06° 06' 29"	10.9	Galaxy	4.7 x 3.5
NGC1087	02h 47m 35.8s	–00° 24' 13"	10.9	Galaxy	3.9 x 2.3
NGC988	02h 36m 34.9s	–09° 15' 20"	11.0	Galaxy	4.1 x 1.6
NGC1042	02h 41m 31.7s	–08° 20' 11"	11.0	Galaxy	4.3 x 3.6
NGC1073	02h 44m 51.5s	+01° 28' 22"	11.0	Galaxy	4.9 x 4.3
NGC1400	03h 40m 32.9s	–18° 36' 53"	11.0	Galaxy	2.5 x 2.1

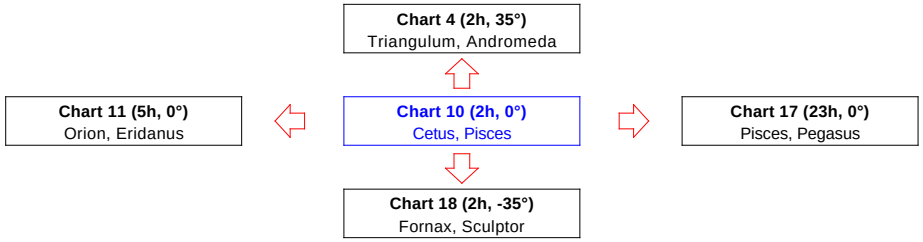
Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
PWL 1 AC	02h 04m 26.0s	+02° 59' 01"	4.10 / 8.25	404.9 / 63
ENG 8 (χ Cet)	01h 51m 51.1s	–10° 27' 35"	4.69 / 6.81	192.9 / 250
STFA 3 AB (37 Cet)	01h 16m 42.7s	–07° 40' 50"	5.19 / 7.85	47.1 / 331
STF 100 AB (ζ Psc)	01h 16m 08.1s	+07° 49' 05"	5.22 / 6.26	22.8 / 63
STU 15 AC	02h 02m 43.9s	–08° 18' 11"	5.66 / 7.03	384.4 / 61
STF 231 AB (66 Cet)	02h 15m 08.1s	–02° 10' 48"	5.72 / 7.71	16.8 / 235
HJ 323	00h 43m 02.6s	–04° 06' 00"	6.01 / 8.46	63.0 / 286
STF 12 (35 Psc)	00h 17m 21.1s	+09° 04' 36"	6.06 / 7.51	11.2 / 148
S 398 AB	01h 30m 47.8s	+08° 11' 53"	6.34 / 8.02	68.9 / 100
STF 90 AB (77 Psc)	01h 08m 12.0s	+05° 09' 14"	6.39 / 7.26	32.7 / 84
STTA 27 AB (VW Ari)	02h 29m 14.4s	+10° 46' 11"	6.72 / 8.31	73.8 / 31
HJ 2052	01h 33m 47.2s	–18° 47' 15"	6.86 / 7.47	80.8 / 114
HJ 1981 A,BC	00h 33m 19.9s	–09° 49' 52"	6.91 / 8.43	78.4 / 89

Main variable stars

Name	RA (J2023)	DEC	Magnitude	Max/Per (d)	Type
Mira Ceti (*o* Cet)	02h 20m 30.6s	–02° 52' 27"	2.0 / 10.1	Jun 28 / 332	P - Mira

Navigation map

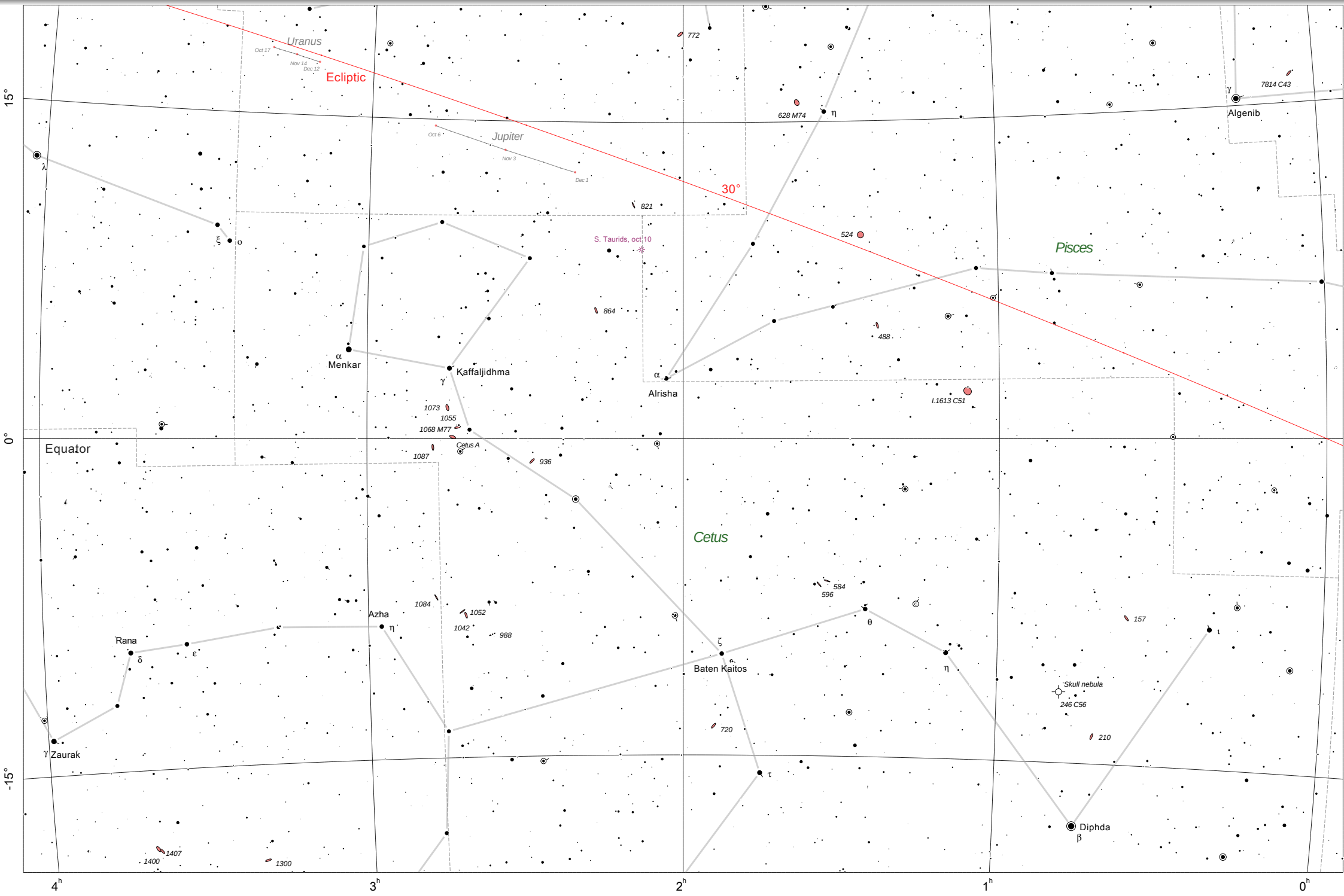


Stellar magnitudes: -1 0 1 2 3 4 5 6 7 8

Types of stars: Double Variable

Symbols for deep sky objects (star cluster, nebula, galaxy) and constellation figure/boundary: Open cluster, Globular, Nebulose, Milky Way, Plan.neb., Galaxy, Constellation, Const. limit, Meteors

Chart 10, 30º around 2.0h, 0.0º (Cetus, Pisces, Aries, Taurus)



Main objects visible on chart 11

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
IC434 - Horsehead nebula	05h 42m 08.4s	–02° 26' 53"		Nebula	16.0 x 12.0
NGC2261 CALDWELL 46 - Hubble's variable n	06h 40m 24.9s	+08° 43' 20"		Nebula	3.0 x 1.0
NGC2237 CALDWELL 49 - Rosette nebula	06h 32m 08.0s	+05° 01' 49"		Nebula	80.0 x 50.0
Cr70	05h 37m 10.1s	–01° 05' 13"	0.6	Open cluster	2.50° x 1.17°
Mel25 CALDWELL 41 - Hyades Cluster	04h 28m 18.8s	+16° 03' 01"	1.0	Open cluster	5.50°
NGC1976 M42 - Orion nebula	05h 36m 24.9s	–05° 22' 37"	4.0	Nebula	40.0 x 35.0
NGC2264 - Christmas Tree cluster	06h 42m 14.2s	+09° 52' 21"	4.1	Open cluster	40.0
NGC1981	05h 36m 20.4s	–04° 25' 11"	4.2	Open cluster	28.0
NGC2232	06h 28m 23.2s	–04° 46' 26"	4.2	Open cluster	45.0
NGC2244 CALDWELL 50	06h 33m 08.4s	+04° 55' 25"	4.8	Open cluster	24.0
NGC2169	06h 09m 42.7s	+13° 57' 35"	5.9	Open cluster	6.0
NGC2323 M50	07h 03m 54.2s	–08° 24' 39"	5.9	Open cluster	15.0
NGC2301	06h 52m 56.2s	+00° 25' 49"	6.0	Open cluster	15.0
NGC1647	04h 47m 03.0s	+19° 09' 35"	6.4	Open cluster	40.0
NGC1662	04h 49m 43.4s	+10° 58' 08"	6.4	Open cluster	12.0
NGC1807	05h 12m 05.6s	+16° 32' 25"	7.0	Open cluster	12.0
NGC2251	06h 35m 53.6s	+08° 20' 48"	7.3	Open cluster	10.0
NGC2286	06h 48m 49.2s	–03° 10' 28"	7.5	Open cluster	15.0
NGC1817	05h 13m 46.8s	+16° 42' 34"	7.7	Open cluster	20.0
NGC2252	06h 36m 24.6s	+05° 24' 02"	7.7	Open cluster	18.0
NGC2068 M78	05h 47m 55.8s	+00° 05' 13"	8.3	Nebula	8.0 x 6.0
NGC2215	06h 21m 56.0s	–07° 17' 45"	8.4	Open cluster	8.0
NGC2194	06h 15m 03.6s	+12° 47' 55"	8.5	Open cluster	9.0
NGC2236	06h 30m 54.0s	+06° 48' 50"	8.5	Open cluster	8.0
NGC2180	06h 10m 49.5s	+04° 42' 23"	8.5	Open cluster	6.0
NGC2204	06h 16m 33.4s	–18° 40' 26"	8.6	Open cluster	10.0
NGC2186	06h 13m 20.8s	+05° 27' 05"	8.7	Open cluster	5.0
NGC2250	06h 34m 57.8s	–05° 06' 13"	8.9	Open cluster	10.0
NGC2302	06h 53m 03.6s	–07° 06' 49"	8.9	Open cluster	2.5
NGC1982 M43	05h 36m 39.2s	–05° 15' 15"	9.0	Nebula	20.0 x 15.0
NGC2219	06h 24m 52.5s	–04° 41' 25"	9.0	Open cluster	10.0
NGC2260	06h 39m 12.9s	–01° 29' 37"	9.0	Open cluster	20.0
NGC2270	06h 45m 10.3s	+03° 27' 16"	9.0	Open cluster	20.0
NGC2112	05h 54m 56.1s	+00° 24' 50"	9.1	Open cluster	18.0
NGC2254	06h 37m 01.4s	+07° 39' 02"	9.1	Open cluster	6.0
Cr96	06h 31m 12.2s	+02° 50' 59"	9.1	Open cluster	8.0
IC418	05h 28m 32.2s	–12° 40' 44"	9.3	Planetary nebula	12.0"
NGC2141	06h 04m 11.4s	+10° 26' 40"	9.4	Open cluster	10.0
NGC1535	04h 15m 20.3s	–12° 40' 56"	9.6	Planetary nebula	0.8
NGC2311	06h 58m 55.8s	–04° 38' 37"	9.6	Open cluster	7.0
NGC1407	03h 41m 14.1s	–18° 30' 26"	9.7	Galaxy	4.6 x 4.3
NGC2269	06h 44m 30.2s	+04° 36' 00"	10.0	Open cluster	3.0
NGC2304	06h 56m 32.2s	+17° 57' 28"	10.0	Open cluster	3.0
NGC2202	06h 18m 04.6s	+05° 59' 13"	10.0	Open cluster	7.0
NGC2306	06h 55m 36.4s	–07° 13' 45"	10.0	Open cluster	
NGC1300	03h 20m 43.1s	–19° 19' 45"	10.4	Galaxy	6.2 x 4.1
NGC2309	06h 57m 10.6s	–07° 12' 21"	10.5	Open cluster	5.0
IC2165	06h 22m 46.4s	–12° 59' 57"	10.5	Planetary nebula	28.2"
NGC1637	04h 42m 37.5s	–02° 48' 54"	10.8	Galaxy	3.3 x 2.7
NGC2259	06h 39m 49.8s	+10° 51' 39"	10.8	Open cluster	3.5

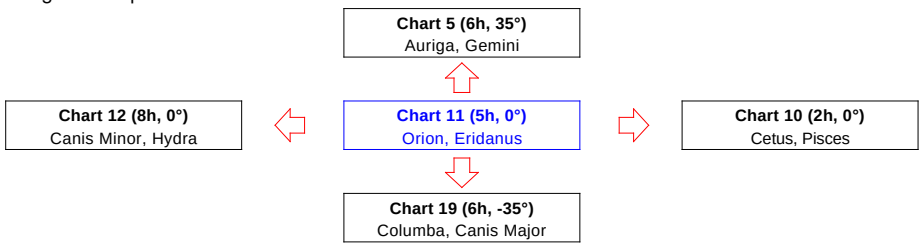
Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
STFA 14 AC	05h 34m 21.1s	–00° 16' 09"	2.41 / 6.83	56.2 / 4
STF 752 AB (Nair al saif)	05h 37m 41.1s	–05° 53' 02"	2.77 / 7.73	12.5 / 146
STFA 10 AB (θ_2 Tau)	04h 31m 17.6s	+15° 58' 08"	3.41 / 3.94	347.9 / 339
STF 762 AB,D	05h 41m 03.7s	–02° 34' 39"	3.76 / 6.56	12.9 / 84
STF 762 AB,E	05h 41m 03.7s	–02° 34' 39"	3.76 / 6.34	41.4 / 62
STF 3135 AB,F	05h 41m 03.7s	–02° 34' 39"	3.76 / 7.86	208.0 / 324
SHJ 65 AB,H	05h 41m 03.7s	–02° 34' 39"	3.76 / 8.06	306.9 / 125
SHJ 65 AB,I	05h 41m 03.7s	–02° 34' 39"	3.76 / 8.44	524.7 / 60
SHJ 45 AB (88 Tau)	04h 38m 10.8s	+10° 15' 06"	4.27 / 7.84	69.2 / 300
STF 900 AB (ϵ Mon)	06h 26m 12.3s	+04° 33' 54"	4.42 / 6.64	12.2 / 30
STFA 11 (σ_2 Tau)	04h 41m 54.0s	+16° 00' 18"	4.69 / 5.09	444.0 / 194
STF 747 AB	05h 37m 18.0s	–05° 58' 31"	4.70 / 5.51	36.3 / 224
LDS 2246 AB	04h 33m 12.0s	+16° 17' 24"	4.78 / 6.54	250.3 / 131
STF 696 (23 Ori)	05h 25m 15.2s	+03° 35' 04"	4.95 / 6.76	32.0 / 29
STFA 16 AB (θ_2 Ori)	05h 37m 38.7s	–05° 23' 24"	5.03 / 6.19	52.3 / 94
STFA 16 AC	05h 37m 38.7s	–05° 23' 24"	5.03 / 8.46	128.5 / 99
STFA 17 AD	05h 37m 38.7s	–05° 23' 24"	5.03 / 5.06	134.4 / 315
WNO 52 AC	05h 27m 05.5s	+17° 25' 18"	5.06 / 7.88	707.2 / 252
STF 748 CD	05h 37m 31.7s	–05° 21' 48"	5.06 / 6.38	13.4 / 62
ARN 36 AC	04h 33m 16.5s	+15° 47' 15"	5.48 / 5.70	484.5 / 246
TOK 252 (63 Eri)	05h 02m 00.7s	–10° 11' 53"	5.48 / 8.47	297.9 / 221
STF 855 AB	06h 11m 22.1s	+02° 29' 18"	5.68 / 6.68	29.1 / 115
SHJ 73 (ν_1 CMa)	06h 38m 23.9s	–18° 42' 06"	5.79 / 7.38	17.4 / 265
HJ 3759	05h 27m 59.7s	–19° 39' 31"	5.87 / 7.30	26.6 / 318
ARN 37 AC	06h 00m 47.4s	+01° 50' 16"	5.92 / 6.94	177.8 / 293
SHJ 49 AB	05h 01m 35.9s	+14° 36' 33"	6.06 / 7.43	39.3 / 306
STFA 16 BC	05h 37m 41.7s	–05° 23' 27"	6.19 / 8.46	76.5 / 102
S 476 AB (YZ Lep)	05h 21m 18.2s	–18° 28' 33"	6.31 / 6.48	39.3 / 19

Main variable stars

Name	RA (J2023)	DEC	Magnitude	Max/Per (d)	Type
Betelgeuse (α Ori)	05h 56m 25.1s	+07° 24' 34"	0.0 / 1.3	2335	P - Semi-irr
λ Tau	04h 01m 57.5s	+12° 33' 13"	3.37 / 3.91	3.95	Ecl - Algol
RX Lep	05h 12m 27.4s	–11° 49' 19"	5.0 / 7.4	60	P - Semi-irr
CK Ori	05h 31m 32.9s	+04° 13' 15"	5.9 / 7.1	120	P - Semi-irr
T Mon	06h 26m 27.5s	+07° 04' 17"	5.58 / 6.62	27.02	P - δ Cep
V Mon	06h 23m 53.1s	–02° 12' 31"	6.0 / 13.9	Feb 5 / 341	P - Mira

Navigation map

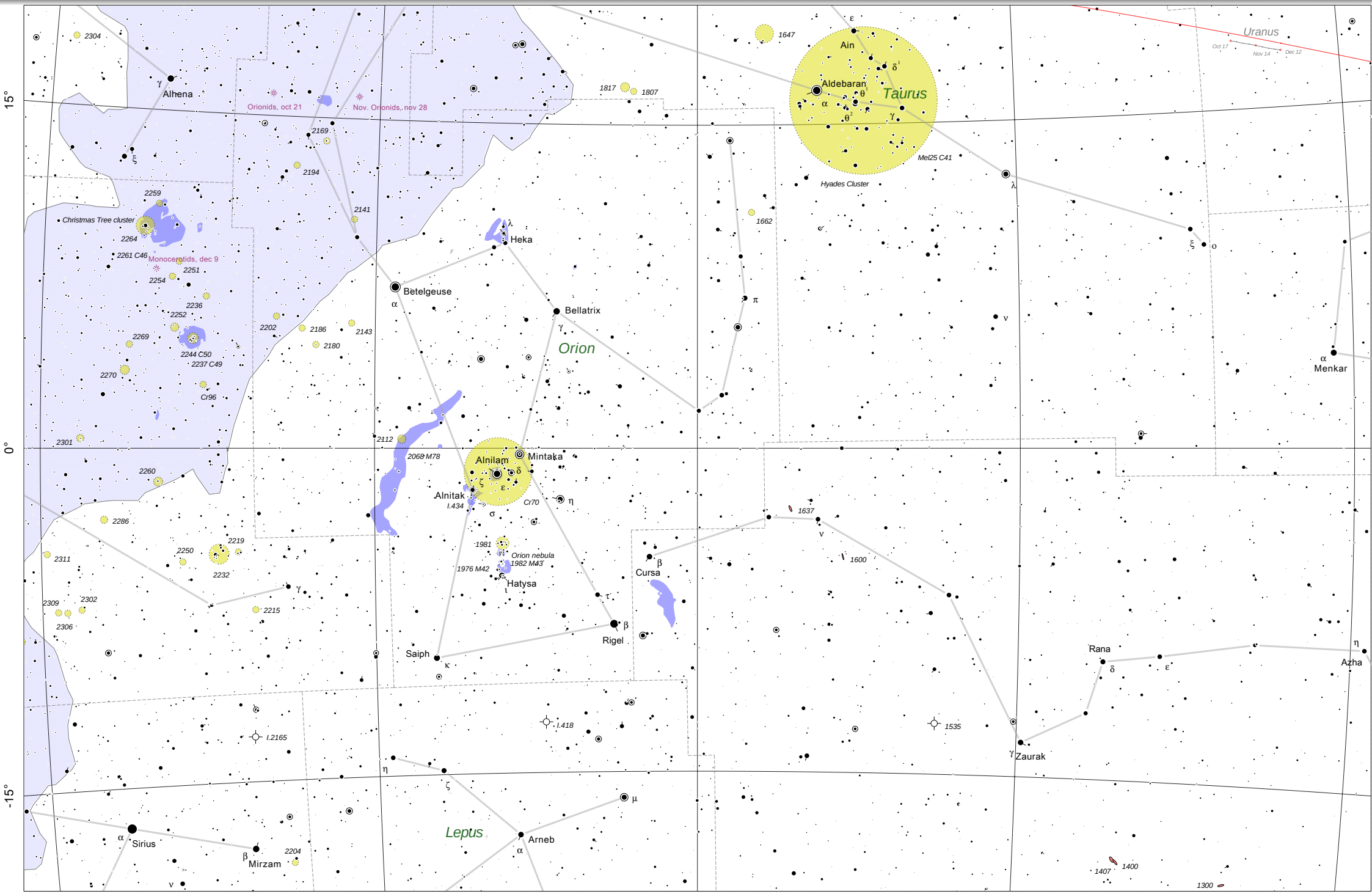


Stellar magnitudes: -1 0 1 2 3 4 5 6 7 8

Types of stars: Double Variable

Symbols for deep sky objects (star cluster, nebula, galaxy) and constellation figure/boundary: Open cluster Globular Nebulose Milky Way Plan.neb. Galaxy Constellation Const. limit Meteors

Chart 11, 30º around 5.0h, 0.0º (Orion, Eridanus, Taurus, Lepus)



Main objects visible on chart 12

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
NGC2261 CALDWELL 46 - Hubble's variable nebula	06h 40m 24.9s	+08° 43' 20"		Nebula	3.0 x 1.0
NGC2237 CALDWELL 49 - Rosette nebula	06h 32m 08.0s	+05° 01' 49"		Nebula	80.0 x 50.0
NGC2632 M44 - Praesepe	08h 41m 43.1s	+19° 35' 14"	3.1	Open cluster	70.0
NGC2264 - Christmas Tree cluster	06h 42m 14.2s	+09° 52' 21"	4.1	Open cluster	40.0
NGC2232	06h 28m 23.2s	−04° 46' 26"	4.2	Open cluster	45.0
NGC2422 M47	07h 37m 38.5s	−14° 31' 57"	4.4	Open cluster	25.0
NGC2244 CALDWELL 50	06h 33m 08.4s	+04° 55' 25"	4.8	Open cluster	24.0
NGC2548 M48	08h 14m 51.2s	−05° 49' 17"	5.8	Open cluster	30.0
NGC2169	06h 09m 42.7s	+13° 57' 35"	5.9	Open cluster	6.0
NGC2323 M50	07h 03m 54.2s	−08° 24' 39"	5.9	Open cluster	15.0
NGC2301	06h 52m 56.2s	+00° 25' 49"	6.0	Open cluster	15.0
NGC2437 M46	07h 42m 50.2s	−14° 51' 55"	6.1	Open cluster	20.0
NGC2539	08h 11m 41.7s	−12° 53' 24"	6.5	Open cluster	15.0
NGC2343	07h 09m 11.9s	−10° 39' 16"	6.7	Open cluster	6.0
NGC2423	07h 38m 10.5s	−13° 55' 28"	6.7	Open cluster	12.0
NGC2682 M67	08h 52m 33.4s	+11° 43' 46"	6.9	Open cluster	25.0
NGC2353	07h 15m 35.7s	−10° 18' 25"	7.1	Open cluster	18.0
NGC2335	07h 07m 54.9s	−10° 03' 57"	7.2	Open cluster	7.0
NGC2360 CALDWELL 58	07h 18m 45.7s	−15° 41' 03"	7.2	Open cluster	14.0
NGC2251	06h 35m 53.6s	+08° 20' 48"	7.3	Open cluster	10.0
NGC2409	07h 32m 38.7s	−17° 14' 23"	7.3	Open cluster	2.5
NGC2396	07h 29m 04.8s	−11° 45' 54"	7.4	Open cluster	10.0
NGC2286	06h 48m 49.2s	−03° 10' 28"	7.5	Open cluster	15.0
NGC2506 CALDWELL 54	08h 01m 07.4s	−10° 50' 02"	7.6	Open cluster	12.0
NGC2252	06h 36m 24.6s	+05° 24' 02"	7.7	Open cluster	18.0
NGC2345	07h 09m 22.5s	−13° 13' 53"	7.7	Open cluster	12.0
NGC2414	07h 34m 15.7s	−15° 30' 17"	7.9	Open cluster	6.0
NGC2374	07h 24m 60.0s	−13° 18' 34"	8.0	Open cluster	12.0
NGC2395	07h 28m 30.4s	+13° 33' 38"	8.0	Open cluster	15.0
NGC2215	06h 21m 56.0s	−07° 17' 45"	8.4	Open cluster	8.0
NGC2324	07h 05m 19.2s	+01° 00' 33"	8.4	Open cluster	8.0
NGC2194	06h 15m 03.6s	+12° 47' 55"	8.5	Open cluster	9.0
NGC2236	06h 30m 54.0s	+06° 48' 50"	8.5	Open cluster	8.0
NGC2180	06h 10m 49.5s	+04° 42' 23"	8.5	Open cluster	6.0
NGC2204	06h 16m 33.4s	−18° 40' 26"	8.6	Open cluster	10.0
NGC2186	06h 13m 20.8s	+05° 27' 05"	8.7	Open cluster	5.0
NGC2250	06h 34m 57.8s	−05° 06' 13"	8.9	Open cluster	10.0
NGC2302	06h 53m 03.6s	−07° 06' 49"	8.9	Open cluster	2.5
Mel71	07h 38m 22.7s	−12° 09' 11"	8.9	Open cluster	8.0
NGC2219	06h 24m 52.5s	−04° 41' 25"	9.0	Open cluster	10.0
NGC2260	06h 39m 12.9s	−01° 29' 37"	9.0	Open cluster	20.0
NGC2270	06h 45m 10.3s	+03° 27' 16"	9.0	Open cluster	20.0
NGC2254	06h 37m 01.4s	+07° 39' 02"	9.1	Open cluster	6.0
Cr96	06h 31m 12.2s	+02° 50' 59"	9.1	Open cluster	8.0
NGC2509	08h 01m 49.4s	−19° 06' 55"	9.3	Open cluster	12.0
NGC2141	06h 04m 11.4s	+10° 26' 40"	9.4	Open cluster	10.0
NGC2440	07h 42m 57.0s	−18° 15' 48"	9.4	Planetary nebula	1.3
NGC2311	06h 58m 55.8s	−04° 38' 37"	9.6	Open cluster	7.0
NGC2479	07h 56m 08.1s	−17° 46' 11"	9.6	Open cluster	11.0
NGC2355	07h 18m 17.0s	+13° 42' 27"	9.7	Open cluster	8.0
NGC2269	06h 44m 30.2s	+04° 36' 00"	10.0	Open cluster	3.0
NGC2304	06h 56m 32.2s	+17° 57' 28"	10.0	Open cluster	3.0
Mel72	07h 39m 29.4s	−10° 44' 13"	10.0	Open cluster	10.0
NGC2202	06h 18m 04.6s	+05° 59' 13"	10.0	Open cluster	7.0
NGC2306	06h 55m 36.4s	−07° 13' 45"	10.0	Open cluster	
NGC2775 CALDWELL 48	09h 11m 33.4s	+06° 56' 33"	10.1	Galaxy	4.3 x 3.3
NGC2432	07h 41m 54.1s	−19° 07' 53"	10.2	Open cluster	7.0
NGC2309	06h 57m 10.6s	−07° 12' 21"	10.5	Open cluster	5.0
IC2165	06h 22m 46.4s	−12° 59' 57"	10.5	Planetary nebula	28.2"
NGC2259	06h 39m 49.8s	+10° 51' 39"	10.8	Open cluster	3.5
NGC2438	07h 42m 54.0s	−14° 47' 24"	10.8	Planetary nebula	1.3
NGC2974	09h 43m 42.8s	−03° 48' 18"	10.9	Galaxy	3.4 x 2.1
NGC2143	06h 04m 21.2s	+05° 43' 34"	11.0	Open cluster	11.0

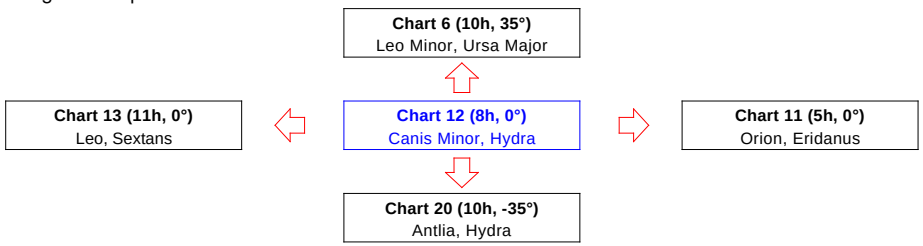
Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
AGC 1 AB (Sirio)	06h 47m 12.3s	−16° 46' 03"	-1.47 / 8.44	11.2 / 68
STF 900 AB (ϵ Mon)	06h 26m 12.3s	+04° 33' 54"	4.42 / 6.64	12.2 / 30
HJ 1167 (τ_1 Hya)	09h 31m 28.6s	−02° 58' 20"	4.64 / 7.28	67.5 / 4
S 579 AB (F Hya)	08h 45m 55.5s	−07° 24' 08"	4.72 / 8.20	78.8 / 310
SHJ 105 AB (27 Hya)	09h 22m 43.8s	−09° 45' 10"	4.91 / 7.03	229.1 / 211
SHY 204 (o_1 Cnc)	08h 59m 48.4s	+15° 08' 34"	5.24 / 5.70	975.6 / 17
STF 855 AB	06h 11m 22.1s	+02° 29' 18"	5.68 / 6.68	29.1 / 115
SHJ 73 (ν_1 CMa)	06h 38m 23.9s	−18° 42' 06"	5.79 / 7.38	17.4 / 265
S 585	08h 57m 18.8s	−18° 25' 09"	5.90 / 7.24	64.2 / 151
ARN 37 AC	06h 00m 47.4s	+01° 50' 16"	5.92 / 6.94	177.8 / 293
STF 1138 AB (2 Pup)	07h 47m 36.0s	−14° 48' 19"	6.00 / 6.73	16.7 / 341
STF 1183 AB	08h 08m 39.9s	−09° 22' 47"	6.22 / 7.77	30.6 / 328
S 574 (ϵ Cnc)	08h 43m 05.0s	+19° 22' 43"	6.28 / 7.48	134.0 / 250
STF 924 AB (20 Gem)	06h 34m 59.9s	+17° 44' 48"	6.31 / 6.88	19.9 / 212
ENG 37 AB (39 Cnc)	08h 42m 44.4s	+19° 50' 31"	6.47 / 6.58	151.8 / 150
STF 1254 AC	08h 43m 00.1s	+19° 30' 14"	6.52 / 7.61	62.5 / 343
STTA 82	07h 06m 42.9s	+01° 24' 59"	6.54 / 7.62	90.3 / 319
KNT 4 AB	07h 49m 50.7s	−16° 07' 53"	6.60 / 6.54	128.1 / 313
BU 584 DC	08h 42m 29.0s	+19° 22' 31"	6.67 / 7.47	99.5 / 89
HJ 99 AB (V401 Hya)	08h 40m 05.7s	−06° 58' 14"	6.82 / 8.27	60.5 / 175
S 550	07h 29m 36.4s	−18° 35' 19"	6.89 / 7.63	39.6 / 116
S 605 (9 Sex)	09h 56m 31.1s	+04° 43' 35"	6.89 / 8.40	53.5 / 287
S 529 AC	06h 40m 08.5s	+12° 08' 14"	6.91 / 8.09	143.5 / 165
STF 1121 AG	07h 38m 42.9s	−14° 35' 25"	6.92 / 7.66	84.0 / 3
STF 1121 AI	07h 38m 42.9s	−14° 35' 25"	6.92 / 6.67	164.7 / 28

Main variable stars

Name	RA (J2023)	DEC	Magnitude	Max/Per (d)	Type
R CMa	07h 20m 30.7s	−16° 26' 24"	5.70 / 6.34	1.14	Ecl - Algol
X Cnc	08h 56m 40.4s	+17° 08' 32"	5.6 / 7.5	195	P - Semi-irr
T Mon	06h 26m 27.5s	+07° 04' 17"	5.58 / 6.62	27.02	P - δ Cep
W CMa	07h 09m 07.9s	−11° 57' 40"	6.35 / 7.9		P - Irr Superg
U Mon	07h 31m 53.3s	−09° 49' 36"	6.1 / 8.8	91.32	P - β Cep (β CMa)
V Mon	06h 23m 53.1s	−02° 12' 31"	6.0 / 13.9	Feb 5 / 341	P - Mira
R Cnc	08h 17m 49.8s	+11° 39' 14"	6.07 / 11.8	Jul 4 / 362	P - Mira
RT Cnc	08h 59m 30.9s	+10° 45' 18"	7.12 / 8.6	60	P - Semi-irr
T Hya	08h 56m 47.0s	−09° 13' 50"	6.7 / 13.48	Jun 21 / 299	P - Mira
RT Hya	08h 30m 49.2s	−06° 23' 50"	7.0 / 10.2	290	P - Semi-irr
RY Mon	07h 08m 03.3s	−07° 35' 40"	7.5 / 9.2	455.7	P - Semi-irr

Navigation map

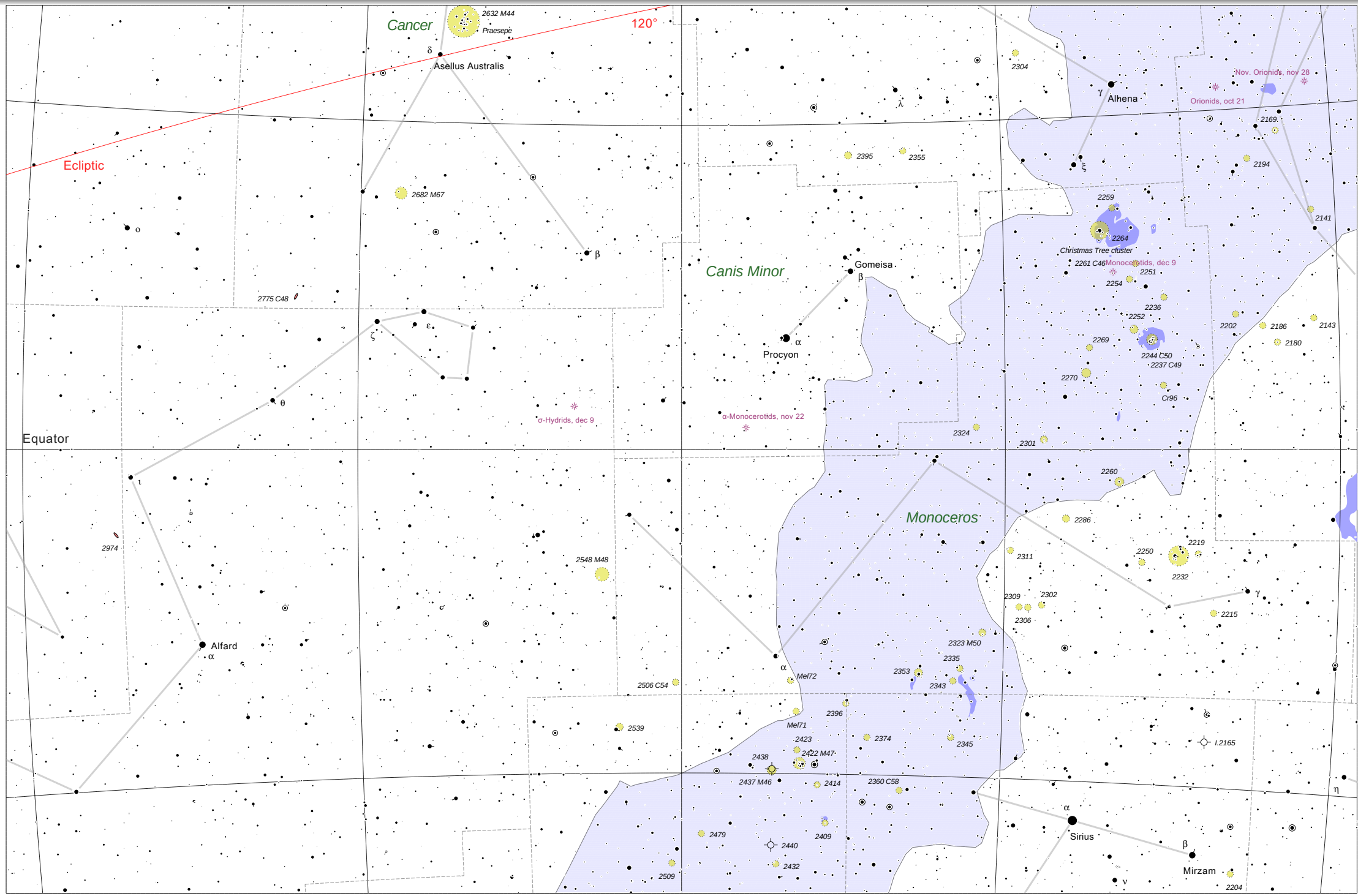


Stellar magnitudes: -1 0 1 2 3 4 5 6 7 8

Types of stars: Double Variable

Symbols for deep sky objects (star cluster, nebula, galaxy) and constellation figure/boundary: Open cluster Globular Nebulose Milky Way Plan.neb. Galaxy Constellation Const. limit Meteors

Chart 12, 30º around 8.0h, 0.0º (Canis Minor, Hydra, Monoceros, Cancer)



Main objects visible on chart 13

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
NGC3242 CALDWELL 59 - Ghost of Jupiter	10h 25m 52.6s	–18° 45' 33"	7.7	Planetary nebula	1.1
NGC4594 M104 - Sombrero galaxy	12h 41m 11.1s	–11° 44' 55"	8.0	Galaxy	8.6 x 4.2
NGC4472 M49	12h 30m 56.9s	+07° 52' 23"	8.4	Galaxy	10.2 x 8.3
NGC4486 M87 - Virgo A	12h 31m 59.2s	+12° 15' 49"	8.6	Galaxy	8.3 x 6.6
NGC4649 M60	12h 44m 49.3s	+11° 25' 39"	8.8	Galaxy	7.6 x 6.2
NGC3115 CALDWELL 53 - Spindle galaxy	10h 06m 22.8s	–07° 49' 50"	8.9	Galaxy	7.2 x 2.4
NGC3627 M66	11h 21m 27.0s	+12° 51' 50"	8.9	Galaxy	9.1 x 4.1
NGC4406 M86	12h 27m 21.4s	+12° 49' 09"	8.9	Galaxy	8.9 x 5.8
NGC3521	11h 06m 59.5s	–00° 09' 41"	9.0	Galaxy	11.2 x 5.4
NGC4374 M84 - Markarian chain	12h 26m 13.5s	+12° 45' 35"	9.1	Galaxy	6.5 x 5.6
NGC4382 M85	12h 26m 33.5s	+18° 03' 49"	9.1	Galaxy	7.1 x 5.5
NGC4697 CALDWELL 52	12h 49m 47.2s	–05° 55' 30"	9.2	Galaxy	7.2 x 4.7
NGC3368 M96	10h 47m 58.5s	+11° 41' 54"	9.3	Galaxy	7.8 x 5.2
NGC3379 M105	10h 49m 02.3s	+12° 27' 33"	9.3	Galaxy	5.3 x 4.8
NGC3623 M65 - Leo's Triplet	11h 20m 07.6s	+12° 57' 53"	9.3	Galaxy	9.8 x 2.9
NGC4526	12h 35m 12.9s	+07° 34' 20"	9.3	Galaxy	7.0 x 2.5
NGC4321 M100	12h 24m 04.7s	+15° 41' 43"	9.4	Galaxy	7.5 x 6.1
NGC3628 - Hamburger galaxy	11h 21m 28.7s	+13° 27' 50"	9.5	Galaxy	13.1 x 3.1
NGC4569 M90	12h 37m 59.6s	+13° 02' 15"	9.5	Galaxy	9.5 x 4.4
NGC4636	12h 44m 00.2s	+02° 33' 41"	9.5	Galaxy	5.9 x 4.6
NGC4699	12h 50m 13.9s	–08° 47' 20"	9.5	Galaxy	3.8 x 2.8
NGC4365	12h 25m 38.5s	+07° 11' 25"	9.6	Galaxy	6.9 x 5.0
NGC4501 M88	12h 33m 08.6s	+14° 17' 35"	9.6	Galaxy	6.8 x 3.7
NGC4621 M59	12h 43m 11.8s	+11° 31' 17"	9.6	Galaxy	5.4 x 3.7
NGC3351 M95	10h 45m 10.6s	+11° 34' 56"	9.7	Galaxy	7.4 x 5.0
NGC4303 M61	12h 23m 05.4s	+04° 20' 43"	9.7	Galaxy	6.5 x 5.9
NGC4579 M58	12h 38m 53.4s	+11° 41' 31"	9.7	Galaxy	6.0 x 4.8
NGC4552 M89	12h 36m 49.6s	+12° 25' 47"	9.8	Galaxy	3.5
NGC3384	10h 49m 29.5s	+12° 30' 24"	9.9	Galaxy	5.4 x 2.7
NGC3607	11h 18m 07.1s	+17° 55' 35"	9.9	Galaxy	4.6 x 4.0
NGC4254 M99	12h 19m 59.4s	+14° 17' 24"	9.9	Galaxy	5.3 x 4.6
NGC4216	12h 17m 04.2s	+13° 01' 12"	10.0	Galaxy	8.1 x 1.8
NGC4429	12h 28m 36.3s	+10° 58' 49"	10.0	Galaxy	5.8 x 2.8
NGC4535	12h 35m 30.3s	+08° 04' 15"	10.0	Galaxy	7.1 x 5.0
NGC4753	12h 53m 33.0s	–01° 19' 29"	10.0	Galaxy	6.0 x 2.8
NGC2775 CALDWELL 48	09h 11m 33.4s	+06° 56' 33"	10.1	Galaxy	4.3 x 3.3
NGC4192 M98	12h 14m 58.0s	+14° 46' 18"	10.1	Galaxy	9.8 x 2.8
NGC4450	12h 29m 38.8s	+16° 57' 26"	10.1	Galaxy	5.4 x 4.1
NGC3169	10h 15m 26.2s	+03° 21' 08"	10.2	Galaxy	4.2 x 2.9
NGC4438 - The Eyes	12h 28m 55.5s	+12° 52' 54"	10.2	Galaxy	8.5 x 3.0
NGC4473	12h 30m 58.5s	+13° 18' 10"	10.2	Galaxy	4.5 x 2.5
NGC4548 M91	12h 36m 35.9s	+14° 22' 12"	10.2	Galaxy	5.2 x 4.2
NGC3227	10h 24m 45.6s	+19° 44' 54"	10.3	Galaxy	4.1 x 3.9
NGC3489	11h 01m 31.1s	+13° 46' 37"	10.3	Galaxy	3.6 x 2.2
NGC4038 CALDWELL 60 - Antennae	12h 03m 03.6s	–18° 59' 33"	10.3	Galaxy	3.4 x 1.7
NGC4039 CALDWELL 61	12h 03m 04.6s	–19° 00' 49"	10.3	Galaxy	3.3 x 1.7
NGC4546	12h 36m 40.6s	–03° 55' 10"	10.3	Galaxy	3.3 x 1.6
NGC4762	12h 54m 05.2s	+11° 06' 22"	10.3	Galaxy	8.7 x 1.7
NGC3166	10h 14m 57.0s	+03° 18' 40"	10.4	Galaxy	4.8 x 2.3
NGC3377	10h 48m 55.4s	+13° 51' 50"	10.4	Galaxy	5.0 x 3.0
NGC3640	11h 22m 17.7s	+03° 06' 30"	10.4	Galaxy	4.0 x 3.2
NGC4153	12h 11m 16.4s	+18° 24' 53"	10.4	Globular cluster	4.4
NGC4261	12h 20m 33.6s	+05° 41' 49"	10.4	Galaxy	4.1 x 3.6
NGC4293	12h 22m 22.7s	+18° 15' 19"	10.4	Galaxy	5.6 x 2.6
NGC4442	12h 29m 14.0s	+09° 40' 37"	10.4	Galaxy	4.5 x 1.8
NGC4459	12h 30m 09.7s	+13° 51' 06"	10.4	Galaxy	3.5 x 2.7
NGC4477	12h 31m 11.7s	+13° 30' 36"	10.4	Galaxy	3.7 x 3.3
NGC4517	12h 33m 56.3s	–00° 00' 40"	10.4	Galaxy	10.5 x 1.5
NGC4596	12h 41m 05.8s	+10° 03' 01"	10.4	Galaxy	4.0 x 3.0
NGC3412	10h 52m 06.2s	+13° 17' 25"	10.5	Galaxy	3.7 x 2.2
NGC4527	12h 35m 19.3s	+02° 31' 36"	10.5	Galaxy	6.2 x 2.1
NGC4654	12h 45m 05.9s	+13° 00' 03"	10.5	Galaxy	5.0 x 3.1
NGC4664	12h 46m 16.5s	+02° 55' 47"	10.5	Galaxy	3.5
NGC4856	13h 00m 34.0s	–15° 09' 57"	10.5	Galaxy	4.3 x 1.2
NGC3887	11h 48m 14.8s	–16° 58' 54"	10.6	Galaxy	3.5 x 2.7
NGC4030	12h 01m 34.1s	–01° 13' 43"	10.6	Galaxy	4.2 x 3.2
NGC4536	12h 35m 37.5s	+02° 03' 38"	10.6	Galaxy	7.6 x 3.2
NGC4698	12h 49m 32.8s	+08° 21' 48"	10.6	Galaxy	4.0 x 2.5
NGC4754	12h 53m 26.9s	+11° 11' 21"	10.6	Galaxy	4.4 x 2.4
NGC3962	11h 55m 50.4s	–14° 06' 10"	10.7	Galaxy	2.6 x 2.2
NGC4666	12h 46m 19.0s	–00° 35' 18"	10.7	Galaxy	4.5 x 1.4
NGC3608	11h 18m 11.6s	+18° 01' 20"	10.8	Galaxy	3.2 x 2.6
NGC3810	11h 42m 09.8s	+11° 20' 34"	10.8	Galaxy	4.3 x 3.0
NGC4371	12h 26m 05.4s	+11° 34' 37"	10.8	Galaxy	4.0 x 2.3
NGC4435 - The Eyes	12h 28m 50.4s	+12° 57' 10"	10.8	Galaxy	3.0 x 2.2
NGC4568	12h 37m 43.9s	+11° 06' 44"	10.8	Galaxy	4.6 x 2.2
NGC4643	12h 44m 30.6s	+01° 51' 08"	10.8	Galaxy	3.1 x 2.5
NGC4651	12h 44m 51.5s	+16° 16' 05"	10.8	Galaxy	4.0 x 2.7
NGC2974	09h 43m 42.8s	–03° 48' 18"	10.9	Galaxy	3.4 x 2.1
NGC3593	11h 15m 49.1s	+12° 41' 34"	10.9	Galaxy	5.2 x 1.9
NGC4267	12h 20m 55.4s	+12° 40' 15"	10.9	Galaxy	3.0 x 2.8
NGC4361	12h 25m 42.7s	–18° 54' 41"	10.9	Planetary nebula	2.1

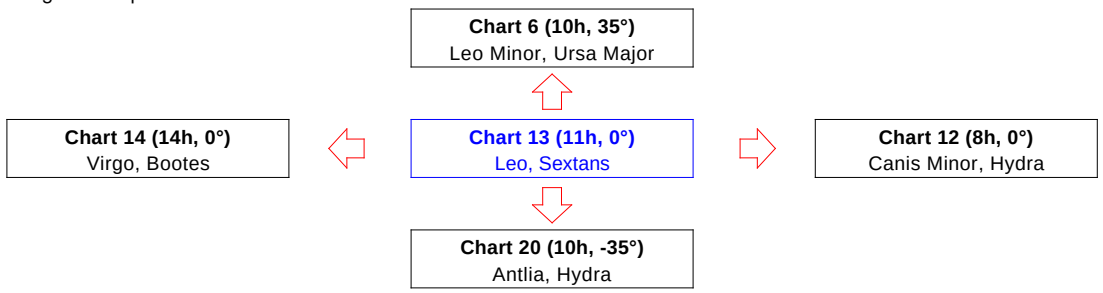
Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
STFB 6 AB (Regolo)	10h 10m 49.4s	+11° 44' 25"	1.40 / 8.24	179.2 / 304
BU 604 AD	11h 51m 26.1s	+14° 18' 58"	2.14 / 8.49	240.3 / 190
SHJ 145 AB (Algorab)	12h 32m 15.9s	–16° 46' 09"	2.95 / 8.47	24.2 / 216
HJ 1167 (τ_1 Hya)	09h 31m 28.6s	–02° 58' 20"	4.64 / 7.28	67.5 / 4
SHJ 105 AB (27 Hya)	09h 22m 43.8s	–09° 45' 10"	4.91 / 7.03	229.1 / 211
STFA 19 AB (τ Leo)	11h 30m 17.8s	+02° 36' 08"	5.05 / 7.47	89.2 / 181
STF 1657 (24 Com)	12h 37m 26.3s	+18° 07' 27"	5.11 / 6.33	20.2 / 272
BU 600 AC	11h 19m 18.0s	–07° 23' 12"	6.15 / 8.22	53.2 / 99
SHJ 110 AC	10h 06m 14.7s	–18° 19' 34"	6.22 / 6.97	21.2 / 274
STF 1466 AC	10h 45m 44.1s	+04° 30' 20"	6.23 / 8.10	333.8 / 210
HJ 2530 AC	10h 26m 35.4s	+02° 08' 01"	6.42 / 6.72	201.6 / 63
STF 1540 AB (83 Leo)	11h 29m 06.9s	+02° 45' 34"	6.55 / 7.50	28.6 / 146
STF 1627	12h 20m 31.8s	–04° 12' 15"	6.55 / 6.90	20.1 / 196
STF 1474 AB	10h 49m 54.3s	–15° 30' 21"	6.66 / 7.00	65.9 / 28
STF 1474 AC	10h 49m 54.3s	–15° 30' 21"	6.66 / 7.59	72.6 / 27
STF 1659 EF	12h 37m 56.6s	–12° 16' 26"	6.78 / 6.64	333.8 / 121
STF 1604 AC	12h 11m 51.1s	–12° 06' 46"	6.86 / 8.12	10.5 / 3
S 605 (9 Sex)	09h 56m 31.1s	+04° 43' 35"	6.89 / 8.40	53.5 / 287

Main variable stars

Name	RA (J2023)	DEC	Magnitude	Max/Per (d)	Type
SS Vir	12h 26m 25.1s	+00° 38' 33"	6.0 / 9.6	Mar 14 / 364	P - Semi-irr
R Vir	12h 39m 40.0s	+06° 51' 45"	6.1 / 12.1	Feb 27, Jul 22, Dec 15 / 146	P - Mira

Navigation map

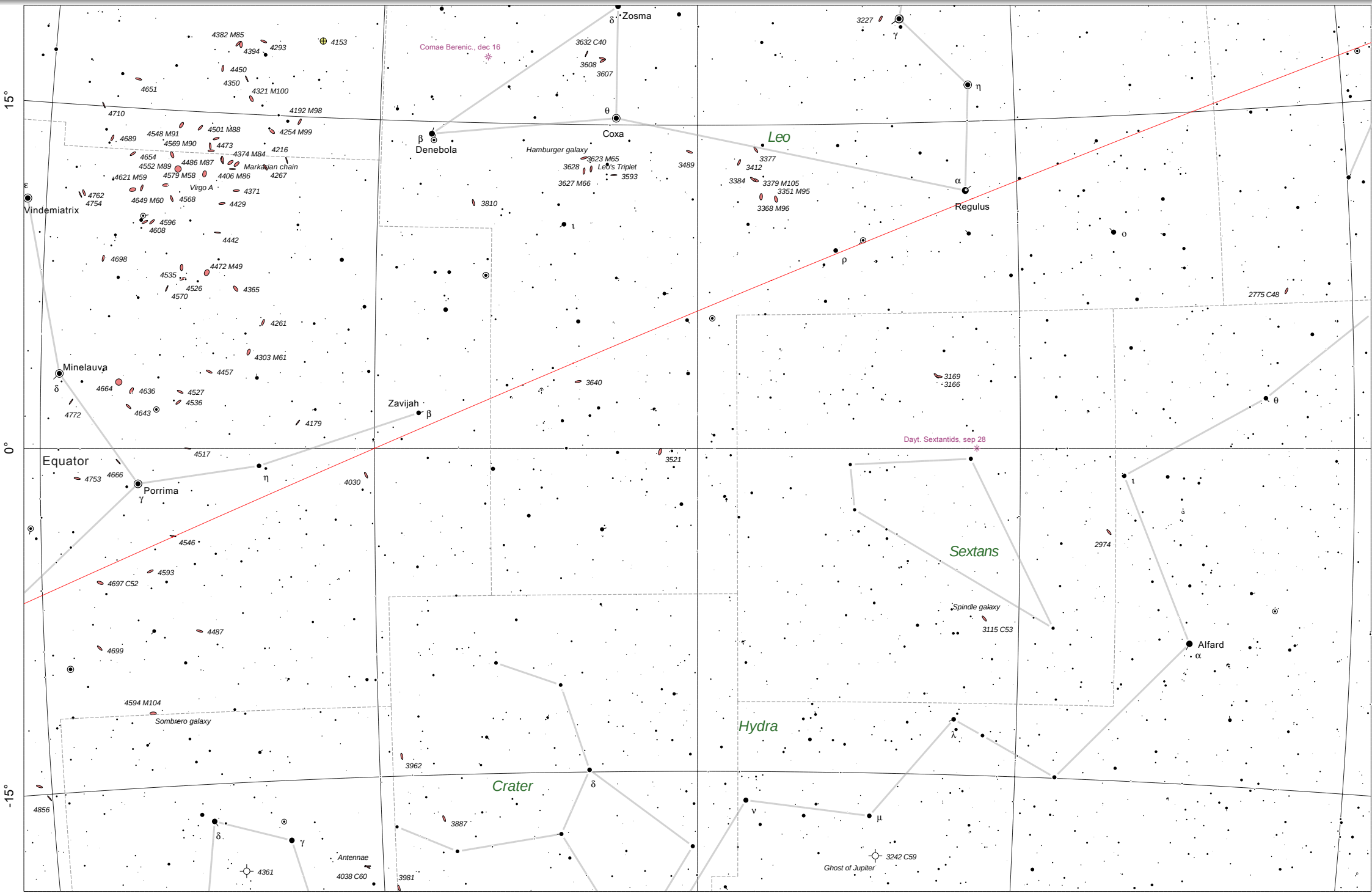


Stellar magnitudes: -1 0 1 2 3 4 5 6 7 8

Types of stars: Double, Variable

Symbols for deep sky objects (star cluster, nebula, galaxy) and constellation figure/boundary: Open cluster, Globular, Nebulose, Milky Way, Plan.neb., Galaxy, Constellation, Const. limit, Meteors

Chart 13, 30º around 11.0h, 0.0º (Leo, Sextans, Virgo, Crater)



Main objects visible on chart 14

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
NGC5904 M5	15h 19m 43.7s	+02° 00' 02"	5.7	Globular cluster	23.0
NGC5024 M53	13h 14m 02.9s	+18° 02' 54"	7.7	Globular cluster	13.0
NGC4594 M104 - Sombrero galaxy	12h 41m 11.1s	−11° 44' 55"	8.0	Galaxy	8.6 x 4.2
NGC4472 M49	12h 30m 56.9s	+07° 52' 23"	8.4	Galaxy	10.2 x 8.3
NGC4486 M87 - Virgo A	12h 31m 59.2s	+12° 15' 49"	8.6	Galaxy	8.3 x 6.6
NGC4649 M60	12h 44m 49.3s	+11° 25' 39"	8.8	Galaxy	7.6 x 6.2
NGC4406 M86	12h 27m 21.4s	+12° 49' 09"	8.9	Galaxy	8.9 x 5.8
NGC5053	13h 17m 34.5s	+17° 34' 40"	9.0	Globular cluster	10.0
NGC4374 M84 - Markarian chain	12h 26m 13.5s	+12° 45' 35"	9.1	Galaxy	6.5 x 5.6
NGC4382 M85	12h 26m 33.5s	+18° 03' 49"	9.1	Galaxy	7.1 x 5.5
NGC4697 CALDWELL 52	12h 49m 47.2s	−05° 55' 30"	9.2	Galaxy	7.2 x 4.7
NGC4526	12h 35m 12.9s	+07° 34' 20"	9.3	Galaxy	7.0 x 2.5
NGC4321 M100	12h 24m 04.7s	+15° 41' 43"	9.4	Galaxy	7.5 x 6.1
NGC4569 M90	12h 37m 59.6s	+13° 02' 15"	9.5	Galaxy	9.5 x 4.4
NGC4636	12h 44m 00.2s	+02° 33' 41"	9.5	Galaxy	5.9 x 4.6
NGC4699	12h 50m 13.9s	−08° 47' 20"	9.5	Galaxy	3.8 x 2.8
NGC5634	14h 30m 50.0s	−06° 04' 38"	9.5	Globular cluster	5.5
NGC4365	12h 25m 38.5s	+07° 11' 25"	9.6	Galaxy	6.9 x 5.0
NGC4501 M88	12h 33m 08.6s	+14° 17' 35"	9.6	Galaxy	6.8 x 3.7
NGC4621 M59	12h 43m 11.8s	+11° 31' 17"	9.6	Galaxy	5.4 x 3.7
NGC4303 M61	12h 23m 05.4s	+04° 20' 43"	9.7	Galaxy	6.5 x 5.9
NGC4579 M58	12h 38m 53.4s	+11° 41' 31"	9.7	Galaxy	6.0 x 4.8
NGC4552 M89	12h 36m 49.6s	+12° 25' 47"	9.8	Galaxy	3.5
NGC4254 M99	12h 19m 59.4s	+14° 17' 24"	9.9	Galaxy	5.3 x 4.6
NGC4216	12h 17m 04.2s	+13° 01' 12"	10.0	Galaxy	8.1 x 1.8
NGC4429	12h 28m 36.3s	+10° 58' 49"	10.0	Galaxy	5.8 x 2.8
NGC4535	12h 35m 30.3s	+08° 04' 15"	10.0	Galaxy	7.1 x 5.0
NGC4753	12h 53m 33.0s	−01° 19' 29"	10.0	Galaxy	6.0 x 2.8
NGC5247	13h 39m 17.8s	−18° 00' 04"	10.0	Galaxy	5.4 x 4.9
NGC5846	15h 07m 39.1s	+01° 31' 03"	10.0	Galaxy	4.0 x 3.7
NGC4192 M98	12h 14m 58.0s	+14° 46' 18"	10.1	Galaxy	9.8 x 2.8
NGC4450	12h 29m 38.8s	+16° 57' 26"	10.1	Galaxy	5.4 x 4.1
NGC5363	13h 57m 16.5s	+05° 08' 32"	10.1	Galaxy	4.1 x 2.6
NGC4438 - The Eyes	12h 28m 55.5s	+12° 52' 54"	10.2	Galaxy	8.5 x 3.0
NGC4473	12h 30m 58.5s	+13° 18' 10"	10.2	Galaxy	4.5 x 2.5
NGC4548 M91	12h 36m 35.9s	+14° 22' 12"	10.2	Galaxy	5.2 x 4.2
NGC4038 CALDWELL 60 - Antennae	12h 03m 03.6s	−18° 59' 33"	10.3	Galaxy	3.4 x 1.7
NGC4039 CALDWELL 61	12h 03m 04.6s	−19° 00' 49"	10.3	Galaxy	3.3 x 1.7
NGC4546	12h 36m 40.6s	−03° 55' 10"	10.3	Galaxy	3.3 x 1.6
NGC4762	12h 54m 05.2s	+11° 06' 22"	10.3	Galaxy	8.7 x 1.7
NGC5248 CALDWELL 45	13h 38m 40.7s	+08° 46' 11"	10.3	Galaxy	6.2 x 4.5
NGC5746	14h 46m 05.8s	+01° 51' 36"	10.3	Galaxy	7.4 x 1.3
NGC4153	12h 11m 16.4s	+18° 24' 53"	10.4	Globular cluster	4.4
NGC4261	12h 20m 33.6s	+05° 41' 49"	10.4	Galaxy	4.1 x 3.6
NGC4293	12h 22m 22.7s	+18° 15' 19"	10.4	Galaxy	5.6 x 2.6
NGC4442	12h 29m 14.0s	+09° 40' 37"	10.4	Galaxy	4.5 x 1.8
NGC4459	12h 30m 09.7s	+13° 51' 06"	10.4	Galaxy	3.5 x 2.7
NGC4477	12h 31m 11.7s	+13° 30' 36"	10.4	Galaxy	3.7 x 3.3
NGC4517	12h 33m 56.3s	−00° 00' 40"	10.4	Galaxy	10.5 x 1.5
NGC4596	12h 41m 05.8s	+10° 03' 01"	10.4	Galaxy	4.0 x 3.0
NGC4527	12h 35m 19.3s	+02° 31' 36"	10.5	Galaxy	6.2 x 2.1
NGC4654	12h 45m 05.9s	+13° 00' 03"	10.5	Galaxy	5.0 x 3.1
NGC4664	12h 46m 16.5s	+02° 55' 47"	10.5	Galaxy	3.5
NGC4856	13h 00m 34.0s	−15° 09' 57"	10.5	Galaxy	4.3 x 1.2
NGC5364	13h 57m 21.3s	+04° 54' 14"	10.5	Galaxy	6.8 x 4.4
NGC5813	15h 02m 21.2s	+01° 36' 44"	10.5	Galaxy	4.0 x 2.8
NGC4030	12h 01m 34.1s	−01° 13' 43"	10.6	Galaxy	4.2 x 3.2
NGC4536	12h 35m 37.5s	+02° 03' 38"	10.6	Galaxy	7.6 x 3.2
NGC4698	12h 49m 32.8s	+08° 21' 48"	10.6	Galaxy	4.0 x 2.5
NGC4754	12h 53m 26.9s	+11° 11' 21"	10.6	Galaxy	4.4 x 2.4
NGC5566	14h 21m 29.5s	+03° 49' 42"	10.6	Galaxy	6.6 x 2.3
NGC3962	11h 55m 50.4s	−14° 06' 10"	10.7	Galaxy	2.6 x 2.2
NGC4666	12h 46m 19.0s	−00° 35' 18"	10.7	Galaxy	4.5 x 1.4
NGC4958	13h 07m 00.9s	−08° 08' 34"	10.7	Galaxy	3.9 x 1.4
NGC4371	12h 26m 05.4s	+11° 34' 37"	10.8	Galaxy	4.0 x 2.3
NGC4435 - The Eyes	12h 28m 50.4s	+12° 57' 10"	10.8	Galaxy	3.0 x 2.2
NGC4568	12h 37m 43.9s	+11° 06' 44"	10.8	Galaxy	4.6 x 2.2
NGC4643	12h 44m 30.6s	+01° 51' 08"	10.8	Galaxy	3.1 x 2.5
NGC4651	12h 44m 51.5s	+16° 16' 05"	10.8	Galaxy	4.0 x 2.7
NGC5018	13h 14m 15.1s	−19° 38' 27"	10.8	Galaxy	3.4 x 2.6
NGC5044	13h 16m 37.6s	−16° 30' 20"	10.8	Galaxy	3.0
NGC5850	15h 08m 17.6s	+01° 27' 24"	10.8	Galaxy	4.5 x 3.9
NGC5921	15h 23m 04.9s	+04° 59' 21"	10.8	Galaxy	4.8 x 4.0
NGC4267	12h 20m 55.4s	+12° 40' 15"	10.9	Galaxy	3.0 x 2.8
NGC4361	12h 25m 42.7s	−18° 54' 41"	10.9	Planetary nebula	2.1
NGC4394	12h 27m 05.2s	+18° 05' 13"	10.9	Galaxy	3.4 x 3.2
NGC4457	12h 30m 09.4s	+03° 26' 39"	10.9	Galaxy	2.6 x 2.3
NGC4570	12h 38m 03.3s	+07° 07' 14"	10.9	Galaxy	3.7 x 1.2
NGC4593	12h 40m 50.5s	−05° 28' 12"	10.9	Galaxy	3.9 x 2.9
NGC4902	13h 02m 12.4s	−14° 38' 14"	10.9	Galaxy	2.9 x 2.6
NGC5054	13h 18m 12.1s	−16° 45' 20"	10.9	Galaxy	5.1 x 2.8
NGC5701	14h 40m 20.0s	+05° 15' 56"	10.9	Galaxy	4.3 x 4.1
NGC5838	15h 06m 35.9s	+02° 00' 39"	10.9	Galaxy	4.2 x 1.5

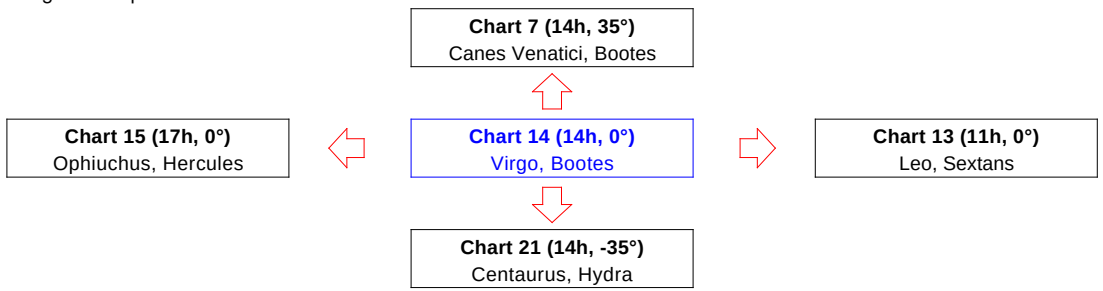
Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
SHJ 186 AB (α_2 Lib)	14h 53m 26.6s	−16° 13' 44"	2.74 / 5.19	231.1 / 314
SHJ 145 AB (Algorab)	12h 32m 15.9s	−16° 46' 09"	2.95 / 8.47	24.2 / 216
STF 1657 (24 Com)	12h 37m 26.3s	+18° 07' 27"	5.11 / 6.33	20.2 / 272
HJL 1086 AB	14h 26m 28.8s	+05° 36' 49"	5.11 / 7.32	158.9 / 274
HJL 1087 (22 Boo)	14h 28m 35.7s	+19° 01' 20"	5.43 / 8.38	224.4 / 254
STF 1772 AD	13h 42m 51.9s	+19° 43' 28"	5.76 / 7.38	208.4 / 1
STF 1962 (178 Lib)	15h 41m 09.3s	−08° 56' 18"	6.44 / 6.49	11.7 / 189
BGH 46 AB	13h 18m 46.2s	+19° 32' 38"	6.46 / 7.59	202.9 / 58
STFA 23 AB (32 Com)	12h 54m 29.1s	+16° 49' 29"	6.50 / 6.99	196.3 / 51
STF 1627	12h 20m 31.8s	−04° 12' 15"	6.55 / 6.90	20.1 / 196
SHJ 179 AB	14h 28m 04.9s	−20° 10' 31"	6.61 / 7.16	35.0 / 296
STF 1919	15h 14m 48.4s	+19° 06' 58"	6.71 / 7.38	23.4 / 11
STF 1659 EF	12h 37m 56.6s	−12° 16' 26"	6.78 / 6.64	333.8 / 121
SHJ 195	15h 17m 05.0s	−18° 35' 48"	6.79 / 8.32	47.5 / 141
STF 1604 AC	12h 11m 51.1s	−12° 06' 46"	6.86 / 8.12	10.5 / 3
SHJ 202 AB	15h 30m 39.5s	−09° 30' 16"	6.95 / 7.61	52.0 / 132

Main variable stars

Name	RA (J2023)	DEC	Magnitude	Max/Per (d)	Type
δ Lib	15h 02m 12.3s	−08° 36' 32"	4.91 / 5.90	2.33	Ecl - Algol
SS Vir	12h 26m 25.1s	+00° 38' 33"	6.0 / 9.6	Mar 14 / 364	P - Semi-irr
R Vir	12h 39m 40.0s	+06° 51' 45"	6.1 / 12.1	Feb 27, Jul 22, Dec 15 / 146	P - Mira

Navigation map

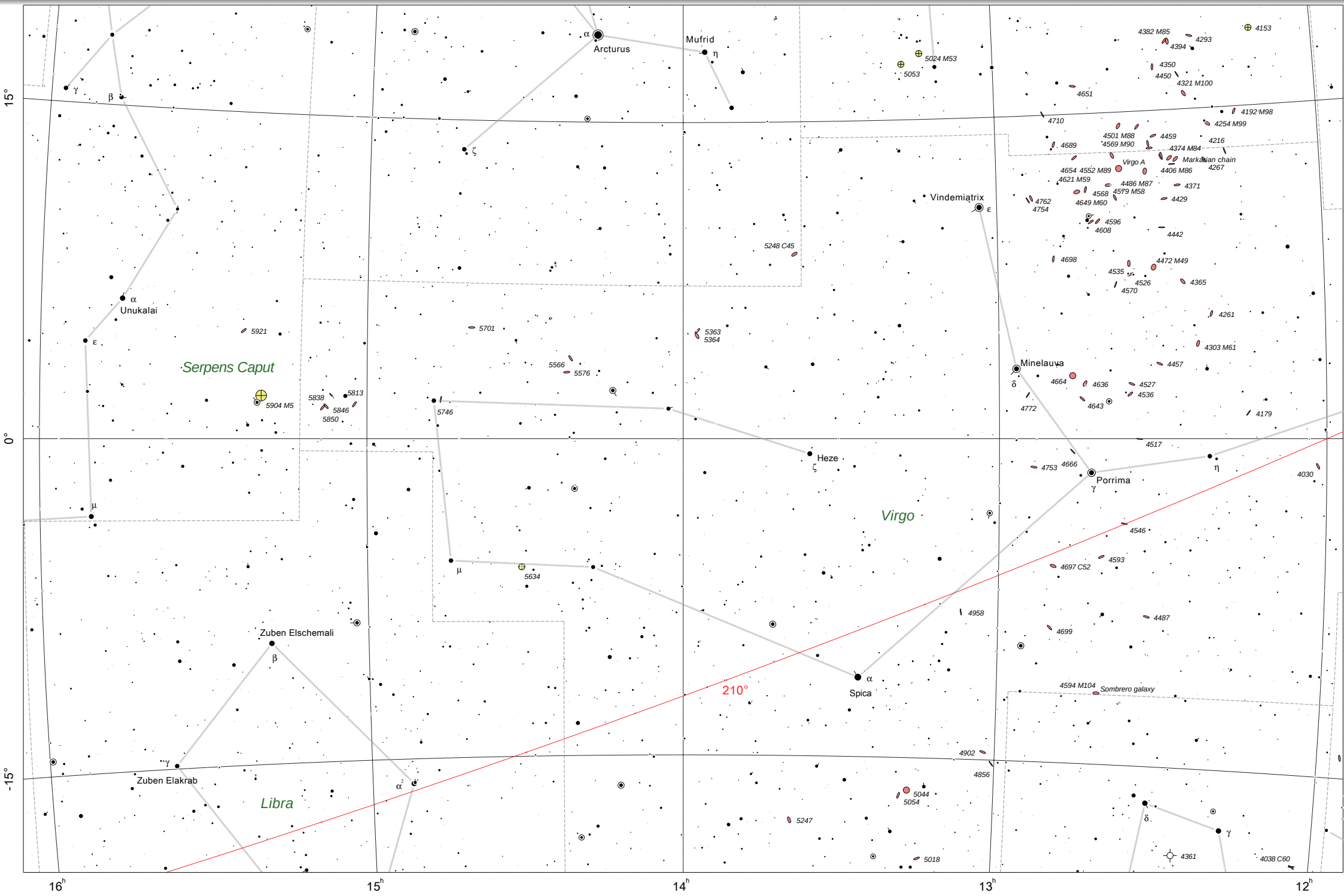


Stellar magnitudes: -1 0 1 2 3 4 5 6 7 8

Types of stars: Double, Variable

Symbols for deep sky objects (star cluster, nebula, galaxy) and constellation figure/boundary: Open cluster, Globular, Nebulose, Milky Way, Plan.neb., Galaxy, Constellation, Const. limit, Meteors

Chart 14, 30º around 14.0h, 0.0º (Virgo, Bootes, Libra, Serpens Caput)



Main objects visible on chart 15

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
Mel186	18h 01m 45.1s	+02° 56' 02"	3.0	Open cluster	4.0°
IC4665	17h 47m 19.7s	+05° 42' 33"	4.2	Open cluster	70.0
NGC6633	18h 28m 22.3s	+06° 31' 26"	4.6	Open cluster	20.0
IC4725 M25	18h 33m 06.3s	–19° 06' 07"	4.6	Open cluster	26.0
IC4756	18h 40m 01.8s	+05° 27' 19"	4.6	Open cluster	40.0
IC4715 M24 - Sagittarius Star Cloud	18h 20m 09.0s	–18° 32' 21"	5.0	Open cluster	1.50°
NGC6494 M23	17h 58m 17.3s	–19° 00' 47"	5.5	Open cluster	25.0
NGC5904 M5	15h 19m 43.7s	+02° 00' 02"	5.7	Globular cluster	23.0
NGC6705 M11 - Wild Duck cluster	18h 52m 19.0s	–06° 14' 29"	5.8	Open cluster	11.0
NGC6618 M17 - Omega nebula	18h 22m 06.6s	–16° 09' 35"	6.0	Nebula	20.0 x 15.0
NGC6605	18h 17m 42.9s	–14° 59' 26"	6.0	Open cluster	29.0
NGC6611 M16	18h 20m 03.2s	–13° 47' 15"	6.0	Open cluster	8.0
NGC6218 M12	16h 48m 26.2s	–01° 59' 13"	6.1	Globular cluster	16.0
Cr350	17h 49m 10.0s	+01° 17' 37"	6.1	Open cluster	45.0
NGC6604	18h 19m 23.4s	–12° 12' 22"	6.5	Open cluster	6.0
NGC6254 M10	16h 58m 21.8s	–04° 07' 60"	6.6	Globular cluster	20.0
NGC6709	18h 52m 35.3s	+10° 21' 44"	6.7	Open cluster	15.0
NGC6613 M18	18h 21m 18.1s	–17° 05' 25"	6.9	Open cluster	7.0
NGC6402 M14	17h 38m 48.6s	–03° 15' 27"	7.6	Globular cluster	11.0
NGC6171 M107	16h 33m 49.3s	–13° 06' 01"	7.8	Globular cluster	13.0
NGC6333 M9	17h 20m 32.7s	–18° 32' 17"	7.8	Globular cluster	12.0
NGC6664	18h 37m 45.7s	–08° 10' 01"	7.8	Open cluster	12.0
NGC6694 M26	18h 46m 30.7s	–09° 21' 34"	8.0	Open cluster	8.0
NGC6572	18h 13m 13.4s	+06° 51' 40"	8.1	Planetary nebula	15.0"
NGC6712	18h 54m 19.6s	–08° 40' 33"	8.1	Globular cluster	9.8
NGC6356	17h 24m 55.5s	–17° 49' 57"	8.2	Globular cluster	10.0
NGC6645	18h 33m 57.7s	–16° 51' 55"	8.5	Open cluster	15.0
Tr33	18h 26m 03.7s	–19° 42' 09"	8.5	Open cluster	5.5
NGC6539	18h 06m 04.6s	–07° 34' 56"	8.9	Globular cluster	7.9
NGC6649	18h 34m 44.6s	–10° 22' 60"	8.9	Open cluster	6.0
NGC6625	18h 24m 30.0s	–11° 59' 59"	9.0	Open cluster	39.0
NGC6704	18h 51m 59.2s	–05° 10' 36"	9.2	Open cluster	6.0
NGC6535	18h 05m 01.6s	–00° 17' 38"	9.3	Globular cluster	3.4
NGC6683	18h 43m 26.7s	–06° 11' 19"	9.4	Open cluster	3.0
NGC6342	17h 22m 31.7s	–19° 36' 28"	9.5	Globular cluster	4.4
NGC6366	17h 28m 57.7s	–05° 05' 37"	9.5	Globular cluster	13.0
NGC5846	15h 07m 39.1s	+01° 31' 03"	10.0	Galaxy	4.0 x 3.7
NGC6639	18h 32m 15.6s	–13° 09' 11"	10.0	Open cluster	5.0
NGC6517	18h 03m 06.2s	–08° 57' 25"	10.1	Globular cluster	4.0
IC1276	18h 12m 00.3s	–07° 12' 17"	10.3	Globular cluster	8.0
NGC6384	17h 33m 31.2s	+07° 02' 45"	10.4	Galaxy	6.2 x 4.1
NGC5813	15h 02m 21.2s	+01° 36' 44"	10.5	Galaxy	4.0 x 2.8
IC4593	16h 12m 49.4s	+12° 00' 50"	10.7	Planetary nebula	42.0"
NGC5850	15h 08m 17.6s	+01° 27' 24"	10.8	Galaxy	4.5 x 3.9
NGC5921	15h 23m 04.9s	+04° 59' 21"	10.8	Galaxy	4.8 x 4.0
NGC5838	15h 06m 35.9s	+02° 00' 39"	10.9	Galaxy	4.2 x 1.5
NGC6426	17h 46m 03.7s	+03° 09' 46"	10.9	Globular cluster	4.2
NGC6567	18h 15m 06.4s	–19° 04' 03"	11.0	Planetary nebula	12.0"
NGC6596	18h 18m 52.9s	–16° 38' 23"	11.0	Open cluster	10.0

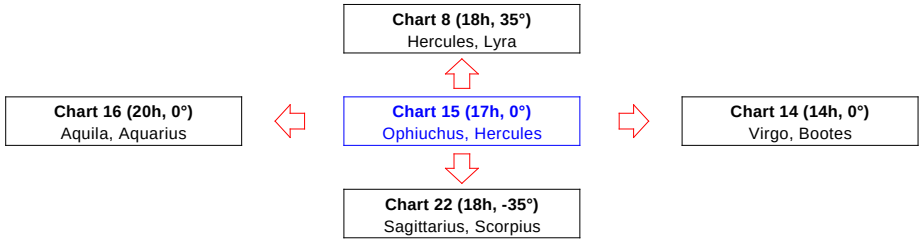
Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
H 3 7 AC	16h 08m 07.0s	–19° 55' 36"	2.59 / 4.52	13.4 / 20
PWL 9001 AD	16h 08m 07.0s	–19° 55' 36"	2.62 / 7.50	518.2 / 30
CSN 9 AD	17h 32m 46.6s	–01° 05' 40"	3.82 / 5.50	16.9 / 317
H 6 2 AC	18h 02m 57.3s	+02° 56' 01"	3.96 / 8.06	54.7 / 143
LUH 11 (σ Ser)	16h 24m 24.5s	+00° 55' 26"	4.09 / 7.82	43.0 / 132
H 5 6 AC	16h 14m 40.9s	–19° 34' 32"	4.35 / 6.60	41.3 / 336
STF 2417 AB (Alya)	18h 58m 30.0s	+04° 16' 01"	4.59 / 4.93	22.4 / 106
STF 2417 AC	18h 58m 30.0s	+04° 16' 01"	4.59 / 6.78	421.0 / 58
STF 2417 BC	18h 58m 32.0s	+04° 15' 56"	4.93 / 6.78	405.6 / 56
STF 2010 AB (Marfik)	16h 10m 09.8s	+16° 55' 40"	5.10 / 6.21	27.0 / 14
STFA 31 AB (37 Her)	16h 42m 56.2s	+04° 08' 03"	5.76 / 6.92	69.3 / 229
STFA 34 AB (53 Oph)	17h 36m 48.1s	+09° 33' 34"	5.80 / 7.50	41.3 / 190
STF 2379 AB (5 Aql)	18h 48m 51.4s	–00° 54' 32"	5.88 / 7.02	12.5 / 121
STFA 33 AB	17h 05m 46.0s	+13° 32' 40"	5.91 / 6.17	304.9 / 117
STF 2202 AB (61 Oph)	17h 46m 52.7s	+02° 33' 49"	6.13 / 6.47	20.8 / 93
H 6 50 AC	18h 52m 08.6s	–05° 51' 23"	6.15 / 8.23	111.8 / 171
SHJ 251 AB	17h 41m 27.3s	+02° 00' 22"	6.37 / 7.78	111.3 / 328
WEB 6	16h 37m 29.9s	+16° 57' 57"	6.41 / 7.26	155.5 / 0
STF 1962 (178 Lib)	15h 41m 09.3s	–08° 56' 18"	6.44 / 6.49	11.7 / 189
SHY 696 AE	16h 08m 12.5s	–06° 24' 44"	6.46 / 7.90	260.0 / 271
S 694	17h 54m 25.3s	+01° 06' 13"	6.67 / 7.26	79.3 / 238
TOK 620	18h 58m 54.0s	+04° 19' 44"	6.78 / 8.10	842.1 / 270
TOB 271 AC	18h 09m 24.9s	+15° 55' 33"	6.82 / 8.31	112.2 / 340
SHJ 264 AB,C	18h 21m 25.1s	–18° 35' 50"	6.86 / 7.63	17.2 / 51
BU 966 AG	18h 34m 35.5s	–19° 05' 17"	6.87 / 8.00	429.6 / 254
STF 2007 AB	16h 08m 11.7s	+13° 12' 00"	6.89 / 7.98	37.7 / 322

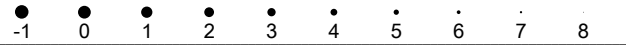
Main variable stars

Name	RA (J2023)	DEC	Magnitude	Max/Per (d)	Type
Ras Algethi (α_1 Her)	17h 15m 41.8s	+14° 21' 56"	2.74 / 4.0		P - Sem
δ Lib	15h 02m 12.3s	–08° 36' 32"	4.91 / 5.90	2.33	Ecl - Alg
U Sgr	18h 33m 14.6s	–19° 06' 25"	6.28 / 7.15	6.75	P - δ Ce
R Ser	15h 51m 45.4s	+15° 03' 55"	5.16 / 14.4	Apr 30 / 356	P - Mira
R Oph	17h 09m 05.1s	–16° 07' 17"	7.0 / 13.8	Jun 11 / 307	P - Mira
X Oph	18h 39m 27.1s	+08° 51' 21"	5.9 / 9.2	Aug 8 / 329	P - Mira
S Her	16h 52m 56.8s	+14° 54' 17"	6.4 / 13.8	Apr 23 / 307	P - Mira
V Oph	16h 28m 00.7s	–12° 28' 37"	7.3 / 11.6	Jan 2, Oct 26 / 297	P - Mira
U Her	16h 26m 48.5s	+18° 50' 29"	6.4 / 13.4	Jan 19 / 406	P - Mira

Navigation map



Stellar magnitudes



Types of stars

Symbols for deep sky objects (star cluster, nebula, galaxy) and constellation figure/boundary

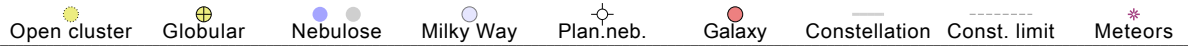
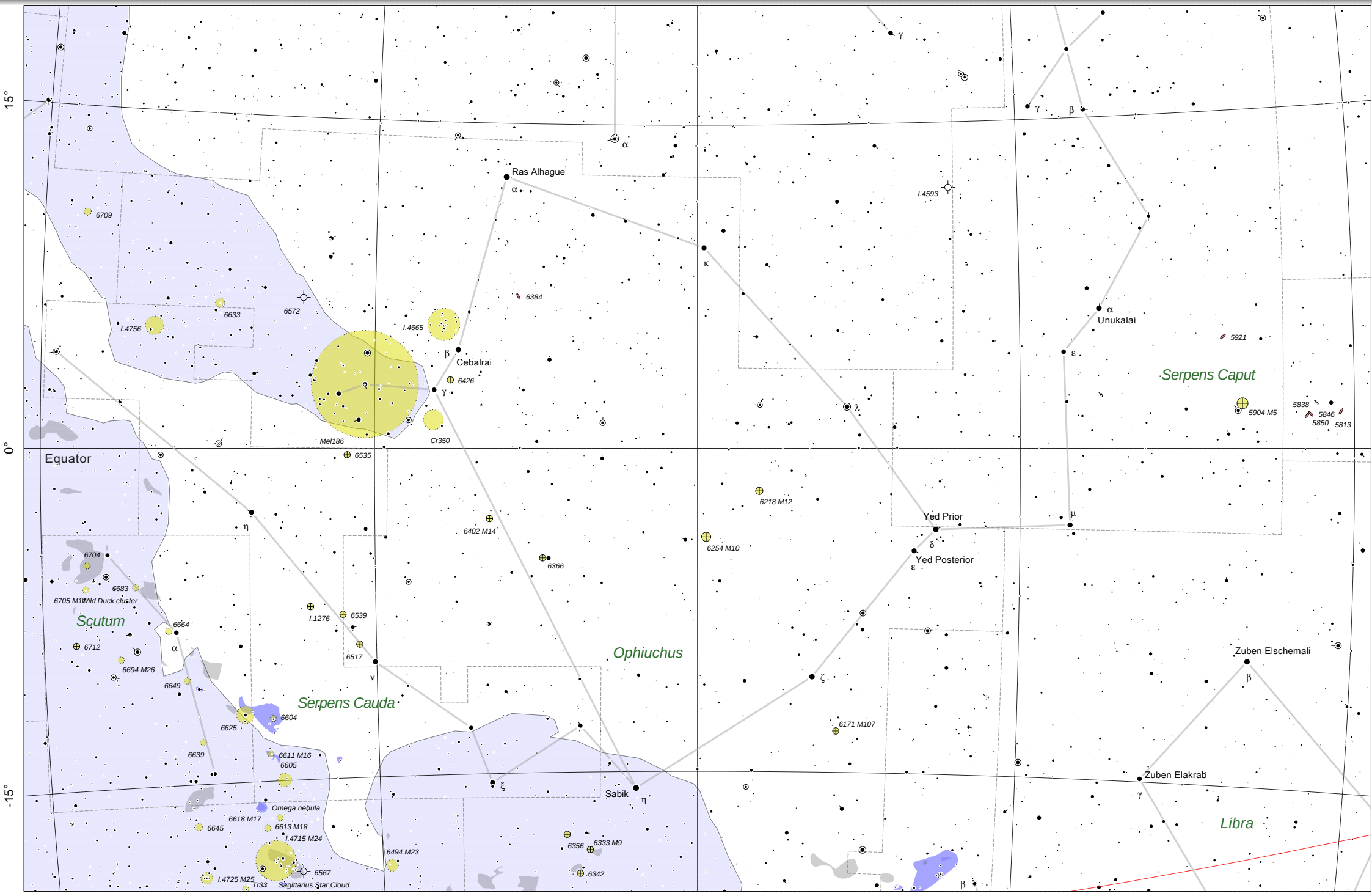


Chart 15, 30º around 17.0h, 0.0º (Ophiuchus, Hercules, Serpens Caput, Scorpius)



Main objects visible on chart 16

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
Mel186	18h 01m 45.1s	+02° 56' 02"	3.0	Open cluster	4.0°
Col399	19h 26m 24.2s	+20° 13' 49"	3.6	Open cluster	60.0
NGC6633	18h 28m 22.3s	+06° 31' 26"	4.6	Open cluster	20.0
IC4725 M25	18h 33m 06.3s	–19° 06' 07"	4.6	Open cluster	26.0
IC4756	18h 40m 01.8s	+05° 27' 19"	4.6	Open cluster	40.0
IC4715 M24 - Sagittarius Star Cloud	18h 20m 09.0s	–18° 32' 21"	5.0	Open cluster	1.50°
NGC6494 M23	17h 58m 17.3s	–19° 00' 47"	5.5	Open cluster	25.0
NGC6705 M11 - Wild Duck cluster	18h 52m 19.0s	–06° 14' 29"	5.8	Open cluster	11.0
NGC6618 M17 - Omega nebula	18h 22m 06.6s	–16° 09' 35"	6.0	Nebula	20.0 x 15.0
NGC6605	18h 17m 42.9s	–14° 59' 26"	6.0	Open cluster	29.0
NGC6611 M16	18h 20m 03.2s	–13° 47' 15"	6.0	Open cluster	8.0
NGC7078 M15	21h 31m 05.0s	+12° 16' 09"	6.3	Globular cluster	18.0
NGC6604	18h 19m 23.4s	–12° 12' 22"	6.5	Open cluster	6.0
NGC7089 M2	21h 34m 38.2s	–00° 43' 11"	6.6	Globular cluster	16.0
NGC6709	18h 52m 35.3s	+10° 21' 44"	6.7	Open cluster	15.0
NGC6613 M18	18h 21m 18.1s	–17° 05' 25"	6.9	Open cluster	7.0
NGC6716	18h 55m 55.5s	–19° 52' 40"	7.5	Open cluster	10.0
NGC6755	19h 08m 57.5s	+04° 18' 16"	7.5	Open cluster	15.0
NGC6664	18h 37m 45.7s	–08° 10' 01"	7.8	Open cluster	12.0
NGC6694 M26	18h 46m 30.7s	–09° 21' 34"	8.0	Open cluster	8.0
NGC7009 CALDWELL 55 - Saturn nebula	21h 05m 25.8s	–11° 16' 14"	8.0	Planetary nebula	1.0 x 0.6
NGC6572	18h 13m 13.4s	+06° 51' 40"	8.1	Planetary nebula	15.0"
NGC6712	18h 54m 19.6s	–08° 40' 33"	8.1	Globular cluster	9.8
NGC6838 M71	19h 54m 47.6s	+18° 50' 24"	8.4	Globular cluster	7.2
NGC6645	18h 33m 57.7s	–16° 51' 55"	8.5	Open cluster	15.0
Tr33	18h 26m 03.7s	–19° 42' 09"	8.5	Open cluster	5.5
NGC6822 CALDWELL 57 - Barnard's galaxy	19h 46m 14.6s	–14° 44' 58"	8.7	Galaxy	15.4 x 14.2
NGC6802	19h 31m 36.3s	+20° 18' 40"	8.8	Open cluster	5.0
NGC6539	18h 06m 04.6s	–07° 34' 56"	8.9	Globular cluster	7.9
NGC6649	18h 34m 44.6s	–10° 22' 60"	8.9	Open cluster	6.0
NGC6934 CALDWELL 47	20h 35m 19.2s	+07° 29' 05"	8.9	Globular cluster	7.1
NGC6625	18h 24m 30.0s	–11° 59' 59"	9.0	Open cluster	39.0
NGC6760	19h 12m 22.3s	+01° 04' 14"	9.0	Globular cluster	9.6
NGC6704	18h 51m 59.2s	–05° 10' 36"	9.2	Open cluster	6.0
NGC6981 M72	20h 54m 43.6s	–12° 26' 54"	9.2	Globular cluster	6.6
NGC6535	18h 05m 01.6s	–00° 17' 38"	9.3	Globular cluster	3.4
NGC6818	19h 45m 15.5s	–14° 05' 46"	9.3	Planetary nebula	0.8
NGC6683	18h 43m 26.7s	–06° 11' 19"	9.4	Open cluster	3.0
NGC6639	18h 32m 15.6s	–13° 09' 11"	10.0	Open cluster	5.0
NGC6517	18h 03m 06.2s	–08° 57' 25"	10.1	Globular cluster	4.0
IC1276	18h 12m 00.3s	–07° 12' 17"	10.3	Globular cluster	8.0
NGC6790	19h 24m 07.0s	+01° 33' 33"	10.5	Planetary nebula	10.2"
NGC6891	20h 16m 13.9s	+12° 46' 34"	10.5	Planetary nebula	21.0"
IC4997	20h 21m 12.0s	+16° 48' 22"	10.5	Planetary nebula	13.2"
NGC6756	19h 09m 50.8s	+04° 44' 38"	10.6	Open cluster	4.0
NGC7006 CALDWELL 42	21h 02m 34.0s	+16° 16' 46"	10.6	Globular cluster	3.6
NGC6567	18h 15m 06.4s	–19° 04' 03"	11.0	Planetary nebula	12.0"
NGC6596	18h 18m 52.9s	–16° 38' 23"	11.0	Open cluster	10.0
NGC6774	19h 17m 37.2s	–16° 16' 58"	11.0	Open cluster	20.0
NGC6964 CALDWELL 12	20h 48m 34.8s	+00° 23' 13"	13.0	Galaxy	1.7 x 1.3

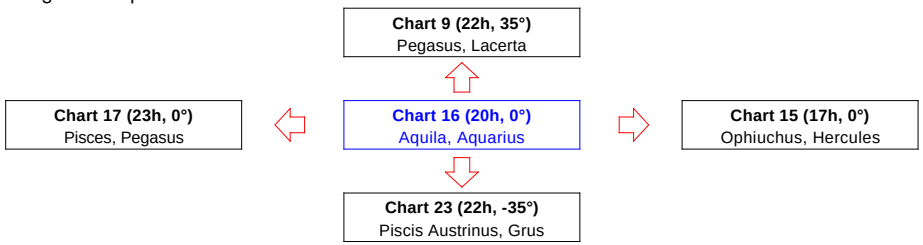
Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
STFA 52 AB (Dabih)	20h 23m 35.6s	–14° 37' 57"	3.15 / 6.08	205.4 / 267
EHR 16 AB (λ Aql)	19h 08m 41.4s	–04° 48' 28"	3.50 / 7.50	12.5 / 30
STFA 51 AE	20h 20m 35.6s	–12° 23' 54"	3.66 / 4.34	381.2 / 290
H 6 2 AC	18h 02m 57.3s	+02° 56' 01"	3.96 / 8.06	54.7 / 143
STF 2417 AB (Alya)	18h 58m 30.0s	+04° 16' 01"	4.59 / 4.93	22.4 / 106
STF 2417 AC	18h 58m 30.0s	+04° 16' 01"	4.59 / 6.78	421.0 / 58
STFA 54 AD	21h 12m 34.0s	+10° 19' 19"	4.70 / 6.06	335.2 / 152
STF 2417 BC	18h 58m 32.0s	+04° 15' 56"	4.93 / 6.78	405.6 / 56
SHJ 323 AD	20h 31m 29.0s	–17° 39' 27"	4.97 / 6.68	258.7 / 150
STF 2737 AB,C	21h 01m 23.1s	+04° 28' 31"	5.30 / 7.05	10.6 / 67
HJ 599 AC	19h 43m 20.6s	–16° 10' 58"	5.42 / 7.65	45.5 / 41
SHJ 286 (15 Aql)	19h 07m 23.6s	–03° 57' 30"	5.52 / 6.98	39.6 / 211
STF 2594 AB (57 Aql)	19h 57m 07.2s	–08° 06' 11"	5.65 / 6.35	36.3 / 171
STTA 178	19h 17m 25.8s	+15° 10' 03"	5.69 / 7.64	89.6 / 267
H 6 26 AB (ϵ Sge)	19h 39m 21.9s	+16° 34' 09"	5.77 / 8.35	87.4 / 82
STT 592 AC	20h 06m 11.3s	+17° 12' 12"	5.86 / 6.92	217.0 / 335
STF 2379 AB (5 Aql)	18h 48m 51.4s	–00° 54' 32"	5.88 / 7.02	12.5 / 121
SHJ 324 AB (o Cap)	20h 32m 31.7s	–18° 25' 34"	5.91 / 6.68	22.0 / 239
H 6 50 AC	18h 52m 08.6s	–05° 51' 23"	6.15 / 8.23	111.8 / 171
STFA 56 AB (3 Peg)	21h 40m 01.3s	+06° 49' 39"	6.18 / 7.50	39.3 / 348
STFA 41 AB (2 Sge)	19h 26m 26.0s	+17° 01' 52"	6.26 / 6.86	342.3 / 78
STF 2737 BC	21h 01m 22.1s	+04° 28' 29"	6.31 / 7.05	10.6 / 66
STFA 40 AB (24 Aql)	19h 21m 12.1s	+00° 25' 35"	6.52 / 6.78	423.5 / 316
S 749 AB	20h 29m 51.2s	–01° 56' 53"	6.76 / 7.51	60.1 / 189
TOK 620	18h 58m 54.0s	+04° 19' 44"	6.78 / 8.10	842.1 / 270

Main variable stars

Name	RA (J2023)	DEC	Magnitude	Max/Per (d)	Type
η Aql	19h 53m 38.6s	+01° 03' 58"	3.48 / 4.39	7.18	P - δ Cep
R Sgr	19h 18m 02.7s	–19° 15' 55"	6.7 / 12.83	Mar 8, Dec 3 / 270	P - Mira
U Sgr	18h 33m 14.6s	–19° 06' 25"	6.28 / 7.15	6.75	P - δ Cep
U Sge	19h 19m 48.8s	+19° 39' 14"	6.45 / 9.28	3.38	Ecl - Algol
U Del	20h 46m 31.4s	+18° 10' 29"	7.6 / 8.9	110	P - Semi-irr
U Vul	19h 37m 38.1s	+20° 23' 08"	6.73 / 7.54	7.99	P - δ Cep
X Oph	18h 39m 27.1s	+08° 51' 21"	5.9 / 9.2	Aug 8 / 329	P - Mira
R Aql	19h 07m 28.7s	+08° 15' 59"	5.5 / 12.0	Sep 8 / 284	P - Mira
V Aqr	20h 47m 59.1s	+02° 31' 23"	7.6 / 9.4	244.0	P - Semi-irr
S Del	20h 44m 08.5s	+17° 10' 19"	8.3 / 12.4	Aug 9 / 278	P - Mira

Navigation map

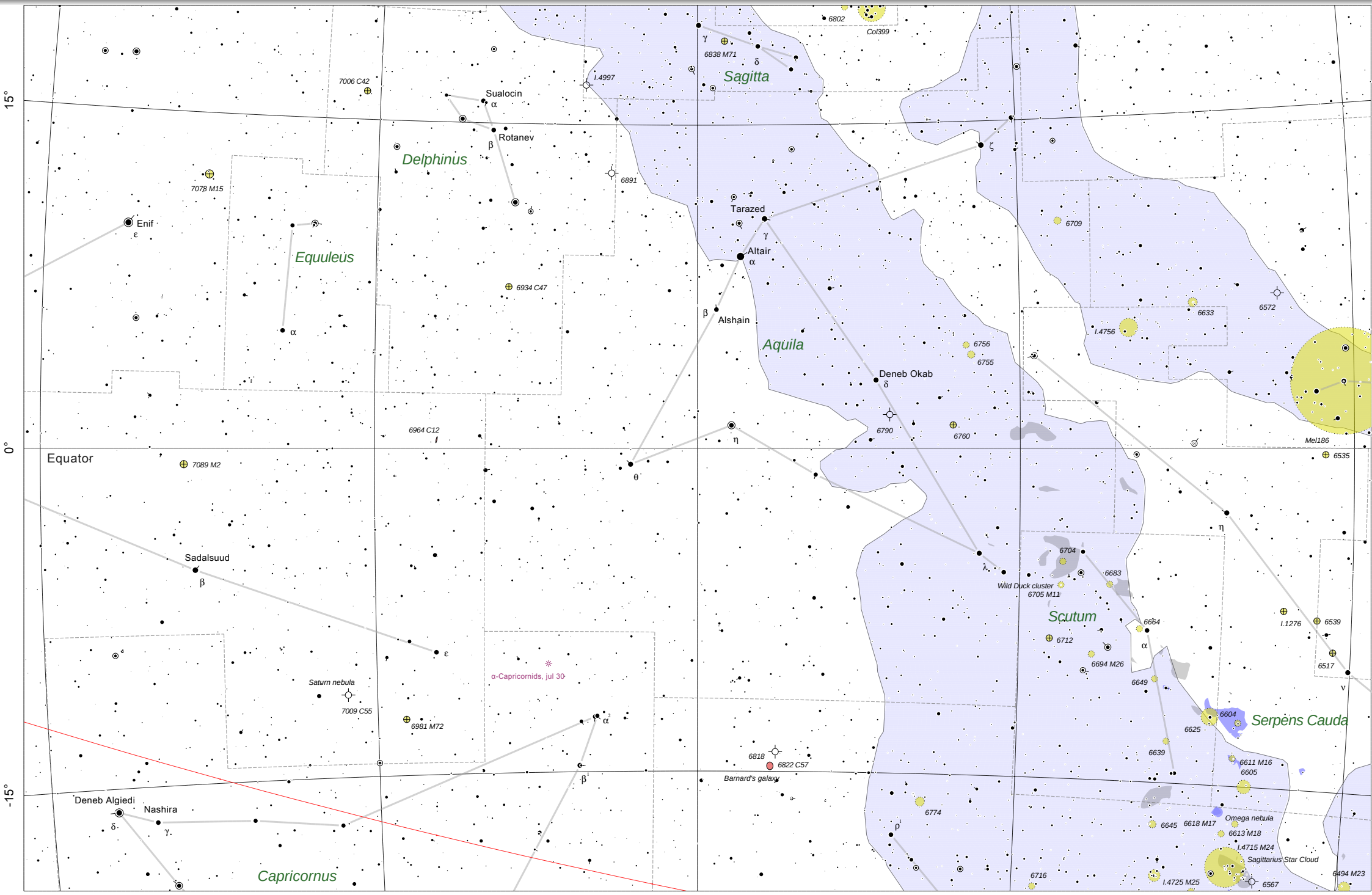


Stellar magnitudes

Types of stars

Symbols for deep sky objects (star cluster, nebula, galaxy) and constellation figure/boundary

Chart 16, 30º around 20.0h, 0.0º (Aquila, Aquarius, Delphinus, Sagittarius)



Main objects visible on chart 17

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
NGC7078 M15	21h 31m 05.0s	+12° 16' 09"	6.3	Globular cluster	18.0
NGC7089 M2	21h 34m 38.2s	–00° 43' 11"	6.6	Globular cluster	16.0
NGC7293 CALDWELL 63 - Helix nebula	22h 30m 53.6s	–20° 43' 05"	7.3	Planetary nebula	17.6
NGC7009 CALDWELL 55 - Saturn nebula	21h 05m 25.8s	–11° 16' 14"	8.0	Planetary nebula	1.0 x 0.6
NGC157	00h 35m 56.4s	–08° 16' 11"	10.4	Galaxy	3.5 x 2.4
NGC7006 CALDWELL 42	21h 02m 34.0s	+16° 16' 46"	10.6	Globular cluster	3.6
NGC7727	23h 41m 05.0s	–12° 09' 55"	10.6	Galaxy	4.7 x 3.5
NGC7814 CALDWELL 43	00h 04m 25.7s	+16° 16' 24"	10.6	Galaxy	5.5 x 2.3
NGC7606	23h 20m 16.3s	–08° 21' 37"	10.8	Galaxy	5.4 x 2.1
NGC210	00h 41m 44.2s	–13° 44' 47"	10.9	Galaxy	5.0 x 3.3
NGC246 CALDWELL 56 - Skull nebula	00h 48m 12.7s	–11° 44' 46"	10.9	Planetary nebula	4.1
NGC7479 CALDWELL 44	23h 06m 05.8s	+12° 26' 48"	10.9	Galaxy	4.0 x 3.1

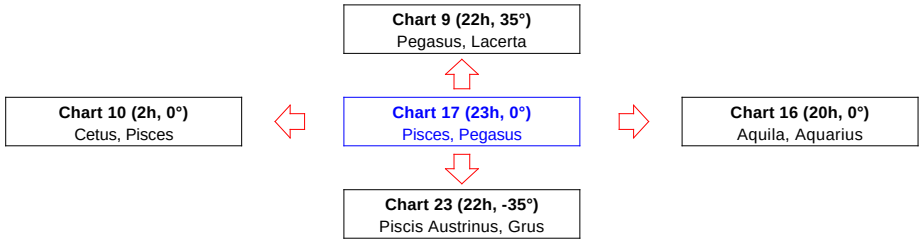
Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
STFA 54 AD	21h 12m 34.0s	+10° 19' 19"	4.70 / 6.06	335.2 / 152
STF 2998 AB (94 Aqr)	23h 21m 31.0s	–13° 12' 23"	5.27 / 6.97	12.1 / 353
STF 2737 AB,C	21h 01m 23.1s	+04° 28' 31"	5.30 / 7.05	10.6 / 67
STFA 59 AB,C	23h 07m 33.3s	–07° 26' 41"	5.47 / 7.21	257.6 / 149
HJ 323	00h 43m 02.6s	–04° 06' 00"	6.01 / 8.46	63.0 / 286
STF 12 (35 Psc)	00h 17m 21.1s	+09° 04' 36"	6.06 / 7.51	11.2 / 148
STFA 56 AB (3 Peg)	21h 40m 01.3s	+06° 49' 39"	6.18 / 7.50	39.3 / 348
STF 2737 BC	21h 01m 22.1s	+04° 28' 29"	6.31 / 7.05	10.6 / 66
STF 2841 A,BC	21h 56m 27.0s	+19° 56' 14"	6.45 / 7.99	22.4 / 110
HJ 1981 A,BC	00h 33m 19.9s	–09° 49' 52"	6.91 / 8.43	78.4 / 89

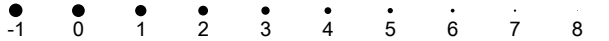
Main variable stars

Name	RA (J2023)	DEC	Magnitude	Max/Per (d)	Type
R Peg	23h 07m 48.6s	+10° 40' 05"	6.9 / 13.8	Jul 14 / 378	P - Mira

Navigation map



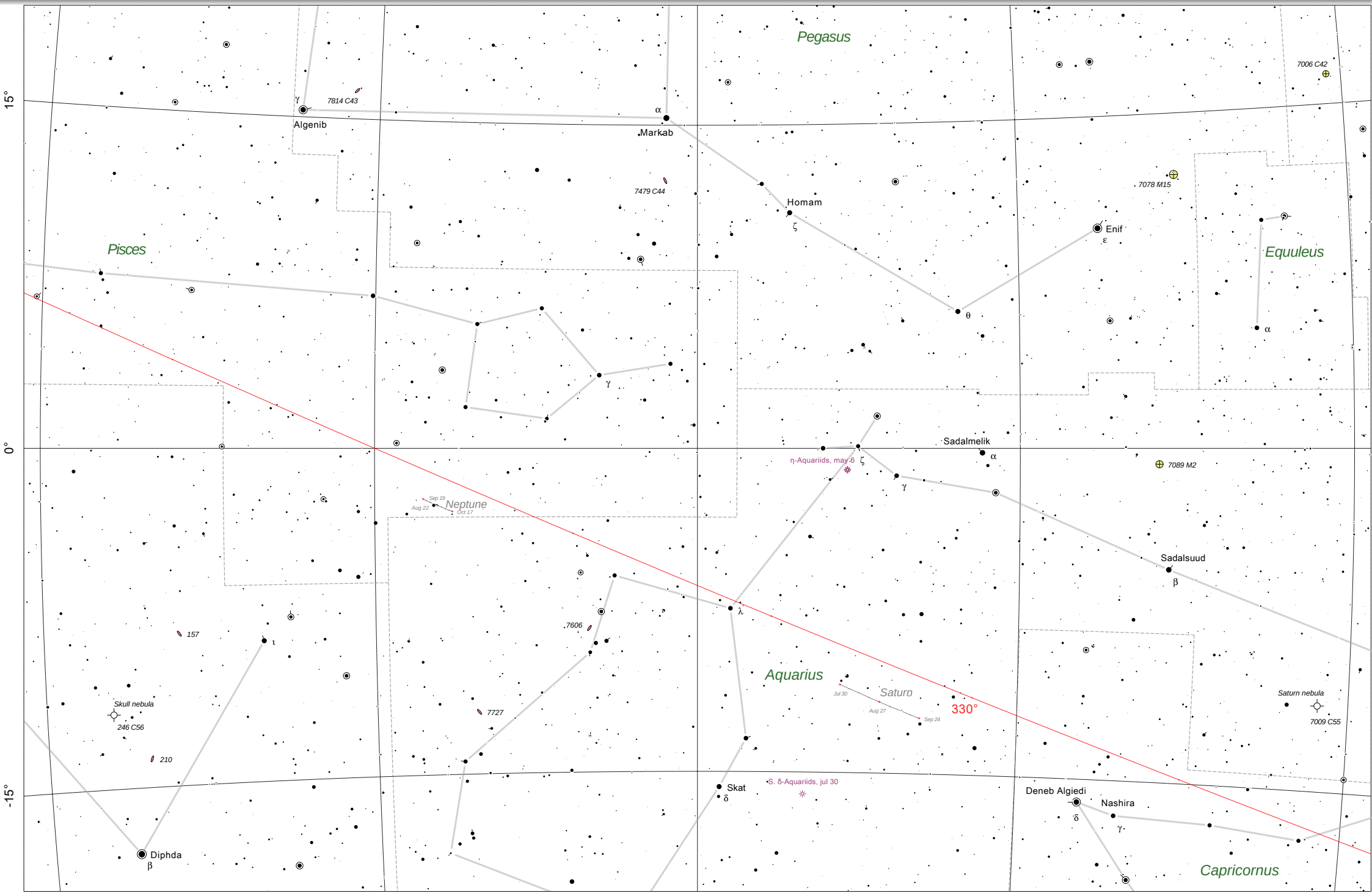
Stellar magnitudes



Types of stars

Symbols for deep sky objects (star cluster, nebula, galaxy) and constellation figure/boundary

Chart 17, 30º around 23.0h, 0.0º (Pisces, Pegasus, Aquarius, Cetus)



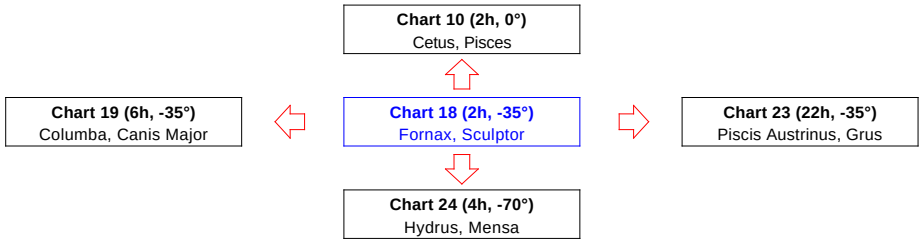
Main objects visible on chart 18

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
NGC253 CALDWELL 65 - Sculptor galaxy	00h 48m 40.8s	–25° 09' 44"	7.2	Galaxy	29.0 x 6.8
NGC55 CALDWELL 72	00h 16m 17.0s	–39° 05' 30"	7.9	Galaxy	31.2 x 5.9
NGC288	00h 53m 52.7s	–26° 28' 22"	8.1	Globular cluster	13.0
NGC300 CALDWELL 70	00h 55m 58.4s	–37° 33' 35"	8.1	Galaxy	19.0 x 12.9
NGC1291	03h 18m 08.7s	–41° 01' 26"	8.5	Galaxy	11.0 x 9.5
NGC1316 - Fornax A	03h 23m 34.1s	–37° 07' 37"	8.5	Galaxy	11.0 x 7.2
NGC247 CALDWELL 62	00h 48m 16.6s	–20° 38' 05"	9.1	Galaxy	19.2 x 5.5
NGC7793	23h 59m 00.1s	–32° 27' 49"	9.1	Galaxy	9.3 x 6.3
NGC1360	03h 34m 13.4s	–25° 47' 41"	9.4	Planetary nebula	6.4
NGC1097 CALDWELL 67	02h 47m 18.3s	–30° 10' 48"	9.5	Galaxy	9.4 x 6.6
NGC1365	03h 34m 29.4s	–36° 03' 53"	9.6	Galaxy	11.0 x 6.2
NGC1395	03h 39m 29.7s	–22° 57' 12"	9.6	Galaxy	5.0 x 4.5
NGC1399	03h 39m 21.8s	–35° 22' 33"	9.6	Galaxy	6.9 x 6.5
NGC1398	03h 39m 50.3s	–26° 15' 49"	9.7	Galaxy	7.2 x 5.2
NGC1407	03h 41m 14.1s	–18° 30' 26"	9.7	Galaxy	4.6 x 4.3
NGC1232	03h 10m 47.5s	–20° 29' 34"	9.9	Galaxy	7.4 x 6.5
NGC1380	03h 37m 20.8s	–34° 54' 02"	9.9	Galaxy	4.0 x 2.4
NGC1433	03h 42m 44.6s	–47° 08' 59"	9.9	Galaxy	6.5 x 5.9
NGC1532	04h 12m 56.8s	–32° 48' 55"	9.9	Galaxy	11.6 x 3.4
NGC1404	03h 39m 44.5s	–35° 31' 08"	10.0	Galaxy	3.3 x 3.0
NGC613	01h 35m 22.2s	–29° 18' 05"	10.1	Galaxy	5.5 x 4.2
NGC908	02h 24m 08.3s	–21° 07' 47"	10.2	Galaxy	6.1 x 2.7
NGC1332	03h 27m 18.3s	–21° 15' 18"	10.3	Galaxy	4.5 x 1.4
NGC1350	03h 32m 02.3s	–33° 32' 60"	10.3	Galaxy	5.9 x 3.1
NGC1512	04h 04m 39.4s	–43° 17' 13"	10.3	Galaxy	8.9 x 5.6
NGC134	00h 31m 29.8s	–33° 07' 05"	10.4	Galaxy	8.4 x 1.8
NGC1300	03h 20m 43.1s	–19° 19' 45"	10.4	Galaxy	6.2 x 4.1
NGC1344	03h 29m 15.6s	–30° 59' 22"	10.4	Galaxy	4.8 x 3.1
NGC1326	03h 24m 49.5s	–36° 23' 02"	10.5	Galaxy	3.9 x 2.9
IC5332	23h 35m 40.6s	–35° 58' 27"	10.5	Galaxy	8.9 x 8.2
PGC3589 - Sculptor dwarf	01h 00m 59.4s	–33° 34' 35"	10.5	Galaxy	75.0
NGC45	00h 15m 13.9s	–23° 03' 13"	10.6	Galaxy	8.5 x 5.9
NGC1425	03h 43m 07.7s	–29° 49' 19"	10.6	Galaxy	5.8 x 2.5
NGC1537	04h 14m 34.5s	–31° 35' 19"	10.6	Galaxy	3.9 x 2.6
NGC7552 - Grus quartet	23h 17m 26.6s	–42° 27' 32"	10.6	Galaxy	3.4 x 2.7
NGC7582	23h 19m 39.2s	–42° 14' 37"	10.6	Galaxy	5.0 x 2.3
NGC1201	03h 05m 07.8s	–25° 58' 49"	10.7	Galaxy	3.6 x 2.1
NGC1302	03h 20m 50.3s	–25° 58' 42"	10.7	Galaxy	3.9 x 3.7
NGC1371	03h 36m 00.4s	–24° 51' 28"	10.7	Galaxy	5.6 x 3.9
NGC1387	03h 37m 50.1s	–35° 25' 52"	10.7	Galaxy	2.8 x 2.6
NGC1457	03h 45m 16.8s	–44° 34' 29"	10.7	Galaxy	7.6 x 1.7
NGC1187	03h 03m 39.1s	–22° 46' 41"	10.8	Galaxy	4.2 x 3.2
NGC1527	04h 09m 04.8s	–47° 50' 13"	10.8	Galaxy	3.9 x 1.5
NGC210	00h 41m 44.2s	–13° 44' 47"	10.9	Galaxy	5.0 x 3.3
NGC578	01h 31m 34.7s	–22° 32' 55"	10.9	Galaxy	4.8 x 3.0
NGC986	02h 34m 29.3s	–38° 56' 44"	10.9	Galaxy	4.0 x 3.2
NGC1255	03h 14m 31.7s	–25° 38' 23"	10.9	Galaxy	4.2 x 2.7
NGC1379	03h 36m 56.8s	–35° 21' 57"	10.9	Galaxy	2.4 x 2.3
NGC1385	03h 38m 27.9s	–24° 25' 42"	10.9	Galaxy	3.6 x 2.2
NGC1427	03h 43m 11.9s	–35° 19' 14"	10.9	Galaxy	3.8 x 2.6

Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
SHY 834 AC	23h 37m 32.3s	–42° 21' 37"	4.70 / 6.68	294.1 / 212
SHY 836	23h 41m 22.9s	–45° 21' 24"	4.74 / 7.05	804.4 / 122
HJ 3506 (ω For)	02h 35m 51.9s	–28° 01' 57"	4.95 / 7.71	11.0 / 246
SHY 140 (ϕ For)	02h 29m 58.6s	–33° 36' 26"	5.14 / 7.64	391.1 / 218
SKF 949	03h 54m 58.6s	–46° 45' 36"	6.06 / 8.47	76.4 / 3
SKF 760 (AL Scl)	23h 57m 39.0s	–31° 39' 55"	6.09 / 6.82	133.9 / 1
SKF 1280 A,BC (χ_1 For)	03h 27m 42.6s	–35° 45' 44"	6.40 / 7.34	140.0 / 164
LDS 21	00h 38m 47.9s	–48° 52' 47"	6.85 / 8.48	329.7 / 273
HJ 2052	01h 33m 47.2s	–18° 47' 15"	6.86 / 7.47	80.8 / 114

Navigation map

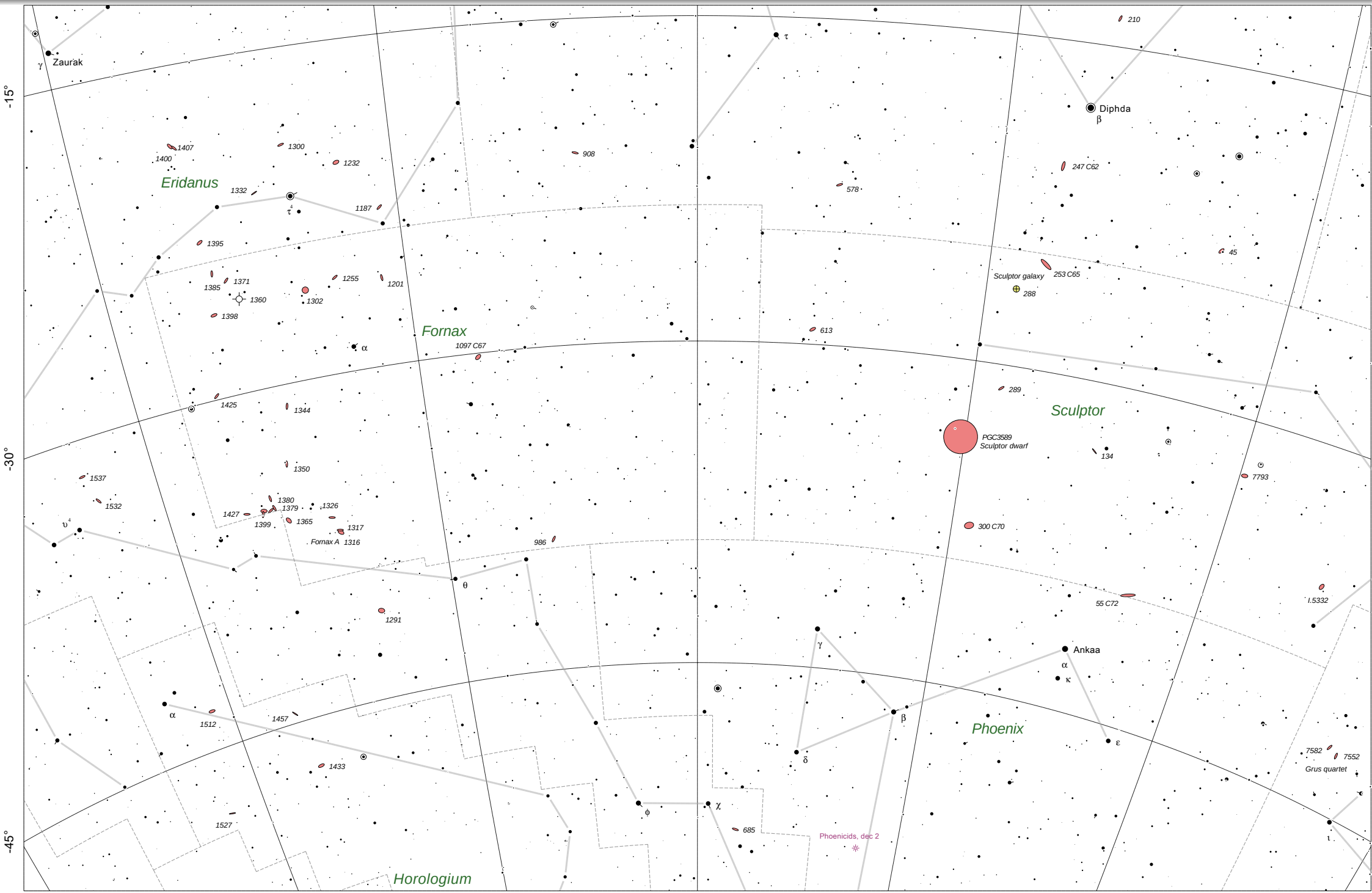


Stellar magnitudes: -1 0 1 2 3 4 5 6 7 8

Types of stars: Double Variable

Symbols for deep sky objects (star cluster, nebula, galaxy) and constellation figure/boundary: Open cluster Globular Nebulose Milky Way Plan.neb. Galaxy Constellation Const. limit Meteors

Chart 18, 30º around 2.0h, -35.0º (Fornax, Sculptor, Phoenix, Cetus)



Main objects visible on chart 19

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
NGC2451	07h 46m 13.3s	–38° 00' 25"	2.8	Open cluster	50.0
NGC2362 CALDWELL 64 - Tau Canis Majoris Cluster	07h 19m 38.7s	–24° 59' 51"	3.8	Open cluster	6.0
NGC2422 M47	07h 37m 38.5s	–14° 31' 57"	4.4	Open cluster	25.0
NGC2287 M41	06h 46m 59.3s	–20° 46' 57"	4.5	Open cluster	39.0
IC2395	08h 43m 14.7s	–48° 11' 31"	4.6	Open cluster	13.0
NGC2547	08h 10m 49.7s	–49° 17' 39"	4.7	Open cluster	25.0
NGC2477 CALDWELL 71	07h 52m 59.1s	–38° 35' 25"	5.8	Open cluster	20.0
NGC2437 M46	07h 42m 50.2s	–14° 51' 55"	6.1	Open cluster	20.0
NGC2447 M93	07h 45m 28.5s	–23° 54' 48"	6.2	Open cluster	10.0
NGC2546	08h 13m 14.9s	–37° 41' 12"	6.3	Open cluster	70.0
NGC2354	07h 15m 06.7s	–25° 43' 51"	6.5	Open cluster	18.0
NGC2527	08h 05m 54.8s	–28° 12' 46"	6.5	Open cluster	10.0
NGC2423	07h 38m 10.5s	–13° 55' 28"	6.7	Open cluster	12.0
NGC2439	07h 41m 39.0s	–31° 44' 50"	6.9	Open cluster	9.0
NGC2571	08h 19m 52.6s	–29° 49' 20"	7.0	Open cluster	7.0
NGC2645	08h 39m 49.2s	–46° 18' 33"	7.0	Open cluster	3.0
NGC1851 CALDWELL 73	05h 14m 51.7s	–40° 01' 17"	7.1	Globular cluster	12.0
NGC2360 CALDWELL 58	07h 18m 45.7s	–15° 41' 03"	7.2	Open cluster	14.0
NGC2409	07h 32m 38.7s	–17° 14' 23"	7.3	Open cluster	2.5
NGC2482	07h 56m 10.6s	–24° 19' 13"	7.3	Open cluster	10.0
NGC2384	07h 26m 09.7s	–21° 04' 06"	7.4	Open cluster	5.0
NGC2567	08h 19m 27.7s	–30° 42' 47"	7.4	Open cluster	11.0
NGC2579	08h 21m 45.0s	–36° 17' 25"	7.5	Open cluster	19.0
NGC2483	07h 56m 35.5s	–27° 57' 26"	7.6	Open cluster	9.0
NGC2533	08h 07m 59.7s	–29° 56' 03"	7.6	Open cluster	6.0
NGC1904 M79	05h 25m 07.5s	–24° 30' 14"	7.7	Globular cluster	9.6
NGC2367	07h 21m 05.1s	–21° 55' 33"	7.9	Open cluster	5.0
NGC2414	07h 34m 15.7s	–15° 30' 17"	7.9	Open cluster	6.0
NGC2489	07h 57m 11.1s	–30° 07' 36"	7.9	Open cluster	5.0
NGC2374	07h 24m 60.0s	–13° 18' 34"	8.0	Open cluster	12.0
NGC2421	07h 37m 12.2s	–20° 39' 51"	8.3	Open cluster	8.0
NGC2453	07h 48m 30.7s	–27° 15' 10"	8.3	Open cluster	4.0
NGC2383	07h 25m 39.7s	–20° 59' 38"	8.4	Open cluster	5.0
NGC1291	03h 18m 08.7s	–41° 01' 26"	8.5	Galaxy	11.0 x 9.5
NGC1316 - Fornax A	03h 23m 34.1s	–37° 07' 37"	8.5	Galaxy	11.0 x 7.2
NGC2204	06h 16m 33.4s	–18° 40' 26"	8.6	Open cluster	10.0
NGC2659	08h 43m 23.4s	–45° 05' 01"	8.6	Open cluster	15.0
NGC2660	08h 43m 23.6s	–47° 17' 03"	8.8	Open cluster	3.0
Tr9	07h 56m 39.7s	–25° 56' 44"	9.1	Open cluster	7.0
NGC2587	08h 24m 20.6s	–29° 35' 02"	9.2	Open cluster	10.0
NGC2298	06h 49m 48.1s	–36° 01' 56"	9.3	Globular cluster	5.0
NGC2509	08h 01m 49.4s	–19° 06' 55"	9.3	Open cluster	12.0
NGC2243	06h 30m 26.6s	–31° 17' 53"	9.4	Open cluster	8.3
NGC2440	07h 42m 57.0s	–18° 15' 48"	9.4	Planetary nebula	1.3
NGC1365	03h 34m 29.4s	–36° 03' 53"	9.6	Galaxy	11.0 x 6.2
NGC1399	03h 39m 21.8s	–35° 22' 33"	9.6	Galaxy	6.9 x 6.5
NGC1535	04h 15m 20.3s	–12° 40' 56"	9.6	Planetary nebula	0.8
NGC2479	07h 56m 08.1s	–17° 46' 11"	9.6	Open cluster	11.0
NGC2580	08h 22m 24.1s	–30° 21' 58"	9.7	Open cluster	8.0
NGC1380	03h 37m 20.8s	–34° 54' 02"	9.9	Galaxy	4.0 x 2.4
NGC1433	03h 42m 44.6s	–47° 08' 59"	9.9	Galaxy	6.5 x 5.9
NGC1532	04h 12m 56.8s	–32° 48' 55"	9.9	Galaxy	11.6 x 3.4
NGC1808	05h 08m 30.2s	–37° 29' 05"	9.9	Galaxy	6.5 x 3.9
NGC1404	03h 39m 44.5s	–35° 31' 08"	10.0	Galaxy	3.3 x 3.0
NGC1792	05h 06m 01.2s	–37° 56' 59"	10.2	Galaxy	5.2 x 2.6
NGC2432	07h 41m 54.1s	–19° 07' 53"	10.2	Open cluster	7.0
NGC2455	07h 50m 00.1s	–21° 21' 38"	10.2	Open cluster	15.0
NGC1350	03h 32m 02.3s	–33° 32' 60"	10.3	Galaxy	5.9 x 3.1
NGC1512	04h 04m 39.4s	–43° 17' 13"	10.3	Galaxy	8.9 x 5.6
NGC2280	06h 45m 43.8s	–27° 39' 50"	10.3	Galaxy	6.3 x 3.0
NGC1326	03h 24m 49.5s	–36° 23' 02"	10.5	Galaxy	3.9 x 2.9
NGC1425	03h 43m 07.7s	–29° 49' 19"	10.6	Galaxy	5.8 x 2.5
NGC1537	04h 14m 34.5s	–31° 35' 19"	10.6	Galaxy	3.9 x 2.6
NGC1387	03h 37m 50.1s	–35° 25' 52"	10.7	Galaxy	2.8 x 2.6
NGC1457	03h 45m 16.8s	–44° 34' 29"	10.7	Galaxy	7.6 x 1.7
NGC2217	06h 22m 34.8s	–27° 14' 47"	10.7	Galaxy	4.7 x 4.3
NGC2568	08h 19m 09.7s	–37° 10' 41"	10.7	Open cluster	3.0
NGC1527	04h 09m 04.8s	–47° 50' 13"	10.8	Galaxy	3.9 x 1.5
NGC1964	05h 34m 20.2s	–21° 55' 51"	10.8	Galaxy	5.6 x 1.8
NGC2438	07h 42m 54.0s	–14° 47' 24"	10.8	Planetary nebula	1.3
NGC1379	03h 36m 56.8s	–35° 21' 57"	10.9	Galaxy	2.4 x 2.3

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
NGC1427	03h 43m 11.9s	–35° 19' 14"	10.9	Galaxy	3.8 x 2.6
NGC2207	06h 17m 20.5s	–21° 22' 56"	10.9	Galaxy	3.9 x 2.2
NGC2559	08h 18m 03.6s	–27° 31' 45"	10.9	Galaxy	3.0 x 1.4
NGC1317	03h 23m 36.9s	–37° 01' 21"	11.0	Galaxy	2.8 x 2.4
NGC2196	06h 13m 08.0s	–21° 48' 47"	11.0	Galaxy	2.8 x 2.2
NGC2292	06h 48m 35.0s	–26° 46' 23"	11.0	Galaxy	4.0 x 3.5

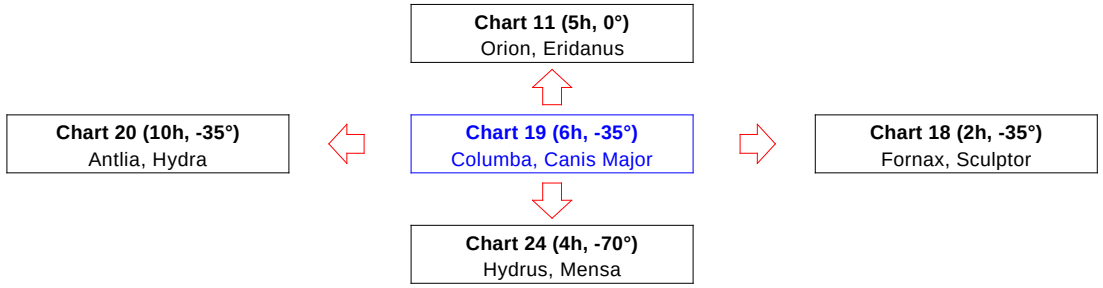
Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
AGC 1 AB (Sirio)	06h 47m 12.3s	–16° 46' 03"	-1.47 / 8.44	11.2 / 68
DUN 65 AB (Suhail al muhlif)	08h 10m 57.1s	–47° 28' 28"	1.79 / 4.14	41.2 / 221
DUN 65 AC	08h 10m 57.1s	–47° 28' 28"	1.79 / 7.26	61.5 / 152
SMY 2 (Aludra)	07h 25m 55.2s	–29° 23' 45"	2.45 / 6.77	177.0 / 287
DUN 43 AB (π Pup)	07h 18m 46.6s	–37° 10' 59"	2.89 / 7.94	66.5 / 213
SMY 1 AB (ζ CMa)	06h 22m 05.0s	–30° 05' 13"	2.96 / 7.81	169.6 / 340
H 6 40 AB (γ Lep)	05h 46m 24.1s	–22° 25' 55"	3.64 / 6.28	95.5 / 349
DUN 65 BC	08h 10m 54.1s	–47° 28' 59"	4.14 / 7.26	60.9 / 113
HJ 3948 AD	07h 20m 36.5s	–25° 02' 30"	4.42 / 8.22	83.5 / 78
SHY 512 AD	07h 37m 14.1s	–28° 28' 25"	4.62 / 7.88	530.5 / 209
JC 10 AB (v1 Pup)	07h 19m 56.2s	–36° 49' 14"	4.66 / 5.07	241.6 / 102
HJ 3945 AB (145 CMa)	07h 18m 33.4s	–23° 24' 02"	5.00 / 5.84	26.5 / 50
DUN 67 (OS Pup)	08h 15m 41.8s	–36° 27' 52"	5.03 / 5.99	66.8 / 176
DUN 31 (Y Pup)	06h 39m 51.6s	–48° 15' 50"	5.14 / 7.38	12.9 / 321
DUN 47 A,CD	07h 26m 29.9s	–31° 54' 08"	5.40 / 7.58	97.1 / 344
DUN 21 AD	05h 31m 24.9s	–47° 02' 43"	5.52 / 6.68	198.3 / 272
DUN 18 AB (ι Pic)	04h 51m 57.3s	–53° 23' 10"	5.61 / 6.24	12.8 / 59
DUN 38 AB	07h 05m 22.2s	–43° 40' 46"	5.61 / 6.68	21.2 / 125
HJ 3869	06h 34m 22.4s	–32° 04' 04"	5.68 / 7.87	24.7 / 258
DUN 28 AC	06h 25m 36.9s	–36° 44' 08"	5.73 / 6.91	63.5 / 75
H 5 108 A,BC (HZ CMa)	06h 52m 07.4s	–31° 45' 46"	5.76 / 7.71	42.7 / 66
SHJ 73 (ν_1 CMa)	06h 38m 23.9s	–18° 42' 06"	5.79 / 7.38	17.4 / 265
SRT 2	04h 13m 37.2s	–20° 14' 26"	5.82 / 7.68	61.8 / 334
HJ 3759	05h 27m 59.7s	–19° 39' 31"	5.87 / 7.30	26.6 / 318
DUN 30 AB,CD	06h 30m 57.2s	–50° 16' 23"	5.97 / 7.98	11.7 / 312
HJ 3834 AE	06h 05m 59.8s	–45° 05' 05"	6.02 / 6.39	196.1 / 321
SKF 949	03h 54m 58.6s	–46° 45' 36"	6.06 / 8.47	76.4 / 3
HJ 3644 AB,D	04h 23m 25.5s	–25° 37' 21"	6.15 / 8.23	43.7 / 41
SHY 462 AB	04h 19m 48.2s	–52° 45' 04"	6.16 / 7.80	270.4 / 236
DUN 59	08h 00m 29.9s	–50° 06' 17"	6.23 / 6.24	16.3 / 48

Main variable stars

Name	RA (J2023)	DEC	Magnitude	Maximum / Period (d)	Type
L2 Pup	07h 14m 14.5s	–44° 40' 42"	2.6 / 6.2	140.6	P - Semi-irr
R CMa	07h 20m 30.7s	–16° 26' 24"	5.70 / 6.34	1.14	Ecl - Algol
S Lep	06h 06m 42.5s	–24° 11' 57"	6.0 / 7.58	89.0	P - Semi-irr

Navigation map

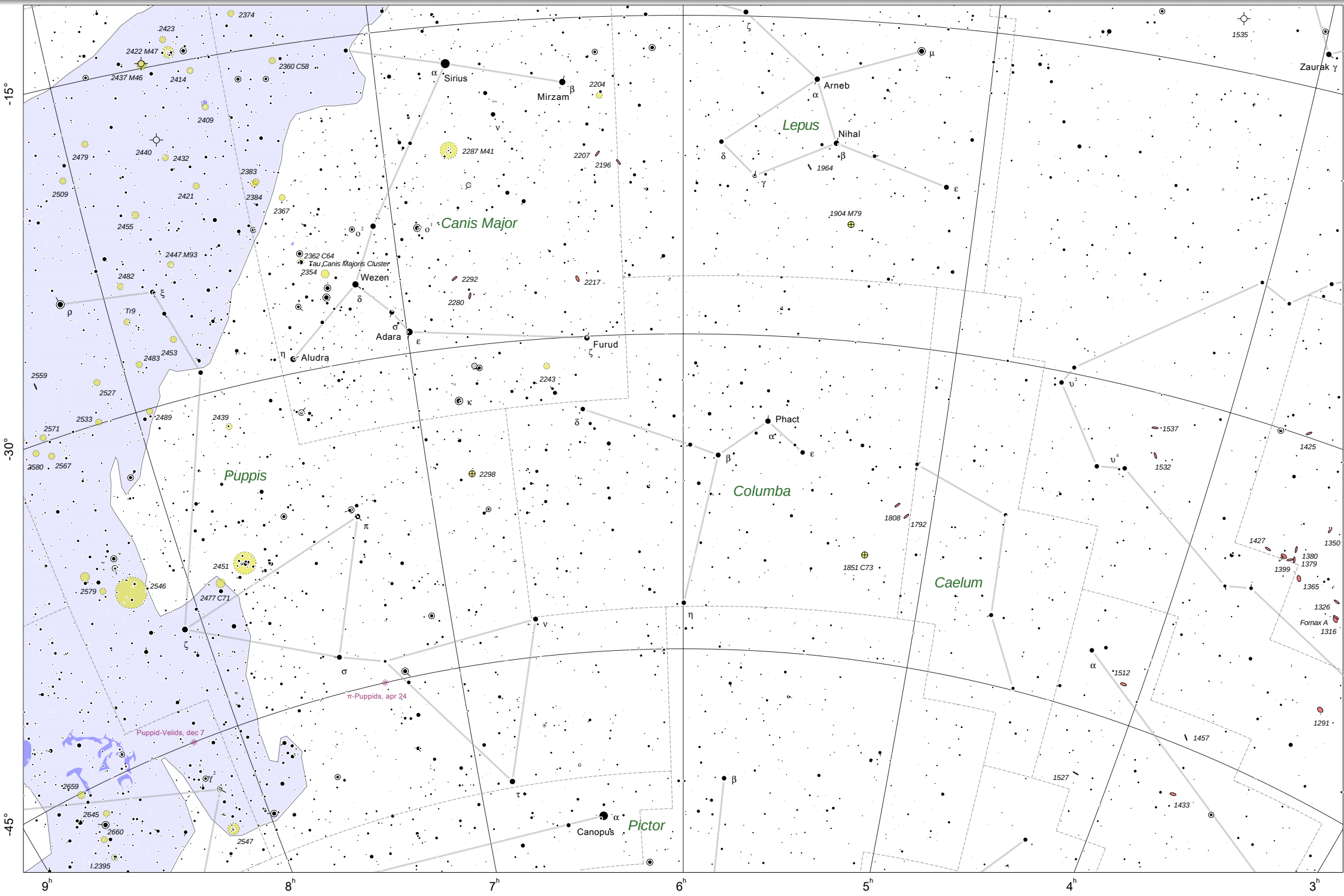


Stellar magnitudes: -1 0 1 2 3 4 5 6 7 8

Types of stars: Double, Variable

Symbols for deep sky objects (star cluster, nebula, galaxy) and constellation figure/boundary: Open cluster, Globular, Nebulose, Milky Way, Plan.neb., Galaxy, Constellation, Const. limit, Meteors

Chart 19, 30º around 6.0h, -35.0º (Columba, Canis Major, Puppis, Lepus)



Main objects visible on chart 20

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
IC2391 CALDWELL 85 - Omicron Velorum cluster	08h 40m 57.6s	–52° 59' 57"	2.6	Open cluster	60.0
NGC2451	07h 46m 13.3s	–38° 00' 25"	2.8	Open cluster	50.0
IC2395	08h 43m 14.7s	–48° 11' 31"	4.6	Open cluster	13.0
NGC2547	08h 10m 49.7s	–49° 17' 39"	4.7	Open cluster	25.0
NGC2477 CALDWELL 71	07h 52m 59.1s	–38° 35' 25"	5.8	Open cluster	20.0
NGC3228	10h 22m 16.5s	–51° 50' 41"	6.0	Open cluster	5.0
NGC2669	08h 46m 59.3s	–53° 01' 12"	6.1	Open cluster	14.0
NGC2447 M93	07h 45m 28.5s	–23° 54' 48"	6.2	Open cluster	10.0
NGC2546	08h 13m 14.9s	–37° 41' 12"	6.3	Open cluster	70.0
NGC2527	08h 05m 54.8s	–28° 12' 46"	6.5	Open cluster	10.0
NGC2539	08h 11m 41.7s	–12° 53' 24"	6.5	Open cluster	15.0
NGC2439	07h 41m 39.0s	–31° 44' 50"	6.9	Open cluster	9.0
NGC3201 CALDWELL 79	10h 18m 33.6s	–46° 31' 34"	6.9	Globular cluster	20.0
NGC2571	08h 19m 52.6s	–29° 49' 20"	7.0	Open cluster	7.0
NGC2645	08h 39m 49.2s	–46° 18' 33"	7.0	Open cluster	3.0
NGC2910	09h 31m 15.1s	–53° 00' 57"	7.2	Open cluster	6.0
NGC2482	07h 56m 10.6s	–24° 19' 13"	7.3	Open cluster	10.0
NGC2567	08h 19m 27.7s	–30° 42' 47"	7.4	Open cluster	11.0
NGC3330	10h 39m 42.0s	–54° 14' 07"	7.4	Open cluster	6.0
NGC2579	08h 21m 45.0s	–36° 17' 25"	7.5	Open cluster	19.0
NGC2483	07h 56m 35.5s	–27° 57' 26"	7.6	Open cluster	9.0
NGC2533	08h 07m 59.7s	–29° 56' 03"	7.6	Open cluster	6.0
NGC3680	11h 26m 44.5s	–43° 22' 36"	7.6	Open cluster	7.0
NGC3242 CALDWELL 59 - Ghost of Jupiter	10h 25m 52.6s	–18° 45' 33"	7.7	Planetary nebula	1.1
NGC2670	08h 46m 14.4s	–48° 52' 35"	7.8	Open cluster	7.0
NGC2489	07h 57m 11.1s	–30° 07' 36"	7.9	Open cluster	5.0
Mel96	09h 17m 05.8s	–36° 43' 23"	8.2	Open cluster	8.0
NGC2453	07h 48m 30.7s	–27° 15' 10"	8.3	Open cluster	4.0
NGC2925	09h 33m 56.9s	–53° 29' 55"	8.3	Open cluster	15.0
NGC2627	08h 38m 12.0s	–30° 02' 11"	8.4	Open cluster	9.0
NGC2659	08h 43m 23.4s	–45° 05' 01"	8.6	Open cluster	15.0
NGC2660	08h 43m 23.6s	–47° 17' 03"	8.8	Open cluster	3.0
Tr9	07h 56m 39.7s	–25° 56' 44"	9.1	Open cluster	7.0
NGC2587	08h 24m 20.6s	–29° 35' 02"	9.2	Open cluster	10.0
NGC2658	08h 44m 23.1s	–32° 44' 24"	9.2	Open cluster	10.0
NGC3132 CALDWELL 74 - Eight-burst planetary	10h 08m 00.2s	–40° 32' 57"	9.2	Planetary nebula	1.5
NGC2509	08h 01m 49.4s	–19° 06' 55"	9.3	Open cluster	12.0
NGC2997	09h 46m 39.0s	–31° 17' 51"	9.5	Galaxy	8.9 x 6.8
NGC2479	07h 56m 08.1s	–17° 46' 11"	9.6	Open cluster	11.0
NGC2580	08h 22m 24.1s	–30° 21' 58"	9.7	Open cluster	8.0
NGC3105	10h 01m 28.6s	–54° 53' 55"	9.7	Open cluster	2.0
NGC3621	11h 19m 23.0s	–32° 56' 14"	9.7	Galaxy	12.3 x 6.8
NGC3923	11h 52m 11.7s	–28° 56' 02"	9.8	Galaxy	5.9 x 3.9
NGC2972	09h 41m 01.0s	–50° 25' 31"	9.9	Open cluster	5.0
NGC3109	10h 04m 10.0s	–26° 16' 13"	9.9	Galaxy	19.1 x 3.7
NGC3585	11h 14m 24.9s	–26° 52' 50"	9.9	Galaxy	4.6 x 2.5
NGC2866	09h 22m 53.0s	–51° 12' 04"	10.0	Open cluster	20.0
NGC3446	10h 53m 13.8s	–45° 16' 57"	10.0	Open cluster	6.5
NGC3909	11h 50m 39.2s	–48° 23' 35"	10.0	Open cluster	20.0
NGC2455	07h 50m 00.1s	–21° 21' 38"	10.2	Open cluster	15.0
NGC2784	09h 13m 20.9s	–24° 16' 05"	10.2	Galaxy	5.5 x 2.2
NGC2613	08h 34m 23.3s	–23° 03' 09"	10.3	Galaxy	6.5 x 1.4
NGC4038 CALDWELL 60 - Antennae	12h 03m 03.6s	–18° 59' 33"	10.3	Galaxy	3.4 x 1.7
NGC4039 CALDWELL 61	12h 03m 04.6s	–19° 00' 49"	10.3	Galaxy	3.3 x 1.7
NGC3557	11h 11m 03.1s	–37° 39' 52"	10.4	Galaxy	4.0 x 3.0
NGC2835	09h 18m 55.1s	–22° 27' 10"	10.5	Galaxy	6.6 x 4.4
NGC3087	10h 00m 08.8s	–34° 20' 11"	10.5	Galaxy	2.0
NGC2663	08h 46m 03.6s	–33° 52' 47"	10.6	Galaxy	3.5 x 2.4
NGC3887	11h 48m 14.8s	–16° 58' 54"	10.6	Galaxy	3.5 x 2.7
NGC2568	08h 19m 09.7s	–37° 10' 41"	10.7	Open cluster	3.0
NGC3962	11h 55m 50.4s	–14° 06' 10"	10.7	Galaxy	2.6 x 2.2
NGC4105	12h 07m 51.9s	–29° 53' 17"	10.7	Galaxy	2.8 x 2.1
NGC2986	09h 45m 20.0s	–21° 23' 04"	10.8	Galaxy	3.2 x 2.6
NGC2559	08h 18m 03.6s	–27° 31' 45"	10.9	Galaxy	3.0 x 1.4
NGC3885	11h 47m 56.3s	–28° 03' 00"	10.9	Galaxy	2.4 x 1.0
NGC3904	11h 50m 23.2s	–29° 24' 17"	10.9	Galaxy	2.7 x 2.0
NGC4373	12h 26m 31.3s	–39° 53' 16"	10.9	Galaxy	3.6 x 2.6
NGC2566	08h 19m 44.2s	–25° 34' 25"	11.0	Galaxy	2.9 x 1.7
NGC3223	10h 22m 36.8s	–34° 23' 01"	11.0	Galaxy	4.1 x 2.7
NGC3224	10h 22m 43.0s	–34° 48' 46"	11.0	Galaxy	1.9 x 1.5

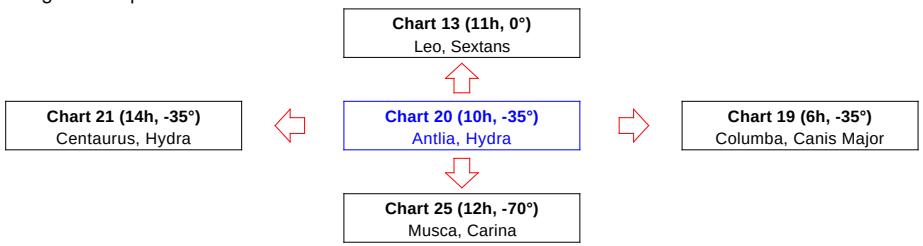
Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
DUN 65 AB (Suhail al muhlif)	08h 10m 57.1s	–47° 28' 28"	1.79 / 4.14	41.2 / 221
DUN 65 AC	08h 10m 57.1s	–47° 28' 28"	1.79 / 7.26	61.5 / 152
JC 2 AB (δ Cen)	12h 10m 46.6s	–50° 58' 42"	2.51 / 4.42	269.1 / 325
JC 2 AC	12h 10m 46.6s	–50° 58' 42"	2.51 / 6.35	216.9 / 227
WFC 73 (α Pyx)	08h 45m 27.1s	–33° 21' 17"	3.63 / 8.14	106.5 / 356
DUN 65 BC	08h 10m 54.1s	–47° 28' 59"	4.14 / 7.26	60.9 / 113
BSO 18 A,BC (HY Vel)	08h 43m 44.2s	–53° 16' 52"	4.79 / 5.45	76.3 / 311
LDS 6238 AC	11h 07m 34.1s	–27° 32' 34"	4.96 / 6.10	18.0 / 46
TOB 374 AD	11h 07m 34.1s	–27° 32' 34"	4.96 / 5.70	507.3 / 88
DUN 67 (OS Pup)	08h 15m 41.8s	–36° 27' 52"	5.03 / 5.99	66.8 / 176
BSO 6	11h 30m 49.0s	–42° 55' 41"	5.13 / 7.38	13.9 / 164
HJ 4465 AC	11h 44m 02.5s	–32° 45' 17"	5.37 / 8.34	66.1 / 44
S 568	08h 27m 03.3s	–24° 11' 55"	5.48 / 8.43	42.7 / 90
PZ 3 (s Vel)	10h 33m 55.5s	–45° 18' 16"	5.64 / 5.97	13.2 / 218
S 585	08h 57m 18.8s	–18° 25' 09"	5.90 / 7.24	64.2 / 151
SHJ 110 AC	10h 06m 14.7s	–18° 19' 34"	6.22 / 6.97	21.2 / 274
DUN 59	08h 00m 29.9s	–50° 06' 17"	6.23 / 6.24	16.3 / 48
HJ 4046 AB	08h 07m 31.6s	–33° 42' 14"	6.26 / 8.44	21.9 / 88
DUN 55 AB	07h 45m 27.5s	–50° 34' 13"	6.64 / 7.59	52.0 / 133
STF 1474 AB	10h 49m 54.3s	–15° 30' 21"	6.66 / 7.00	65.9 / 28
STF 1474 AC	10h 49m 54.3s	–15° 30' 21"	6.66 / 7.59	72.6 / 27
DUN 114	11h 42m 15.5s	–38° 21' 49"	6.74 / 8.04	17.1 / 95
DUN 56	07h 48m 39.9s	–41° 37' 11"	6.89 / 7.84	49.3 / 177
DUN 72 A,BC	08h 41m 59.5s	–42° 33' 17"	6.91 / 7.80	130.2 / 1
DUN 113	11h 39m 14.7s	–39° 12' 52"	6.94 / 7.62	149.8 / 149

Main variable stars

Name	RA (J2023)	DEC	Magnitude	Max/Per (d)	Type
V Hya	10h 52m 44.5s	–21° 22' 21"	10.9 / 16	530.7	P - Semi-irr

Navigation map

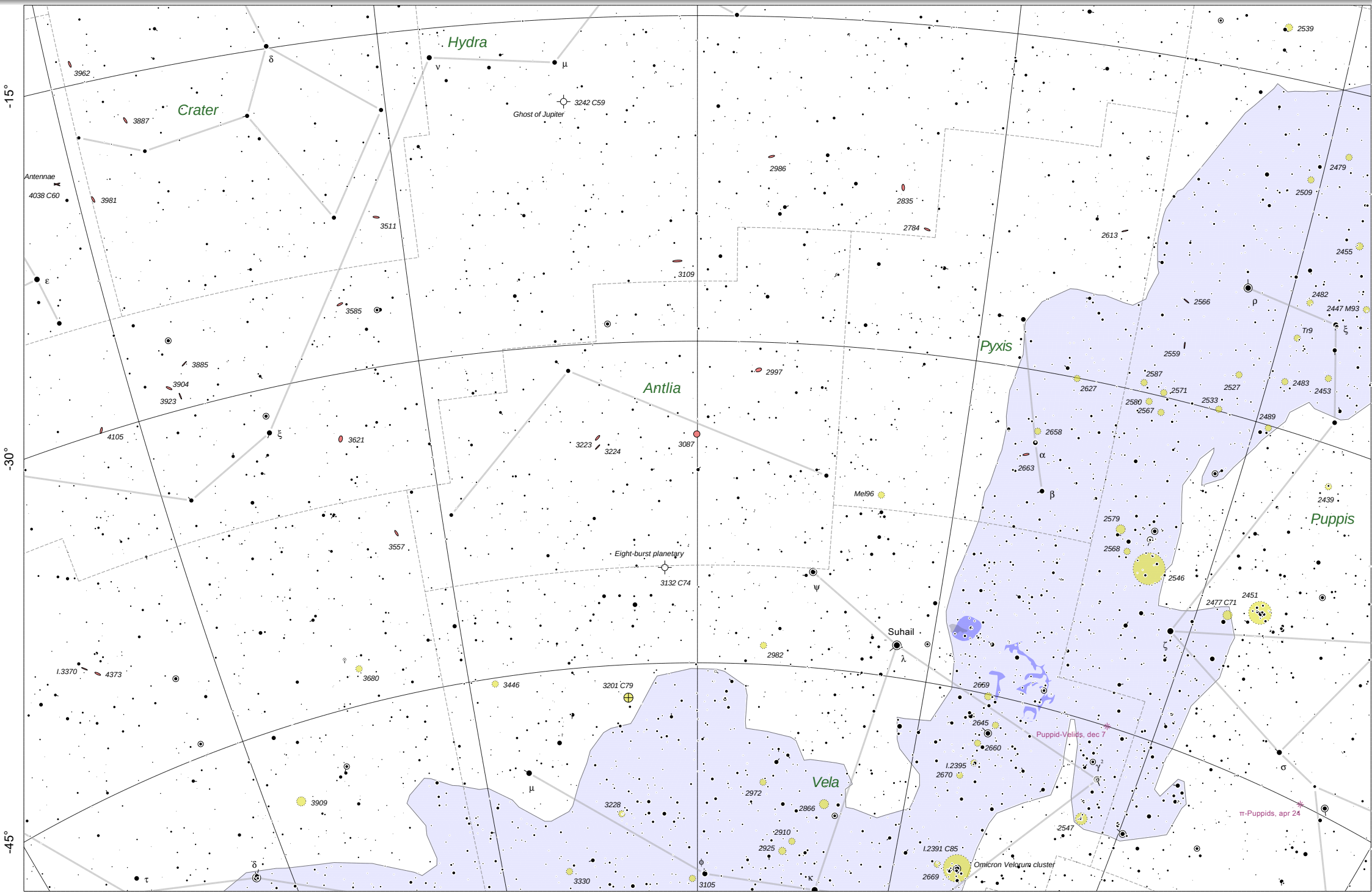


Stellar magnitudes: -1 0 1 2 3 4 5 6 7 8

Types of stars: Double, Variable

Symbols for deep sky objects (star cluster, nebula, galaxy) and constellation figure/boundary: Open cluster, Globular, Nebulose, Milky Way, Plan.neb., Galaxy, Constellation, Const. limit, Meteors

Chart 20, 30º around 10.0h, -35.0º (Antlia, Hydra, Pyxis, Vela)



Main objects visible on chart 21

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
NGC6193 CALDWELL 82	16h 43m 04.1s	–48° 48' 21"	5.2	Open cluster	14.0
NGC5139 CALDWELL 80 - Omega Centauri	13h 28m 10.2s	–47° 35' 59"	5.3	Globular cluster	55.0
NGC5460	14h 09m 05.1s	–48° 24' 31"	5.6	Open cluster	35.0
NGC6124 CALDWELL 75	16h 26m 52.2s	–40° 43' 05"	5.8	Open cluster	40.0
NGC6250	16h 59m 37.4s	–45° 58' 14"	5.9	Open cluster	16.0
NGC5822	15h 05m 44.0s	–54° 25' 40"	6.5	Open cluster	35.0
NGC6169	16h 35m 43.4s	–44° 05' 30"	6.6	Open cluster	12.0
NGC5128 CALDWELL 77 - Centaurus A	13h 26m 50.3s	–43° 08' 07"	6.8	Galaxy	25.7 x 20.0
NGC6134	16h 29m 27.1s	–49° 12' 50"	7.2	Open cluster	6.0
NGC6178	16h 37m 30.9s	–45° 41' 32"	7.2	Open cluster	5.0
NGC4590 M68	12h 40m 41.4s	–26° 52' 06"	7.3	Globular cluster	11.0
NGC5286 CALDWELL 84	13h 47m 54.6s	–51° 29' 13"	7.4	Globular cluster	11.0
NGC6200	16h 45m 51.1s	–47° 30' 39"	7.4	Open cluster	15.0
NGC5236 M83	13h 38m 18.2s	–29° 59' 02"	7.5	Galaxy	12.9 x 11.5
NGC3680	11h 26m 44.5s	–43° 22' 36"	7.6	Open cluster	7.0
NGC5986	15h 47m 34.2s	–37° 51' 21"	7.6	Globular cluster	9.6
NGC5927	15h 29m 40.9s	–50° 45' 02"	8.0	Globular cluster	6.0
Hogg18	14h 52m 19.8s	–52° 21' 38"	8.0	Open cluster	3.0
NGC6204	16h 47m 50.0s	–47° 03' 08"	8.2	Open cluster	6.0
NGC4945 CALDWELL 83	13h 06m 47.1s	–49° 35' 08"	8.4	Galaxy	19.8 x 4.0
NGC5897	15h 18m 44.2s	–21° 05' 34"	8.4	Globular cluster	11.0
NGC5946	15h 37m 09.6s	–50° 44' 02"	8.4	Globular cluster	3.0
NGC6192	16h 41m 58.9s	–43° 24' 30"	8.5	Open cluster	9.0
NGC5749	14h 50m 28.6s	–54° 35' 17"	8.8	Open cluster	10.0
NGC5834	15h 05m 23.7s	–33° 09' 21"	9.1	Globular cluster	7.4
NGC6139	16h 29m 13.9s	–38° 53' 53"	9.1	Globular cluster	8.2
NGC5882	15h 18m 24.6s	–45° 43' 56"	9.4	Planetary nebula	19.8"
NGC5102	13h 23m 15.8s	–36° 45' 05"	9.6	Galaxy	8.6 x 2.7
NGC3923	11h 52m 11.7s	–28° 56' 02"	9.8	Galaxy	5.9 x 3.9
NGC4976	13h 09m 58.9s	–49° 37' 41"	10.0	Galaxy	5.6 x 3.0
NGC5068	13h 20m 09.3s	–21° 09' 30"	10.0	Galaxy	7.3 x 6.4
NGC5247	13h 39m 17.8s	–18° 00' 04"	10.0	Galaxy	5.4 x 4.9
NGC5643	14h 34m 10.0s	–44° 16' 29"	10.0	Galaxy	4.7 x 4.2
NGC3909	11h 50m 39.2s	–48° 23' 35"	10.0	Open cluster	20.0
NGC6216	16h 51m 03.3s	–44° 46' 11"	10.1	Open cluster	4.0
NGC5694 CALDWELL 66	14h 40m 57.1s	–26° 38' 09"	10.2	Globular cluster	4.3
IC4406	14h 23m 54.6s	–44° 15' 16"	10.2	Planetary nebula	1.8
NGC4038 CALDWELL 60 - Antennae	12h 03m 03.6s	–18° 59' 33"	10.3	Galaxy	3.4 x 1.7
NGC4039 CALDWELL 61	12h 03m 04.6s	–19° 00' 49"	10.3	Galaxy	3.3 x 1.7
NGC4696	12h 50m 05.6s	–41° 26' 12"	10.4	Galaxy	4.7 x 3.3
NGC5061	13h 19m 21.2s	–26° 57' 28"	10.4	Galaxy	3.5 x 3.0
NGC5253	13h 41m 14.6s	–31° 45' 27"	10.4	Galaxy	5.0 x 1.9
NGC4856	13h 00m 34.0s	–15° 09' 57"	10.5	Galaxy	4.3 x 1.2
NGC5084	13h 21m 31.7s	–21° 56' 52"	10.5	Galaxy	9.3 x 1.7
NGC5121	13h 26m 04.8s	–37° 48' 06"	10.6	Galaxy	1.9 x 1.5
IC4296	13h 37m 58.1s	–34° 04' 57"	10.6	Galaxy	2.8
NGC3962	11h 55m 50.4s	–14° 06' 10"	10.7	Galaxy	2.6 x 2.2
NGC4105	12h 07m 51.9s	–29° 53' 17"	10.7	Galaxy	2.8 x 2.1
NGC4936	13h 05m 32.8s	–30° 38' 59"	10.7	Galaxy	2.7 x 2.3
NGC5101	13h 23m 02.4s	–27° 33' 02"	10.7	Galaxy	5.4 x 4.6
NGC5333	13h 55m 51.6s	–48° 37' 30"	10.7	Galaxy	1.9 x 1.0
NGC5018	13h 14m 15.1s	–19° 38' 27"	10.8	Galaxy	3.4 x 2.6
NGC5044	13h 16m 37.6s	–16° 30' 20"	10.8	Galaxy	3.0
NGC5419	14h 05m 00.1s	–34° 05' 17"	10.8	Galaxy	4.1 x 3.3
NGC3885	11h 47m 56.3s	–28° 03' 00"	10.9	Galaxy	2.4 x 1.0
NGC3904	11h 50m 23.2s	–29° 24' 17"	10.9	Galaxy	2.7 x 2.0
NGC4361	12h 25m 42.7s	–18° 54' 41"	10.9	Planetary nebula	2.1
NGC4373	12h 26m 31.3s	–39° 53' 16"	10.9	Galaxy	3.6 x 2.6
NGC4709	12h 51m 20.6s	–41° 30' 27"	10.9	Galaxy	2.3 x 2.0
NGC4902	13h 02m 12.4s	–14° 38' 14"	10.9	Galaxy	2.9 x 2.6
NGC5054	13h 18m 12.1s	–16° 45' 20"	10.9	Galaxy	5.1 x 2.8
NGC5206	13h 35m 08.3s	–48° 16' 09"	10.9	Galaxy	3.8 x 3.3
NGC6153	16h 33m 05.5s	–40° 18' 03"	10.9	Planetary nebula	24.0"
IC3896	12h 58m 02.7s	–50° 28' 17"	10.9	Galaxy	2.5 x 1.8
NGC3981	11h 57m 17.6s	–20° 01' 31"	11.0	Galaxy	5.3 x 2.5
NGC5078	13h 21m 06.0s	–27° 31' 48"	11.0	Galaxy	4.0 x 1.9
NGC5873	15h 14m 19.5s	–38° 12' 37"	11.0	Planetary nebula	13.2"
IC3370	12h 28m 51.0s	–39° 27' 53"	11.0	Galaxy	2.1 x 1.6

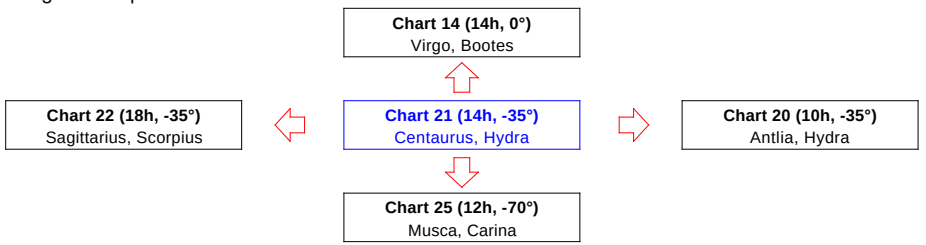
Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
JC 2 AB (δ Cen)	12h 10m 46.6s	–50° 58' 42"	2.51 / 4.42	269.1 / 325
JC 2 AC	12h 10m 46.6s	–50° 58' 42"	2.51 / 6.35	216.9 / 227
SHJ 186 AB (α_2 Lib)	14h 53m 26.6s	–16° 13' 44"	2.74 / 5.19	231.1 / 314
SHJ 145 AB (Algorab)	12h 32m 15.9s	–16° 46' 09"	2.95 / 8.47	24.2 / 216
RMK 21 AB (η Lup)	16h 03m 10.9s	–38° 31' 23"	3.37 / 7.50	15.0 / 19
DUN 176 (ζ Lup)	15h 15m 37.8s	–52° 16' 08"	3.50 / 6.74	71.6 / 249
DUN 177 (κ_1 Lup)	15h 15m 10.0s	–48° 54' 28"	3.83 / 5.52	26.3 / 143
WFC 145 AB (χ Cen)	14h 08m 52.9s	–41° 23' 49"	4.31 / 8.49	85.2 / 78
HJ 4853 (ϵ Nor)	16h 30m 34.5s	–47° 39' 14"	4.51 / 6.12	22.9 / 334
DUN 180 AC	15h 21m 45.7s	–48° 02' 23"	4.93 / 6.34	23.2 / 128
DUN 180 BC	15h 21m 45.7s	–48° 02' 22"	4.99 / 6.34	24.1 / 129
PZ 4 (ξ_1 Lup)	15h 59m 50.2s	–34° 05' 45"	5.09 / 5.56	10.3 / 50
BSO 6	11h 30m 49.0s	–42° 55' 41"	5.13 / 7.38	13.9 / 164
BU 1245 A,CD	12h 22m 57.8s	–22° 28' 15"	5.17 / 6.04	347.8 / 295
RMK 18 (N Cen)	13h 55m 05.1s	–53° 02' 13"	5.24 / 7.50	18.5 / 289
HJ 4465 AC	11h 44m 02.5s	–32° 45' 17"	5.37 / 8.34	66.1 / 44
HJ 4690 AB (a Lup)	14h 40m 22.4s	–46° 19' 49"	5.55 / 7.65	19.6 / 24
BSO 12 AB	16h 22m 27.9s	–31° 00' 50"	5.55 / 6.88	23.6 / 318
H N 69 AB	13h 39m 23.2s	–26° 43' 42"	5.74 / 6.60	10.2 / 190
H N 28 AB (H N 28AB)	15h 00m 06.5s	–21° 35' 51"	5.88 / 8.18	26.0 / 307
DUN 178 AC	15h 14m 42.9s	–45° 26' 52"	6.53 / 7.31	30.6 / 256
SHJ 179 AB	14h 28m 04.9s	–20° 10' 31"	6.61 / 7.16	35.0 / 296
DUN 199 AC	16h 11m 40.9s	–39° 12' 39"	6.62 / 7.13	44.4 / 184
DUN 114	11h 42m 15.5s	–38° 21' 49"	6.74 / 8.04	17.1 / 95
SHJ 195	15h 17m 05.0s	–18° 35' 48"	6.79 / 8.32	47.5 / 141
DUN 195 AB	15h 58m 15.2s	–50° 28' 11"	6.81 / 7.46	12.1 / 9
DUN 192 AB,C	15h 50m 02.4s	–35° 38' 57"	6.91 / 7.26	34.6 / 143
DUN 113	11h 39m 14.7s	–39° 12' 52"	6.94 / 7.62	149.8 / 149
DUN 146	13h 52m 01.9s	–40° 44' 35"	6.95 / 7.45	68.5 / 87

Main variable stars

Name	RA (J2023)	DEC	Magnitude	Max/Per (d)	Type
R Hya	13h 30m 58.5s	–23° 23' 58"	3.5 / 10.9	Sep 1 / 389	P - Mira
RS Lib	15h 25m 40.7s	–22° 59' 29"	7.0 / 13.0	Mar 27, Oct 31 / 218	P - Mira

Navigation map

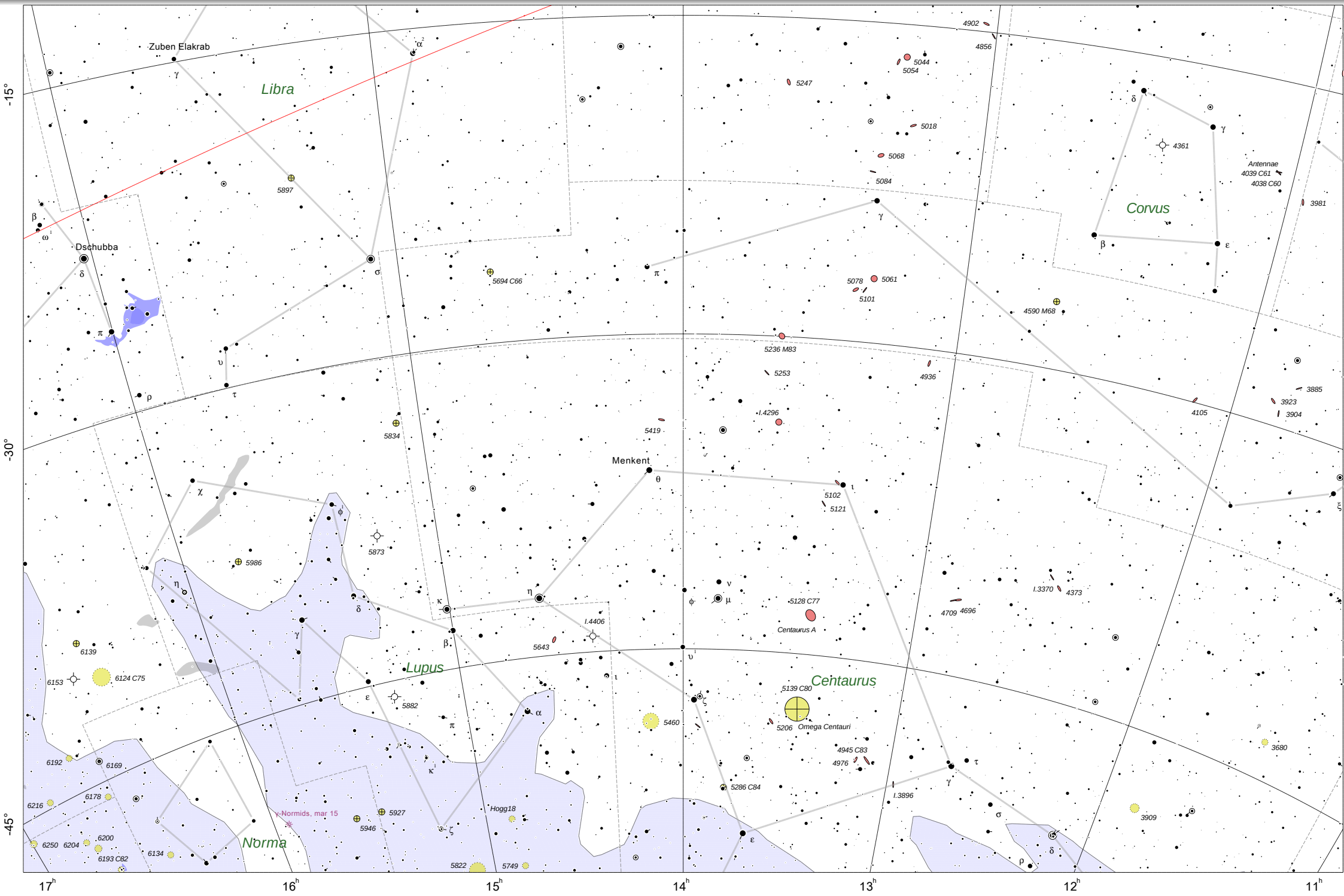


Stellar magnitudes: -1 0 1 2 3 4 5 6 7 8

Types of stars: Double Variable

Symbols for deep sky objects (star cluster, nebula, galaxy) and constellation figure/boundary: Open cluster Globular Nebulose Milky Way Plan.neb. Galaxy Constellation Const. limit Meteors

Chart 21, 30º around 14.0h, -35.0º (Centaurus, Hydra, Lupus, Libra)



Main objects visible on chart 22. Objects and stars close to the edges are listed in their neighboring charts

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
NGC6729 CALDWELL 68	19h 03m 28.3s	–36° 55' 23"		Nebula	25.0 x 20.0
NGC6231 CALDWELL 76	16h 55m 46.9s	–41° 51' 39"	2.6	Open cluster	14.0
NGC6475 M7 - Ptolemy's cluster	17h 55m 22.1s	–34° 47' 47"	3.3	Open cluster	75.0
NGC6405 M6	17h 41m 50.1s	–32° 16' 08"	4.2	Open cluster	33.0
NGC6523 M8 - Lagoon nebula	18h 05m 06.7s	–24° 22' 39"	4.6	Nebula	45.0 x 30.0
NGC6530	18h 05m 54.6s	–24° 21' 20"	4.6	Open cluster	15.0
IC4725 M25	18h 33m 06.3s	–19° 06' 07"	4.6	Open cluster	26.0
IC4715 M24 - Sagittarius Star Cloud	18h 20m 09.0s	–18° 32' 21"	5.0	Open cluster	1.50°
NGC6193 CALDWELL 82	16h 43m 04.1s	–48° 48' 21"	5.2	Open cluster	14.0
NGC6656 M22	18h 37m 48.4s	–23° 52' 56"	5.2	Globular cluster	32.0
NGC6121 M4	16h 25m 00.3s	–26° 34' 36"	5.4	Globular cluster	36.0
NGC6281	17h 06m 21.2s	–37° 55' 04"	5.4	Open cluster	8.0
NGC6383	17h 36m 12.5s	–32° 35' 43"	5.5	Open cluster	20.0
NGC6494 M23	17h 58m 17.3s	–19° 00' 47"	5.5	Open cluster	25.0
NGC6416	17h 45m 50.1s	–32° 22' 10"	5.7	Open cluster	15.0
NGC6124 CALDWELL 75	16h 26m 52.2s	–40° 43' 05"	5.8	Open cluster	40.0
NGC6250	16h 59m 37.4s	–45° 58' 14"	5.9	Open cluster	16.0
NGC6531 M21	18h 05m 36.8s	–22° 29' 50"	5.9	Open cluster	16.0
NGC6322	17h 20m 04.6s	–42° 57' 24"	6.0	Open cluster	5.0
NGC6514 M20 - Trifid nebula	18h 04m 05.7s	–22° 58' 11"	6.3	Nebula	20.0
NGC6541 CALDWELL 78	18h 09m 42.3s	–43° 42' 22"	6.3	Globular cluster	15.0
NGC6809 M55	19h 41m 26.8s	–30° 54' 26"	6.3	Globular cluster	19.0
NGC6242	16h 57m 05.7s	–39° 30' 07"	6.4	Open cluster	9.0
NGC6266 M62	17h 02m 40.6s	–30° 08' 38"	6.4	Globular cluster	15.0
Cr367	18h 11m 24.4s	–23° 59' 38"	6.5	Open cluster	50.0 x 30.0
NGC6169	16h 35m 43.4s	–44° 05' 30"	6.6	Open cluster	12.0
NGC6167	16h 36m 19.5s	–49° 49' 05"	6.7	Open cluster	7.0
NGC6273 M19	17h 04m 03.1s	–26° 17' 56"	6.8	Globular cluster	17.0
NGC6388	17h 37m 58.0s	–44° 44' 50"	6.8	Globular cluster	10.4
NGC6723	19h 01m 06.0s	–36° 35' 52"	6.8	Globular cluster	13.0
NGC6626 M28	18h 25m 57.8s	–24° 51' 19"	6.9	Globular cluster	13.8
IC4651	17h 26m 38.9s	–49° 57' 45"	6.9	Open cluster	10.0
NGC6134	16h 29m 27.1s	–49° 12' 50"	7.2	Open cluster	6.0
NGC6178	16h 37m 30.9s	–45° 41' 32"	7.2	Open cluster	5.0
NGC6425	17h 48m 29.6s	–31° 32' 13"	7.2	Open cluster	10.0
NGC6441	17h 51m 46.8s	–37° 03' 20"	7.2	Globular cluster	9.6
NGC6093 M80	16h 18m 25.0s	–23° 01' 47"	7.3	Globular cluster	10.0
NGC6200	16h 45m 51.1s	–47° 30' 39"	7.4	Open cluster	15.0
NGC6401	17h 40m 01.2s	–23° 55' 12"	7.4	Globular cluster	4.8
NGC6544	18h 08m 45.6s	–24° 59' 33"	7.5	Globular cluster	9.2
NGC6716	18h 55m 55.5s	–19° 52' 40"	7.5	Open cluster	10.0
Tr29	17h 43m 06.6s	–40° 09' 36"	7.5	Open cluster	10.0
NGC6520	18h 04m 52.0s	–27° 53' 20"	7.6	Open cluster	5.0
NGC6624	18h 25m 09.1s	–30° 20' 49"	7.6	Globular cluster	8.8
NGC6715 M54	18h 56m 31.6s	–30° 26' 49"	7.7	Globular cluster	12.0
NGC6333 M9	17h 20m 32.7s	–18° 32' 17"	7.8	Globular cluster	12.0
NGC6352 CALDWELL 81	17h 27m 14.2s	–48° 26' 27"	7.8	Globular cluster	9.0
NGC6681 M70	18h 44m 42.5s	–32° 16' 01"	7.8	Globular cluster	8.0
NGC6259	17h 02m 25.4s	–44° 41' 14"	8.0	Open cluster	15.0
NGC6546	18h 08m 45.9s	–23° 17' 32"	8.0	Open cluster	15.0
NGC6316	17h 18m 04.3s	–28° 09' 47"	8.1	Globular cluster	5.4
NGC6204	16h 47m 50.0s	–47° 03' 08"	8.2	Open cluster	6.0
NGC6249	16h 59m 21.9s	–44° 50' 19"	8.2	Open cluster	6.0
NGC6451	17h 52m 09.1s	–30° 12' 59"	8.2	Open cluster	8.0
NGC6469	17h 54m 19.8s	–22° 18' 56"	8.2	Open cluster	8.0
NGC6293	17h 11m 36.2s	–26° 36' 30"	8.3	Globular cluster	8.2
NGC6304	17h 16m 00.3s	–29° 29' 11"	8.3	Globular cluster	8.0
NGC6553	18h 10m 41.2s	–25° 54' 06"	8.3	Globular cluster	9.2
NGC6637 M69	18h 32m 53.2s	–32° 19' 47"	8.3	Globular cluster	7.1
NGC6569	18h 15m 08.7s	–31° 49' 04"	8.4	Globular cluster	6.4
NGC6717	18h 56m 29.4s	–22° 40' 10"	8.4	Globular cluster	5.4
NGC6192	16h 41m 58.9s	–43° 24' 30"	8.5	Open cluster	9.0
NGC6396	17h 39m 08.4s	–35° 02' 16"	8.5	Open cluster	3.0
NGC6652	18h 37m 16.1s	–32° 58' 10"	8.5	Globular cluster	6.0
Tr24	16h 58m 36.2s	–40° 42' 04"	8.5	Open cluster	40.0
Tr33	18h 26m 03.7s	–19° 42' 09"	8.5	Open cluster	5.5
NGC6355	17h 25m 24.4s	–26° 22' 22"	8.6	Globular cluster	4.2
NGC6496	18h 00m 42.7s	–44° 15' 52"	8.6	Globular cluster	5.6
NGC6558	18h 11m 48.1s	–31° 45' 25"	8.6	Globular cluster	4.2
NGC6568	18h 14m 06.9s	–21° 34' 33"	8.6	Open cluster	12.0
NGC6400	17h 41m 45.8s	–36° 58' 20"	8.8	Open cluster	12.0

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
NGC6235	16h 54m 48.2s	–22° 12' 47"	8.9	Globular cluster	5.0
NGC6284	17h 05m 53.3s	–24° 47' 40"	8.9	Globular cluster	6.2
NGC6642	18h 33m 18.2s	–23° 27' 28"	8.9	Globular cluster	5.8
NGC6144	16h 28m 38.7s	–26° 04' 27"	9.0	Globular cluster	7.4
NGC6139	16h 29m 13.9s	–38° 53' 53"	9.1	Globular cluster	8.2
NGC6638	18h 32m 21.4s	–25° 28' 42"	9.2	Globular cluster	7.3
Tr26	17h 30m 04.0s	–29° 31' 01"	9.2	Open cluster	10.0
NGC6287	17h 06m 32.6s	–22° 44' 15"	9.3	Globular cluster	4.8
NGC6440	17h 50m 14.7s	–20° 21' 53"	9.3	Globular cluster	4.4
NGC6540	18h 07m 35.5s	–27° 45' 39"	9.3	Globular cluster	1.5
NGC6268	17h 03m 39.6s	–39° 45' 10"	9.5	Open cluster	6.0
NGC6342	17h 22m 31.7s	–19° 36' 28"	9.5	Globular cluster	4.4
NGC6302 CALDWELL 69 - Bug nebula	17h 15m 17.6s	–37° 07' 43"	9.6	Planetary nebula	1.5
NGC6528	18h 06m 18.1s	–30° 03' 08"	9.6	Globular cluster	5.0
NGC6522	18h 05m 02.6s	–30° 01' 51"	9.9	Globular cluster	9.4
NGC6583	18h 17m 12.0s	–22° 07' 42"	10.0	Open cluster	5.0
NGC6216	16h 51m 03.3s	–44° 46' 11"	10.1	Open cluster	4.0
NGC6325	17h 19m 23.2s	–23° 47' 18"	10.2	Globular cluster	4.1
NGC6453	17h 52m 23.7s	–34° 36' 10"	10.2	Globular cluster	7.6
NGC6404	17h 41m 08.1s	–33° 15' 27"	10.6	Open cluster	6.0
NGC6644	18h 33m 59.7s	–25° 06' 35"	10.7	Planetary nebula	12.0"
IC1297	19h 18m 58.1s	–39° 34' 11"	10.7	Planetary nebula	24.0"
IC4776	18h 47m 21.2s	–33° 18' 59"	10.8	Planetary nebula	18.0"
NGC6153	16h 33m 05.5s	–40° 18' 03"	10.9	Planetary nebula	24.0"

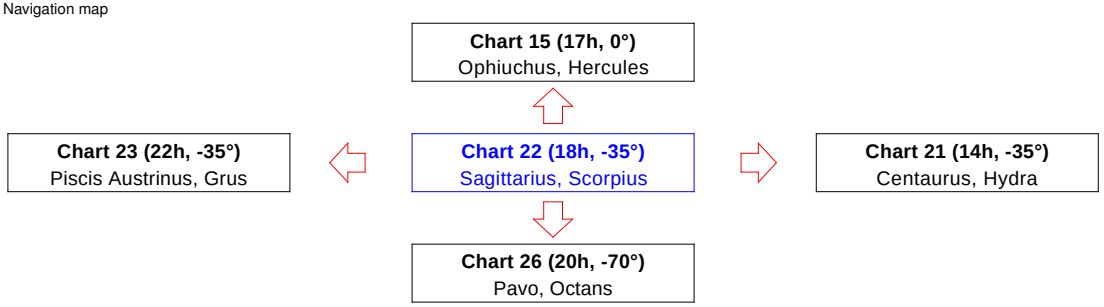
Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
H 4 121 AB (Alniyat)	16h 23m 59.3s	–25° 41' 54"	2.89 / 8.42	20.5 / 269
SKF 2608 AD	16h 54m 59.6s	–38° 07' 14"	2.97 / 3.51	346.8 / 72
DUN 226 (Arkab prior)	19h 25m 55.6s	–44° 22' 01"	3.98 / 7.21	28.4 / 76
H 2 19 AC	16h 28m 21.0s	–23° 32' 51"	5.07 / 7.29	149.2 / 0
H 2 19 AD	16h 28m 21.0s	–23° 32' 51"	5.07 / 6.81	156.4 / 252
SHJ 243 AC	17h 18m 12.7s	–26° 38' 59"	5.12 / 6.46	731.6 / 74
SHJ 243 AD	17h 18m 12.7s	–26° 38' 59"	5.12 / 7.80	276.9 / 338
SHJ 243 BD	17h 18m 12.7s	–26° 39' 03"	5.12 / 7.80	272.3 / 337
H 3 25 (o Oph)	17h 20m 49.8s	–24° 19' 55"	5.23 / 6.64	10.8 / 355
DUN 222 (κ_2 Cra)	18h 36m 33.1s	–38° 41' 14"	5.58 / 6.16	20.5 / 359
DUN 216 AC	17h 30m 16.2s	–45° 52' 41"	5.63 / 7.12	102.5 / 312
JC 23 AF	16h 57m 16.3s	–41° 52' 38"	5.65 / 6.56	56.7 / 19
DUN 206 AC	16h 44m 47.8s	–48° 50' 51"	5.71 / 6.76	10.2 / 265
DUN 219 AB	18h 02m 03.5s	–36° 51' 28"	5.84 / 7.75	54.2 / 253

Main variable stars

Name	RA (J2023)	DEC	Magnitude	Maximum / Period (d)	Type
R Sgr	19h 18m 02.7s	–19° 15' 55"	6.7 / 12.83	Mar 8, Dec 3 / 269.84	P - Mira
RR Sco	16h 58m 06.0s	–30° 36' 53"	5.0 / 12.4	Jan 27, Nov 4 / 281.45	P - Mira
R Oph	17h 09m 05.1s	–16° 07' 17"	7.0 / 13.8	Jun 11 / 306.5	P - Mira
HD 176386	19h 03m 11.9s	–36° 51' 23"	7.22 / 7.28		P
BF Oph	17h 07m 31.2s	–26° 36' 36"	6.93 / 7.71	4.07	P - δ Cep
VX Sgr	18h 09m 27.3s	–22° 13' 09"	6.5 / 14.0	732	P - Semi-irr
RS Sco	16h 57m 18.3s	–45° 08' 18"	6.2 / 13.0	Mar 8 / 319.91	P - Mira

Navigation map

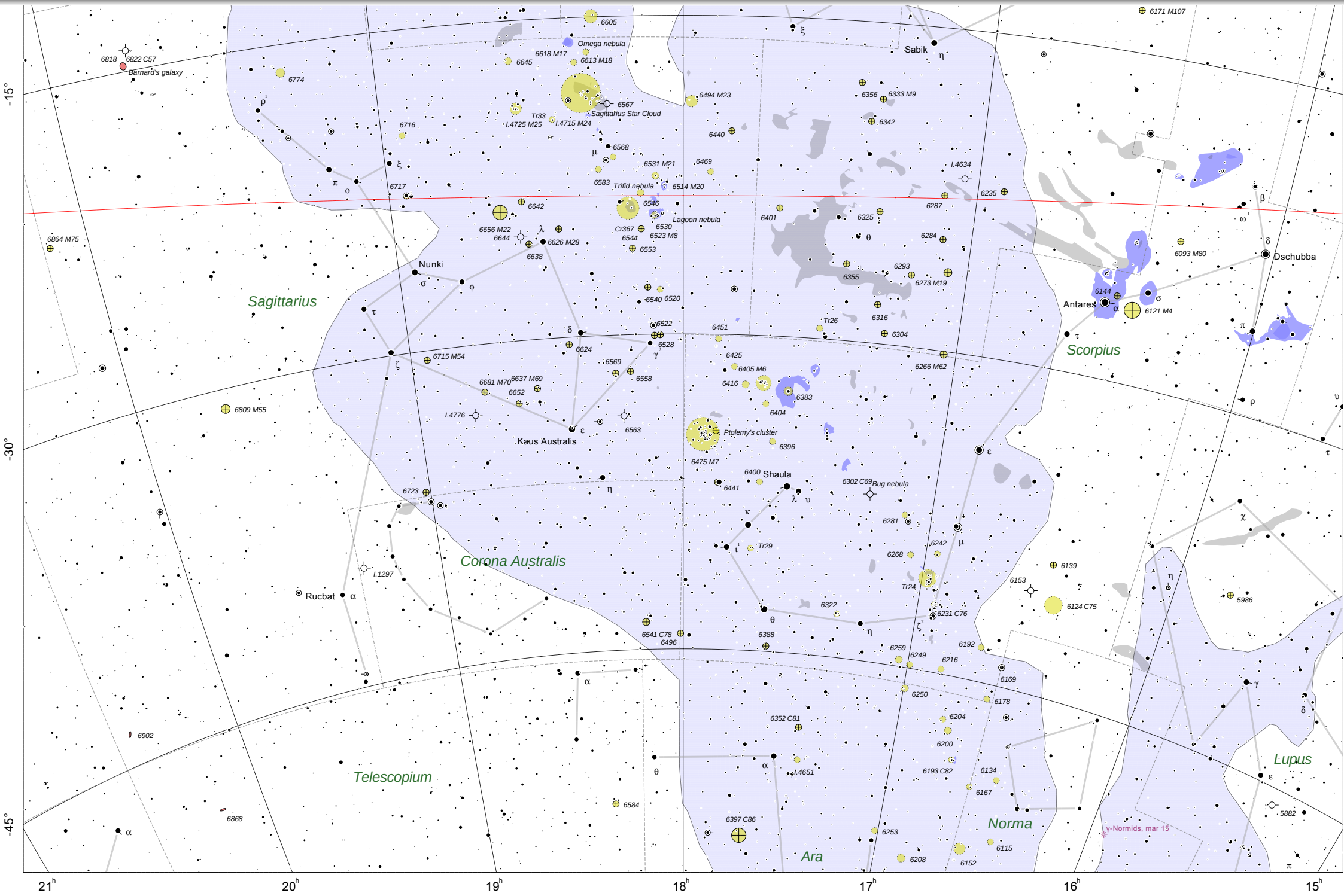


Stellar magnitudes: -1 0 1 2 3 4 5 6 7 8

Types of stars: Double Variable

Symbols for deep sky objects (star cluster, nebula, galaxy) and constellation figure/boundary: Open cluster, Globular, Nebulose, Milky Way, Plan.neb., Galaxy, Constellation, Const. limit, Meteors

Chart 22, 30º around 18.0h, -35.0º (Sagittarius, Scorpius, Corona Australis, Ophiuchus)



Main objects visible on chart 23

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
NGC6809 M55	19h 41m 26.8s	–30° 54' 26"	6.3	Globular cluster	19.0
NGC7099 M30	21h 41m 40.2s	–23° 04' 24"	6.9	Globular cluster	12.0
NGC7293 CALDWELL 63 - Helix nebula	22h 30m 53.6s	–20° 43' 05"	7.3	Planetary nebula	17.6
NGC55 CALDWELL 72	00h 16m 17.0s	–39° 05' 30"	7.9	Galaxy	31.2 x 5.9
NGC6864 M75	20h 07m 26.0s	–21° 51' 13"	8.6	Globular cluster	6.8
NGC7793	23h 59m 00.1s	–32° 27' 49"	9.1	Galaxy	9.3 x 6.3
IC1459	22h 58m 27.2s	–36° 20' 21"	10.0	Galaxy	5.2 x 1.8
NGC7213	22h 10m 42.2s	–47° 03' 12"	10.1	Galaxy	3.1 x 2.8
NGC7410	22h 56m 18.4s	–39° 32' 21"	10.3	Galaxy	5.2 x 1.6
NGC7507	23h 13m 21.6s	–28° 24' 48"	10.4	Galaxy	2.8 x 2.7
NGC7424	22h 58m 36.3s	–40° 56' 51"	10.5	Galaxy	9.5 x 8.1
IC5152	22h 04m 11.3s	–51° 11' 03"	10.5	Galaxy	5.0 x 3.2
IC5267	22h 58m 32.2s	–43° 16' 21"	10.5	Galaxy	5.2 x 3.9
IC5332	23h 35m 40.6s	–35° 58' 27"	10.5	Galaxy	8.9 x 8.2
NGC7049	21h 20m 33.3s	–48° 27' 48"	10.6	Galaxy	4.5 x 3.0
NGC7513	23h 14m 27.7s	–28° 13' 57"	10.6	Galaxy	3.2 x 2.1
NGC7552 - Grus quartet	23h 17m 26.6s	–42° 27' 32"	10.6	Galaxy	3.4 x 2.7
NGC7582	23h 19m 39.2s	–42° 14' 37"	10.6	Galaxy	5.0 x 2.3
NGC6868	20h 11m 33.8s	–48° 18' 39"	10.7	Galaxy	3.6 x 2.8
NGC7090	21h 38m 03.6s	–54° 27' 04"	10.7	Galaxy	7.3 x 1.2
IC1297	19h 18m 58.1s	–39° 34' 11"	10.7	Planetary nebula	24.0"
NGC7144	21h 54m 11.4s	–48° 08' 45"	10.8	Galaxy	3.7 x 3.6
IC5201	22h 22m 21.5s	–45° 55' 06"	10.8	Galaxy	8.5 x 3.9
IC5271	22h 59m 17.7s	–33° 37' 07"	10.8	Galaxy	2.6 x 0.9
NGC6902	20h 26m 02.2s	–43° 34' 38"	10.9	Galaxy	5.6 x 3.9
NGC7184	22h 03m 56.3s	–20° 42' 03"	10.9	Galaxy	5.9 x 1.3
NGC7314	22h 37m 02.0s	–25° 55' 50"	11.0	Galaxy	4.6 x 2.0
IC5150	22h 00m 58.4s	–39° 16' 27"	11.0	Planetary nebula	2.2

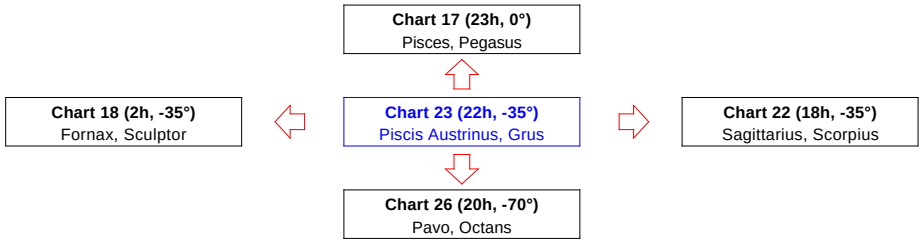
Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
STFA 52 AB (Dabih)	20h 23m 35.6s	–14° 37' 57"	3.15 / 6.08	205.4 / 267
PZ 7 AC	22h 34m 05.8s	–32° 06' 30"	4.28 / 7.12	30.4 / 172
JC 20 AC	23h 09m 27.5s	–43° 16' 15"	4.45 / 7.77	158.9 / 292
SHY 834 AC	23h 37m 32.3s	–42° 21' 37"	4.70 / 6.68	294.1 / 212
SHY 836	23h 41m 22.9s	–45° 21' 24"	4.74 / 7.05	804.4 / 122
SHJ 323 AD	20h 31m 29.0s	–17° 39' 27"	4.97 / 6.68	258.7 / 150
SEE 437 AC	21h 09m 24.3s	–41° 11' 55"	5.66 / 7.92	127.8 / 88
SHY 811 AC	22h 39m 38.7s	–40° 21' 04"	5.88 / 6.29	337.9 / 275
SHJ 324 AB (*o* Cap)	20h 32m 31.7s	–18° 25' 34"	5.91 / 6.68	22.0 / 239
DUN 241	22h 39m 09.7s	–31° 25' 27"	5.93 / 7.55	93.4 / 32
SKF 760 (AL Scl)	23h 57m 39.0s	–31° 39' 55"	6.09 / 6.82	133.9 / 1
DUN 249 (DQ Gru)	23h 26m 29.1s	–53° 33' 21"	6.14 / 7.07	26.4 / 211
DUN 248 AB,C	23h 23m 23.6s	–50° 03' 14"	6.15 / 6.58	17.0 / 212
H 6 119 AB	22h 42m 16.6s	–28° 05' 04"	6.43 / 7.50	86.5 / 157
HJ 5188 AC	20h 23m 17.3s	–29° 02' 55"	6.66 / 7.55	27.3 / 321
DUN 236	21h 05m 14.2s	–42° 49' 06"	6.68 / 6.95	57.4 / 73
JC 19 AB	22h 27m 22.0s	–41° 12' 20"	6.68 / 8.15	14.8 / 59
CRU 9041 AD	22h 27m 22.0s	–41° 12' 20"	6.68 / 7.80	237.0 / 37

Main variable stars

Name	RA (J2023)	DEC	Magnitude	Max/Per (d)	Type
RT Cap	20h 18m 27.1s	–21° 14' 44"	8.9 / 11.7	393	P - Semi-irr

Navigation map



Stellar magnitudes

Types of stars

Symbols for deep sky objects (star cluster, nebula, galaxy) and constellation figure/boundary

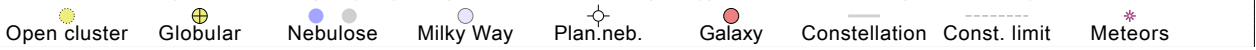
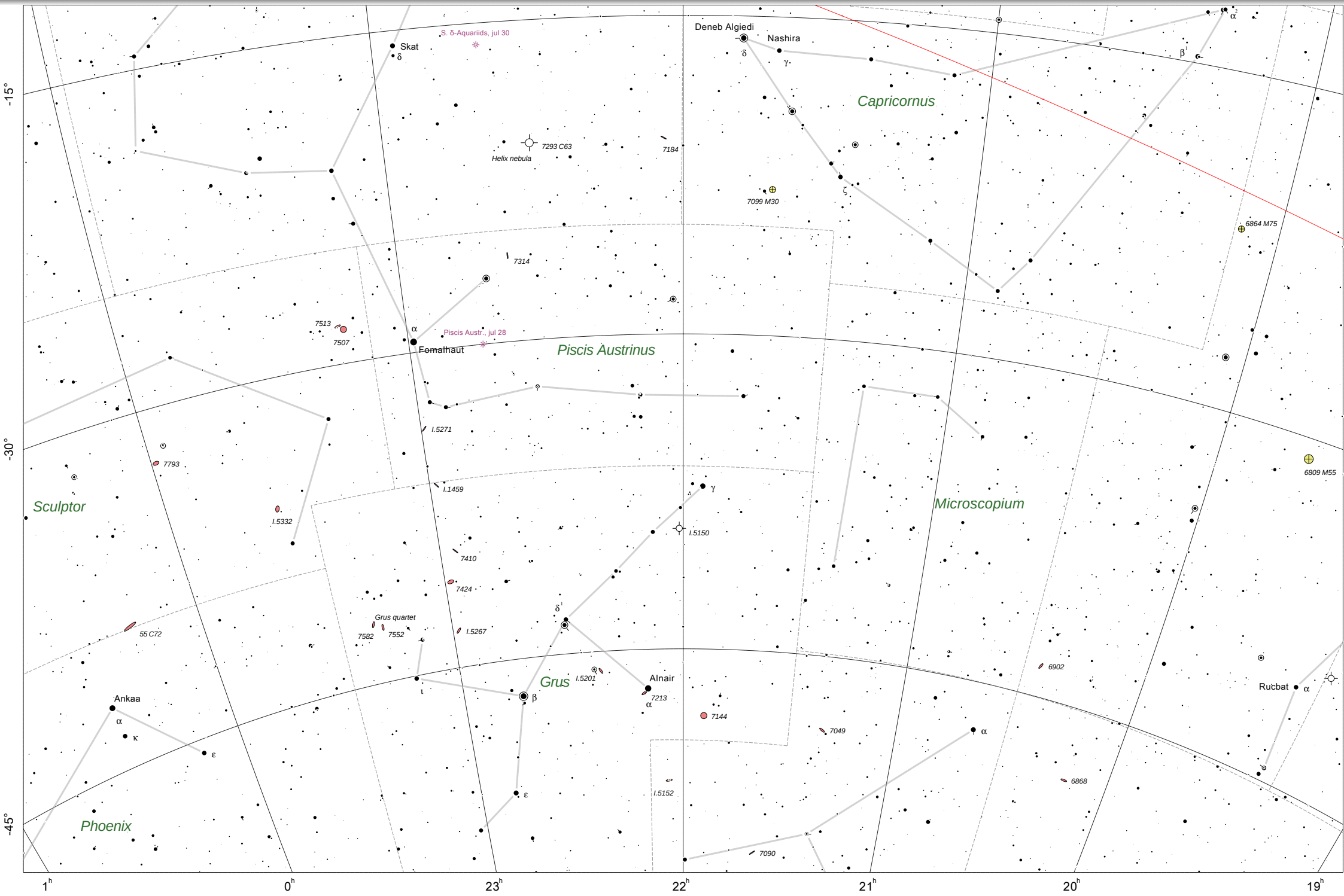


Chart 23, 30º around 22.0h, -35.0º (Piscis Austrinus, Grus, Sculptor, Aquarius)



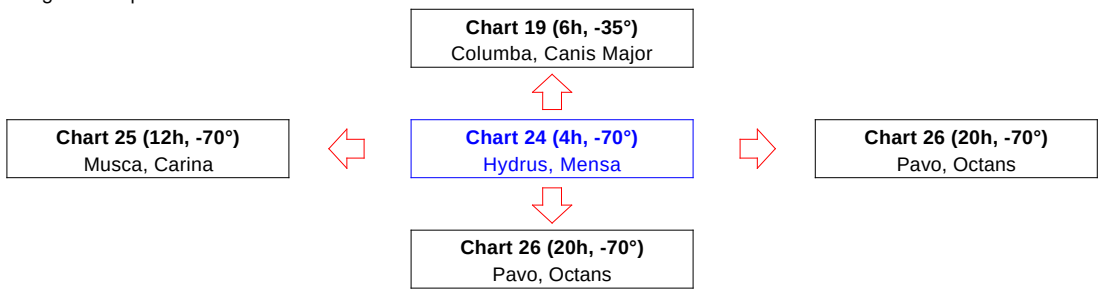
Main objects visible on chart 24

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
NGC2070 CALDWELL 103 - Tarantula nebula (30 Dor)	05h 38m 33.1s	–69° 05' 20"		Nebula	30.0 x 20.0
LMC - Large Magellanic Cloud	05h 23m 23.0s	–69° 43' 58"	0.5	Galaxy	7.20°
NGC292 - Small Magellanic Cloud	00h 53m 32.8s	–72° 42' 14"	2.3	Galaxy	5.32° x 3.42°
NGC2516 CALDWELL 96	07h 58m 26.9s	–60° 48' 59"	3.8	Open cluster	22.0
NGC104 CALDWELL 106 - 47 Tucanae	00h 25m 05.8s	–71° 57' 11"	4.0	Globular cluster	50.0
NGC3114	10h 03m 20.6s	–60° 12' 42"	4.2	Open cluster	35.0
NGC2808	09h 12m 29.5s	–64° 57' 28"	6.2	Globular cluster	14.0
NGC362 CALDWELL 104	01h 04m 00.9s	–70° 43' 29"	6.8	Globular cluster	14.0
NGC1261 CALDWELL 87	03h 12m 53.1s	–55° 07' 51"	8.3	Globular cluster	6.8
NGC2055	05h 36m 52.3s	–69° 25' 08"	8.4	Open cluster	36.0"
NGC1829	05h 04m 54.1s	–68° 01' 30"	8.5	Open cluster	2.1
NGC1313	03h 18m 33.0s	–66° 24' 44"	8.7	Galaxy	9.2 x 7.2
NGC1814	05h 03m 46.0s	–67° 16' 11"	9.0	Open cluster	1.0
NGC1816	05h 03m 50.4s	–67° 13' 47"	9.0	Open cluster	1.0
NGC1820	05h 04m 03.6s	–67° 14' 27"	9.0	Open cluster	
NGC1850	05h 08m 38.5s	–68° 43' 60"	9.0	Open cluster	3.4
NGC1955	05h 26m 07.4s	–67° 28' 43"	9.0	Open cluster	1.8
NGC1968	05h 27m 21.5s	–67° 26' 43"	9.0	Open cluster	1.1
NGC1974	05h 27m 58.0s	–67° 24' 19"	9.0	Open cluster	1.7
NGC2014	05h 32m 16.3s	–67° 40' 28"	9.0	Open cluster	1.8
NGC2050	05h 36m 28.4s	–69° 22' 14"	9.3	Open cluster	1.0
NGC1553	04h 16m 40.7s	–55° 43' 25"	9.4	Galaxy	4.5 x 2.8
NGC1747	04h 55m 11.7s	–67° 07' 59"	9.4	Open cluster	24.0 x 20.0
NGC330	00h 57m 06.8s	–72° 20' 17"	9.6	Globular cluster	1.4
NGC2004	05h 30m 38.2s	–67° 16' 11"	9.6	Open cluster	2.7
NGC2042	05h 36m 01.0s	–68° 54' 37"	9.6	Open cluster	9.0
NGC2060	05h 37m 41.9s	–69° 09' 38"	9.6	Nebula	3.4
NGC2100	05h 41m 59.1s	–69° 12' 07"	9.6	Open cluster	2.8
NGC1566	04h 20m 31.6s	–54° 52' 60"	9.7	Galaxy	8.2 x 6.5
NGC1672	04h 46m 04.6s	–59° 12' 26"	9.7	Galaxy	6.7 x 5.6
NGC1818	05h 04m 17.2s	–66° 24' 13"	9.7	Open cluster	3.4
NGC1848	05h 07m 10.1s	–71° 09' 59"	9.7	Open cluster	2.0
NGC1866	05h 13m 43.9s	–65° 26' 23"	9.7	Open cluster	4.5
NGC1549	04h 16m 15.4s	–55° 32' 07"	9.8	Galaxy	4.9 x 4.1
NGC1994	05h 28m 12.7s	–69° 07' 27"	9.8	Open cluster	36.0"
NGC1731	04h 53m 33.8s	–66° 53' 19"	9.9	Open cluster	8.0
NGC1755	04h 55m 11.9s	–68° 10' 06"	9.9	Open cluster	2.6
NGC1761	04h 56m 44.9s	–66° 26' 39"	9.9	Open cluster	1.2
NGC1858	05h 09m 48.0s	–68° 52' 14"	9.9	Open cluster	
NGC1983	05h 27m 35.9s	–68° 58' 05"	9.9	Open cluster	2.0
NGC1984	05h 27m 31.9s	–69° 06' 59"	10.0	Open cluster	3.0 x 2.4
NGC1712	04h 50m 51.2s	–69° 22' 10"	10.0	Open cluster	2.5
NGC1901	05h 17m 42.3s	–68° 24' 36"	10.0	Open cluster	40.0
NGC1711	04h 50m 26.5s	–69° 56' 50"	10.1	Open cluster	2.4
NGC1856	05h 09m 21.5s	–69° 05' 59"	10.1	Open cluster	1.8
NGC1871	05h 13m 50.1s	–67° 25' 38"	10.1	Open cluster	2.0
NGC2002	05h 30m 19.8s	–66° 52' 04"	10.1	Open cluster	2.0
NGC1845	05h 05m 31.1s	–70° 33' 06"	10.2	Open cluster	20.0
NGC2157	05h 57m 24.7s	–69° 11' 45"	10.2	Open cluster	2.7
NGC2210	06h 11m 22.2s	–69° 07' 38"	10.2	Open cluster	2.1
NGC2037	05h 34m 42.0s	–69° 43' 21"	10.3	Open cluster	30.0"
NGC2164	05h 58m 47.7s	–68° 30' 54"	10.3	Open cluster	2.5
IC2553	10h 10m 04.1s	–62° 43' 36"	10.3	Planetary nebula	9.0"
NGC1574	04h 22m 26.3s	–56° 55' 17"	10.4	Galaxy	4.0 x 3.6
NGC1617	04h 32m 10.2s	–54° 33' 14"	10.4	Galaxy	4.3 x 2.1
NGC1854	05h 09m 13.3s	–68° 49' 10"	10.4	Globular cluster	4.6
NGC1873	05h 13m 54.4s	–67° 18' 32"	10.4	Open cluster	3.5
NGC1916	05h 18m 26.8s	–69° 23' 02"	10.4	Open cluster	2.0
NGC2016	05h 31m 23.2s	–69° 55' 33"	10.4	Open cluster	18.0"
NGC2041	05h 36m 26.9s	–66° 58' 36"	10.4	Open cluster	42.0"
NGC2122	05h 48m 38.7s	–70° 03' 49"	10.4	Open cluster	4.5
NGC2442	07h 36m 19.3s	–69° 34' 59"	10.4	Galaxy	6.0 x 5.0
IC2448	09h 07m 19.5s	–70° 02' 05"	10.4	Planetary nebula	27.0"
IC2501	09h 39m 27.2s	–60° 11' 46"	10.4	Planetary nebula	1.8"
NGC1543	04h 13m 10.4s	–57° 40' 46"	10.5	Galaxy	3.8 x 2.8
NGC1782	04h 57m 43.3s	–69° 21' 28"	10.5	Open cluster	1.2
NGC2136	05h 52m 47.1s	–69° 29' 19"	10.5	Open cluster	1.9
NGC1767	04h 56m 19.6s	–69° 21' 56"	10.6	Open cluster	1.6
NGC1805	05h 02m 25.0s	–66° 04' 49"	10.6	Open cluster	2.2
NGC1835	05h 04m 57.1s	–69° 22' 25"	10.6	Open cluster	1.2
NGC1837	05h 04m 41.4s	–70° 41' 01"	10.6	Open cluster	1.3
NGC1951	05h 26m 07.4s	–66° 34' 42"	10.6	Open cluster	1.9
NGC2011	05h 32m 17.3s	–67° 30' 28"	10.6	Open cluster	1.0
NGC2044	05h 35m 56.3s	–69° 11' 07"	10.6	Open cluster	2.0
NGC1533	04h 10m 22.1s	–56° 03' 31"	10.7	Galaxy	2.8 x 2.3
NGC1559	04h 17m 53.6s	–62° 43' 43"	10.7	Galaxy	3.5 x 2.0
NGC1947	05h 26m 56.4s	–63° 44' 33"	10.7	Galaxy	3.0 x 2.6
NGC1978	05h 28m 46.8s	–66° 13' 11"	10.7	Open cluster	3.9
NGC2098	05h 42m 24.2s	–68° 15' 57"	10.7	Open cluster	1.6
NGC3136	10h 06m 23.7s	–67° 29' 24"	10.7	Galaxy	3.1 x 2.1
NGC1735	04h 54m 20.7s	–67° 03' 49"	10.8	Open cluster	1.6
NGC1774	04h 58m 07.1s	–67° 12' 30"	10.8	Open cluster	1.8

Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
DUN 42 (γ_2 Vol)	07h 08m 20.3s	–70° 34' 28"	3.86 / 5.43	14.2 / 298
LCL 119 AC	00h 33m 37.5s	–62° 42' 16"	4.28 / 4.51	27.2 / 168
SHY 114 AE	00h 33m 37.5s	–62° 42' 16"	4.28 / 5.07	548.9 / 118
HJ 3423 A,CD	01h 17m 15.6s	–68° 38' 02"	4.88 / 7.23	319.2 / 310
ALB 1 AB (ζ_2 Ret)	03h 19m 04.8s	–62° 20' 26"	5.30 / 5.57	309.1 / 217
BSO 17 AB (κ_1 Vol)	08h 19m 39.1s	–71° 39' 42"	5.31 / 5.59	64.0 / 58
BSO 17 AC	08h 19m 39.1s	–71° 39' 42"	5.31 / 7.67	98.4 / 48
SHY 528 AC	08h 39m 37.6s	–79° 07' 42"	5.44 / 6.11	501.4 / 140
BSO 17 BC	08h 19m 51.3s	–71° 39' 08"	5.59 / 7.67	37.2 / 30
DUN 18 AB (ι Pic)	04h 51m 57.3s	–53° 23' 10"	5.61 / 6.24	12.8 / 59
HJ 3568 (BN Hyi)	03h 06m 05.4s	–78° 48' 49"	5.70 / 7.70	14.9 / 226
DUN 5 (p Eri)	01h 41m 30.6s	–55° 57' 42"	5.78 / 5.90	11.6 / 186
DUN 30 AB,CD	06h 30m 57.2s	–50° 16' 23"	5.97 / 7.98	11.7 / 312
DUN 60 (V461 Car)	08h 02m 30.0s	–54° 38' 44"	6.10 / 7.86	40.2 / 162
SHY 462 AB	04h 19m 48.2s	–52° 45' 04"	6.16 / 7.80	270.4 / 236
DUN 62 (V375 Car)	08h 05m 21.8s	–62° 58' 09"	6.22 / 7.80	86.3 / 259
DUN 20 AB,C	05h 25m 48.9s	–52° 16' 39"	6.24 / 6.74	38.3 / 288
DUN 34	06h 45m 09.2s	–54° 44' 43"	6.44 / 6.66	129.3 / 192
DUN 27 AB	06h 16m 57.5s	–59° 13' 56"	6.49 / 7.61	32.5 / 234
HJ 3822 AB	05h 58m 12.6s	–53° 25' 23"	6.63 / 7.58	55.6 / 303
DUN 2 (λ_1 Tuc)	00h 54m 08.8s	–69° 15' 17"	6.70 / 7.35	91.8 / 15
DUN 26 AB (9 Lyn)	06h 12m 17.5s	–65° 32' 41"	6.86 / 8.07	20.6 / 120
DUN 247	23h 20m 41.9s	–60° 45' 06"	6.87 / 8.17	51.8 / 294
BSO 16 (V389 Car)	07h 22m 14.2s	–62° 02' 28"	6.89 / 8.36	170.4 / 210
HJ 4053 AB	08h 09m 00.0s	–61° 12' 49"	6.91 / 8.45	11.5 / 98

Navigation map

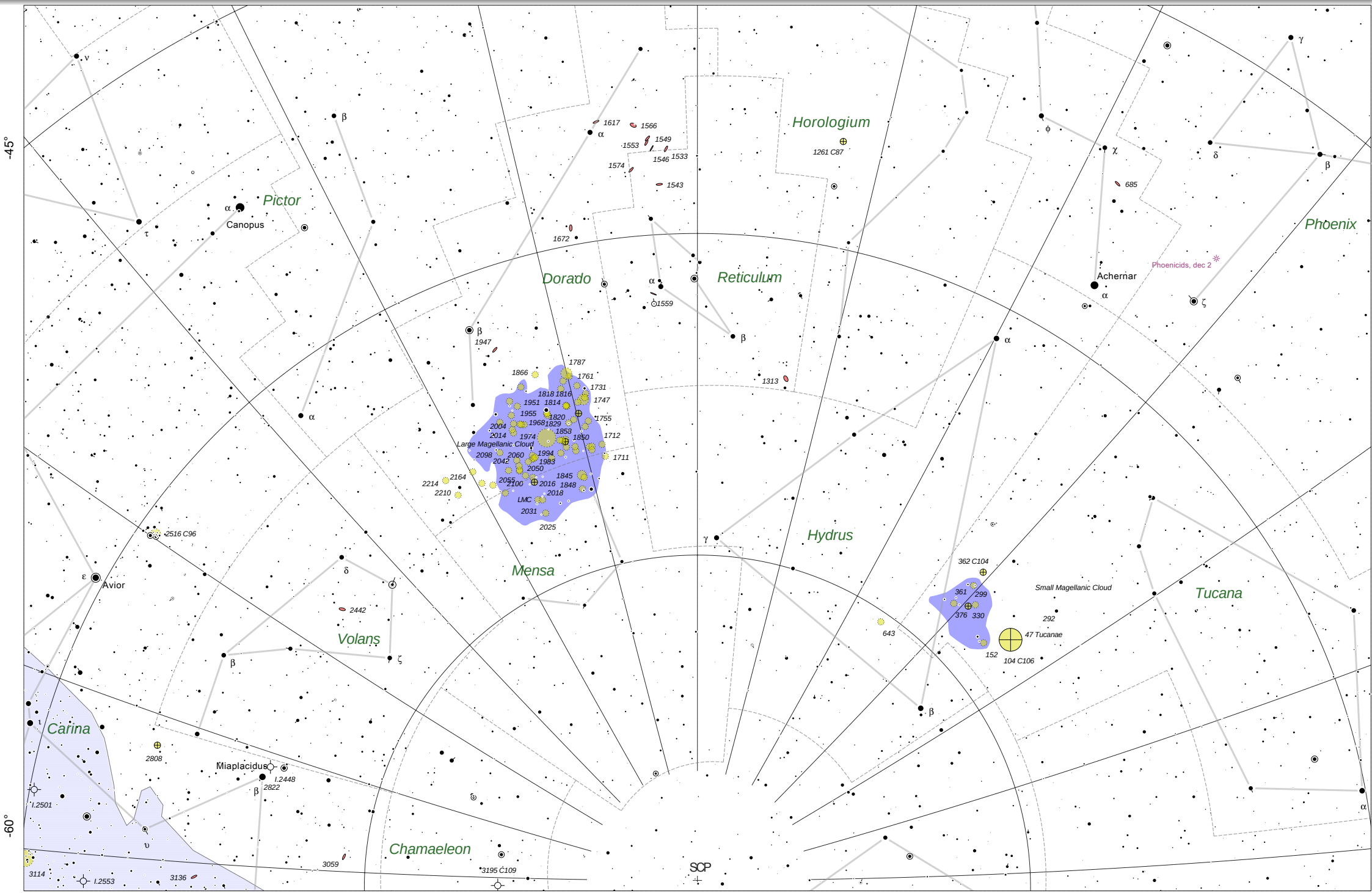


Stellar magnitudes: -1 0 1 2 3 4 5 6 7 8

Types of stars: Double, Variable

Symbols for deep sky objects (star cluster, nebula, galaxy) and constellation figure/boundary: Open cluster, Globular, Nebulose, Milky Way, Plan.neb., Galaxy, Constellation, Const. limit, Meteors

Chart 24, 30º around 4.0h, -70.0º (Hydrus, Mensa, Dorado, Reticulum)



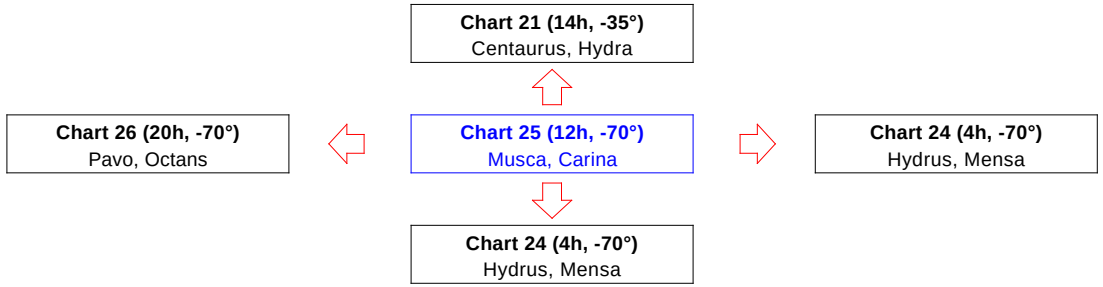
Main objects visible on chart 25

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
CALDWELL 99 - Coalsack	12h 51m 23.7s	−62° 37' 30"		Nebula	7.0° x 5.0°
IC2944 CALDWELL 100 - Running Chicken nebula	11h 36m 51.8s	−63° 08' 50"		Nebula	40.0 x 20.0
NGC3372 CALDWELL 92 - Eta Carinae nebula	10h 45m 59.8s	−59° 59' 17"		Nebula	2.0°
LMC - Large Magellanic Cloud	05h 23m 23.0s	−69° 43' 58"	0.5	Galaxy	7.20°
IC2602 CALDWELL 102 - Southern Pleiades	10h 43m 46.1s	−64° 30' 54"	1.6	Open cluster	1.67°
IC2391 CALDWELL 85 - Omicron Velorum cluster	08h 40m 57.6s	−52° 59' 57"	2.6	Open cluster	60.0
NGC3532 CALDWELL 91	11h 06m 38.9s	−58° 51' 28"	3.0	Open cluster	50.0
NGC2516 CALDWELL 96	07h 58m 26.9s	−60° 48' 59"	3.8	Open cluster	22.0
NGC3114	10h 03m 20.6s	−60° 12' 42"	4.2	Open cluster	35.0
NGC4755 CALDWELL 94 - Jewel Box	12h 55m 02.4s	−60° 29' 10"	4.2	Open cluster	10.0
IC2581	10h 28m 17.8s	−57° 44' 36"	4.3	Open cluster	5.0
IC2395	08h 43m 14.7s	−48° 11' 31"	4.6	Open cluster	13.0
NGC3293 - Gem cluster	10h 36m 44.0s	−58° 20' 59"	4.7	Open cluster	5.0
NGC6025 CALDWELL 95	16h 05m 15.9s	−60° 29' 36"	5.1	Open cluster	15.0
NGC3766 CALDWELL 97	11h 37m 19.3s	−61° 44' 15"	5.3	Open cluster	15.0
NGC5139 CALDWELL 80 - Omega Centauri	13h 28m 10.2s	−47° 35' 59"	5.3	Globular cluster	55.0
NGC6087 CALDWELL 89 - S Normae cluster	16h 20m 47.0s	−57° 57' 14"	5.4	Open cluster	15.0
NGC5662	14h 37m 11.0s	−56° 45' 44"	5.5	Open cluster	30.0
NGC5460	14h 09m 05.1s	−48° 24' 31"	5.6	Open cluster	35.0
NGC5281	13h 48m 14.6s	−63° 01' 25"	5.9	Open cluster	8.0
NGC3228	10h 22m 16.5s	−51° 50' 41"	6.0	Open cluster	5.0
NGC5316	13h 55m 38.4s	−61° 57' 44"	6.0	Open cluster	15.0
NGC2669	08h 46m 59.3s	−53° 01' 12"	6.1	Open cluster	14.0
NGC2808	09h 12m 29.5s	−64° 57' 28"	6.2	Globular cluster	14.0
NGC5617	14h 31m 28.3s	−60° 48' 44"	6.3	Open cluster	10.0
NGC5822	15h 05m 44.0s	−54° 25' 40"	6.5	Open cluster	35.0
NGC3572	11h 11m 25.9s	−60° 22' 08"	6.6	Open cluster	7.0
NGC3201 CALDWELL 79	10h 18m 33.6s	−46° 31' 34"	6.9	Globular cluster	20.0
NGC4609 CALDWELL 98	12h 43m 41.8s	−63° 07' 11"	6.9	Open cluster	6.0
NGC2910	09h 31m 15.1s	−53° 00' 57"	7.2	Open cluster	6.0
NGC4372 CALDWELL 108	12h 27m 07.5s	−72° 47' 09"	7.2	Globular cluster	5.0
NGC4463	12h 31m 14.6s	−64° 54' 59"	7.2	Open cluster	6.0
NGC3330	10h 39m 42.0s	−54° 14' 07"	7.4	Open cluster	6.0
NGC4103	12h 07m 52.0s	−61° 22' 41"	7.4	Open cluster	6.0
NGC4349	12h 25m 22.9s	−61° 59' 51"	7.4	Open cluster	4.0
NGC5286 CALDWELL 84	13h 47m 54.6s	−51° 29' 13"	7.4	Globular cluster	11.0
IC2488	09h 28m 08.6s	−57° 03' 27"	7.4	Open cluster	18.0
NGC3247	10h 25m 03.0s	−57° 52' 50"	7.6	Open cluster	5.0
NGC5138	13h 28m 46.0s	−59° 09' 37"	7.6	Open cluster	8.0
NGC3519	11h 04m 59.9s	−61° 29' 33"	7.7	Open cluster	8.0
NGC5606	14h 29m 29.7s	−59° 44' 03"	7.7	Open cluster	3.0
NGC2670	08h 46m 14.4s	−48° 52' 35"	7.8	Open cluster	7.0
NGC5823 CALDWELL 88	15h 07m 13.9s	−55° 41' 30"	7.9	Open cluster	12.0
NGC5927	15h 29m 40.9s	−50° 45' 02"	8.0	Globular cluster	6.0
Hogg18	14h 52m 19.8s	−52° 21' 38"	8.0	Open cluster	3.0
NGC3918 - Blue planetary	11h 51m 26.6s	−57° 18' 36"	8.1	Planetary nebula	22.8"
NGC6362	17h 34m 17.6s	−67° 03' 45"	8.1	Globular cluster	15.0
NGC3496	11h 00m 32.7s	−60° 27' 37"	8.2	Open cluster	7.0
NGC3590	11h 13m 58.5s	−60° 54' 51"	8.2	Open cluster	2.0
IC2714	11h 18m 21.8s	−62° 50' 51"	8.2	Open cluster	15.0
NGC2925	09h 33m 56.9s	−53° 29' 55"	8.3	Open cluster	15.0
NGC3960	11h 51m 42.1s	−55° 48' 16"	8.3	Open cluster	7.0
NGC4439	12h 29m 43.8s	−60° 13' 48"	8.4	Open cluster	4.0
NGC4833 CALDWELL 105	13h 01m 08.9s	−70° 59' 52"	8.4	Globular cluster	14.0
NGC4945 CALDWELL 83	13h 06m 47.1s	−49° 35' 08"	8.4	Galaxy	19.8 x 4.0
NGC5925	15h 29m 10.8s	−54° 36' 25"	8.4	Open cluster	20.0
Mel101	10h 43m 00.7s	−65° 13' 15"	8.4	Open cluster	15.0
NGC4815	12h 59m 25.7s	−65° 05' 08"	8.6	Open cluster	5.0
NGC3033	09h 49m 25.7s	−56° 31' 10"	8.8	Open cluster	12.0
NGC4052	12h 03m 11.4s	−63° 20' 59"	8.8	Open cluster	10.0
NGC5749	14h 50m 28.6s	−54° 35' 17"	8.8	Open cluster	10.0
NGC4337	12h 25m 19.3s	−58° 15' 03"	8.9	Open cluster	3.5
NGC4852	13h 01m 33.5s	−59° 44' 13"	8.9	Open cluster	12.0
NGC5999	15h 53m 58.7s	−56° 32' 24"	9.0	Open cluster	3.0
NGC3603	11h 16m 06.5s	−61° 23' 12"	9.1	Open cluster	4.0
NGC5168	13h 32m 39.6s	−61° 03' 25"	9.1	Open cluster	4.0
NGC6101 CALDWELL 107	16h 28m 27.4s	−72° 15' 06"	9.2	Globular cluster	5.0
NGC2867 CALDWELL 90	09h 22m 04.4s	−58° 24' 35"	9.7	Planetary nebula	24.0"
NGC3105	10h 01m 28.6s	−54° 53' 55"	9.7	Open cluster	2.0
IC4291	13h 38m 31.1s	−62° 12' 35"	9.7	Open cluster	4.0
NGC5315	13h 55m 41.9s	−66° 37' 32"	9.8	Planetary nebula	13.8"
NGC5715	14h 45m 21.6s	−57° 40' 00"	9.8	Open cluster	7.0
NGC2972	09h 41m 01.0s	−50° 25' 31"	9.9	Open cluster	5.0
NGC6221	16h 54m 46.3s	−59° 15' 17"	9.9	Galaxy	3.5 x 2.5
NGC4976	13h 09m 58.9s	−49° 37' 41"	10.0	Galaxy	5.6 x 3.0
NGC5643	14h 34m 10.0s	−44° 16' 29"	10.0	Galaxy	4.7 x 4.2
NGC2866	09h 22m 53.0s	−51° 12' 04"	10.0	Open cluster	20.0
NGC5189 - Spiral planetary nebula	13h 35m 11.3s	−66° 05' 27"	10.0	Planetary nebula	2.3
IC4499	15h 04m 11.2s	−82° 18' 09"	10.1	Globular cluster	8.0
NGC2157	05h 57m 24.7s	−69° 11' 45"	10.2	Open cluster	2.7
NGC2210	06h 11m 22.2s	−69° 07' 38"	10.2	Open cluster	2.1
NGC6300	17h 19m 09.3s	−62° 50' 37"	10.2	Galaxy	4.3 x 2.8
IC4406	14h 23m 54.6s	−44° 15' 16"	10.2	Planetary nebula	1.8
NGC2164	05h 58m 47.7s	−68° 30' 54"	10.3	Open cluster	2.5
IC2553	10h 10m 04.1s	−62° 43' 36"	10.3	Planetary nebula	9.0"
NGC2122	05h 48m 38.7s	−70° 03' 49"	10.4	Open cluster	4.5
NGC2442	07h 36m 19.3s	−69° 34' 59"	10.4	Galaxy	6.0 x 5.0
IC2448	09h 07m 19.5s	−70° 02' 05"	10.4	Planetary nebula	27.0"
IC2501	09h 39m 27.2s	−60° 11' 46"	10.4	Planetary nebula	1.8"
NGC2136	05h 52m 47.1s	−69° 29' 19"	10.5	Open cluster	1.9
IC4191	13h 10m 20.6s	−67° 45' 55"	10.6	Planetary nebula	4.8"
NGC3136	10h 06m 23.7s	−67° 29' 24"	10.7	Galaxy	3.1 x 2.1
NGC3211	10h 18m 35.5s	−62° 47' 08"	10.7	Planetary nebula	19.2"
NGC5333	13h 55m 51.6s	−48° 37' 30"	10.7	Galaxy	1.9 x 1.0

Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
DUN 252 AC	12h 29m 12.2s	−63° 21' 12"	1.25 / 4.80	89.0 / 203
DUN 125 AC	12h 50m 26.9s	−59° 56' 21"	1.28 / 7.17	373.1 / 23
DUN 252 BC	12h 29m 12.2s	−63° 21' 13"	1.55 / 4.80	89.0 / 203
DUN 124 AB (Gacrux)	12h 33m 44.9s	−57° 22' 01"	1.83 / 6.45	133.2 / 24
JC 2 AB (δ Cen)	12h 10m 46.6s	−50° 58' 42"	2.51 / 4.42	269.1 / 325
JC 2 AC	12h 10m 46.6s	−50° 58' 42"	2.51 / 6.35	216.9 / 227
DUN 166 AB (α Cir)	14h 46m 18.4s	−65° 10' 05"	3.18 / 8.47	15.7 / 224
DUN 176 (ζ Lup)	15h 15m 37.8s	−52° 16' 08"	3.50 / 6.74	71.6 / 249
DUN 42 (γ_2 Vol)	07h 08m 20.3s	−70° 34' 28"	3.86 / 5.43	14.2 / 298
DUN 102 AB (u Car)	10h 55m 22.6s	−59° 05' 56"	3.88 / 6.23	160.4 / 205
DUN 103 AC	10h 55m 22.6s	−59° 05' 56"	3.88 / 7.84	55.6 / 6
DUN 126 AB (μ_1 Cru)	12h 57m 20.6s	−57° 25' 35"	3.94 / 4.95	34.5 / 17
DUN 95 AB (x Vel)	10h 41m 08.7s	−55° 50' 39"	4.38 / 6.06	51.8 / 106
DUN 133 AB,C	13h 25m 39.4s	−61° 13' 38"	4.49 / 6.15	60.4 / 346
HJ 4825 AB,C	16h 07m 19.2s	−57° 53' 52"	4.64 / 8.02	11.3 / 242
DUN 131 AC	13h 18m 26.6s	−68° 08' 11"	4.76 / 7.24	58.2 / 331
BSO 18 A,BC (HY Vel)	08h 43m 44.2s	−53° 16' 52"	4.79 / 5.45	76.3 / 311
DUN 74 (b1 Car)	08h 58m 05.4s	−59° 24' 31"	4.87 / 6.58	40.1 / 76
DUN 94 (t2 Car)	10h 40m 30.9s	−59° 25' 25"	4.89 / 7.48	14.6 / 21
BSO 22 AB (δ_1 Aps)	16h 27m 24.6s	−78° 47' 59"	4.90 / 5.41	103.0 / 10
FGL 1 AB,C	12h 02m 00.5s	−78° 28' 40"	4.91 / 6.62	134.0 / 39
RMK 18 (N Cen)	13h 55m 05.1s	−53° 02' 13"	5.24 / 7.50	18.5 / 289
BSO 17 AB (κ_1 Vol)	08h 19m 39.1s	−71° 39' 42"	5.31 / 5.59	64.0 / 58
BSO 17 AC	08h 19m 39.1s	−71° 39' 42"	5.31 / 7.67	98.4 / 48
SHY 528 AC	08h 39m 37.6s	−79° 07' 42"	5.44 / 6.11	501.4 / 140

Navigation map



Stellar magnitudes

-1 0 1 2 3 4 5 6 7 8

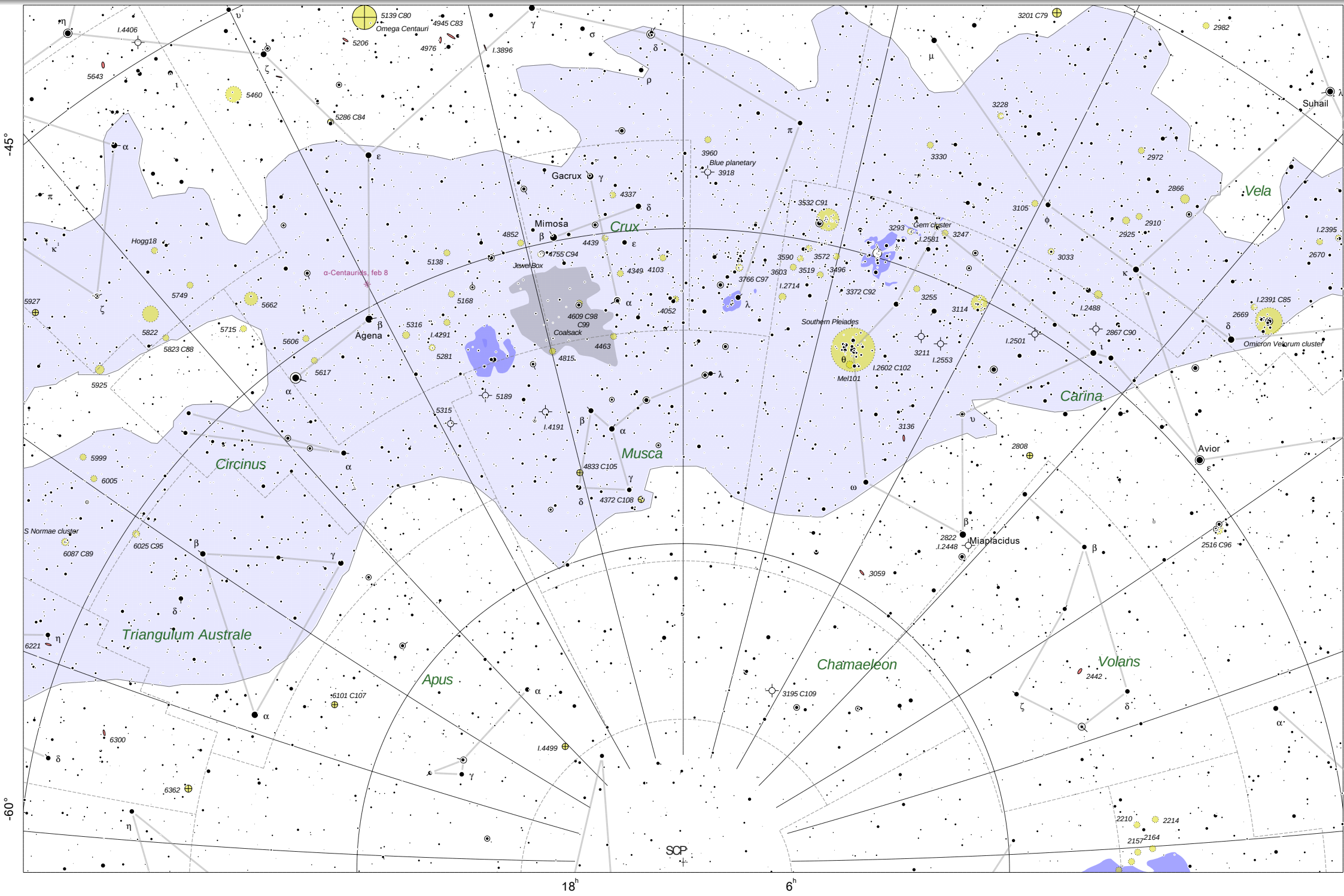
Types of stars

Double Variable

Symbols for deep sky objects (star cluster, nebula, galaxy) and constellation figure/boundary

Open cluster Globular Nebulose Milky Way Plan.neb. Galaxy Constellation Const. limit Meteors

Chart 25, 30º around 12.0h, -70.0º (Musca, Carina, Circinus, Centaurus)



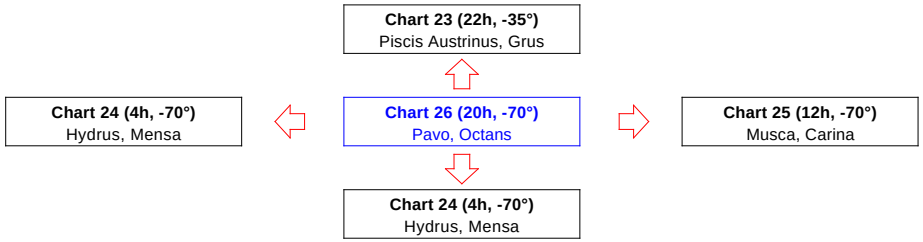
Main objects visible on chart 26

Name	RA (J2023)	DEC	Magnitude	Type	Angular size (')
NGC292 - Small Magellanic Cloud	00h 53m 32.8s	–72° 42' 14"	2.3	Galaxy	5.32° x 3.42°
NGC104 CALDWELL 106 - 47 Tucanae	00h 25m 05.8s	–71° 57' 11"	4.0	Globular cluster	50.0
NGC6025 CALDWELL 95	16h 05m 15.9s	–60° 29' 36"	5.1	Open cluster	15.0
NGC6193 CALDWELL 82	16h 43m 04.1s	–48° 48' 21"	5.2	Open cluster	14.0
NGC6397 CALDWELL 86	17h 42m 33.7s	–53° 40' 60"	5.3	Globular cluster	31.0
NGC6752 CALDWELL 93	19h 12m 53.1s	–59° 56' 31"	5.3	Globular cluster	29.0
NGC6087 CALDWELL 89 - S Normae cluster	16h 20m 47.0s	–57° 57' 14"	5.4	Open cluster	15.0
NGC6067	16h 14m 59.8s	–54° 16' 34"	5.6	Open cluster	15.0
NGC5281	13h 48m 14.6s	–63° 01' 25"	5.9	Open cluster	8.0
NGC6250	16h 59m 37.4s	–45° 58' 14"	5.9	Open cluster	16.0
NGC5316	13h 55m 38.4s	–61° 57' 44"	6.0	Open cluster	15.0
NGC6322	17h 20m 04.6s	–42° 57' 24"	6.0	Open cluster	5.0
NGC5617	14h 31m 28.3s	–60° 48' 44"	6.3	Open cluster	10.0
NGC6167	16h 36m 19.5s	–49° 49' 05"	6.7	Open cluster	7.0
NGC362 CALDWELL 104	01h 04m 00.9s	–70° 43' 29"	6.8	Globular cluster	14.0
NGC6388	17h 37m 58.0s	–44° 44' 50"	6.8	Globular cluster	10.4
IC4651	17h 26m 38.9s	–49° 57' 45"	6.9	Open cluster	10.0
NGC6208	16h 51m 16.5s	–53° 44' 36"	7.2	Open cluster	18.0
NGC6200	16h 45m 51.1s	–47° 30' 39"	7.4	Open cluster	15.0
NGC5606	14h 29m 29.7s	–59° 44' 03"	7.7	Open cluster	3.0
NGC6352 CALDWELL 81	17h 27m 14.2s	–48° 26' 27"	7.8	Globular cluster	9.0
NGC6584	18h 20m 27.9s	–52° 12' 13"	7.9	Globular cluster	6.6
NGC6259	17h 02m 25.4s	–44° 41' 14"	8.0	Open cluster	15.0
NGC6152	16h 34m 33.2s	–52° 41' 26"	8.1	Open cluster	25.0
NGC6362	17h 34m 17.6s	–67° 03' 45"	8.1	Globular cluster	15.0
NGC6204	16h 47m 50.0s	–47° 03' 08"	8.2	Open cluster	6.0
NGC6249	16h 59m 21.9s	–44° 50' 19"	8.2	Open cluster	6.0
NGC6031	16h 09m 22.6s	–54° 04' 36"	8.5	Open cluster	3.0
NGC6744 CALDWELL 101	19h 11m 56.4s	–63° 49' 04"	8.5	Galaxy	20.1 x 12.9
NGC5999	15h 53m 58.7s	–56° 32' 24"	9.0	Open cluster	3.0
NGC6101 CALDWELL 107	16h 28m 27.4s	–72° 15' 06"	9.2	Globular cluster	5.0
NGC330	00h 57m 06.8s	–72° 20' 17"	9.6	Globular cluster	1.4
NGC5315	13h 55m 41.9s	–66° 37' 32"	9.8	Planetary nebula	13.8"
NGC6115	16h 26m 13.5s	–52° 00' 17"	9.8	Open cluster	3.4
NGC6221	16h 54m 46.3s	–59° 15' 17"	9.9	Galaxy	3.5 x 2.5
NGC7213	22h 10m 42.2s	–47° 03' 12"	10.1	Galaxy	3.1 x 2.8
IC4499	15h 04m 11.2s	–82° 18' 09"	10.1	Globular cluster	8.0
NGC6253	17h 00m 55.8s	–52° 44' 56"	10.2	Open cluster	4.0
NGC6300	17h 19m 09.3s	–62° 50' 37"	10.2	Galaxy	4.3 x 2.8
NGC6684	18h 51m 12.9s	–65° 08' 42"	10.4	Galaxy	4.6 x 2.9
IC5052	20h 54m 16.6s	–69° 07' 03"	10.5	Galaxy	5.9 x 0.9
IC5152	22h 04m 11.3s	–51° 11' 03"	10.5	Galaxy	5.0 x 3.2
NGC7049	21h 20m 33.3s	–48° 27' 48"	10.6	Galaxy	4.5 x 3.0
NGC6005	15h 57m 39.5s	–57° 30' 33"	10.7	Open cluster	5.0
NGC7090	21h 38m 03.6s	–54° 27' 04"	10.7	Galaxy	7.3 x 1.2
NGC7144	21h 54m 11.4s	–48° 08' 45"	10.8	Galaxy	3.7 x 3.6
IC5201	22h 22m 21.5s	–45° 55' 06"	10.8	Galaxy	8.5 x 3.9
NGC376	01h 04m 36.7s	–72° 42' 03"	10.9	Open cluster	1.0
NGC6782	19h 25m 58.0s	–59° 52' 33"	11.0	Galaxy	2.4 x 2.0
NGC7205	22h 10m 06.2s	–57° 19' 45"	11.0	Galaxy	4.0 x 2.0
NGC152	00h 33m 53.0s	–72° 59' 22"	11.0	Open cluster	1.7
NGC299	00h 54m 13.2s	–72° 04' 19"	11.0	Open cluster	42.0"
NGC361	01h 02m 57.0s	–71° 29' 00"	11.0	Open cluster	1.6
NGC643	01h 35m 23.5s	–75° 26' 22"	11.0	Open cluster	1.5

Main double stars

Name	RA (J2023)	DEC	Magnitude	Sep (") / PA (°)
DUN 166 AB (α Cir)	14h 46m 18.4s	–65° 10' 05"	3.18 / 8.47	15.7 / 224
LCL 119 AC	00h 33m 37.5s	–62° 42' 16"	4.28 / 4.51	27.2 / 168
SHY 114 AE	00h 33m 37.5s	–62° 42' 16"	4.28 / 5.07	548.9 / 118
HJ 4825 AB,C	16h 07m 19.2s	–57° 53' 52"	4.64 / 8.02	11.3 / 242
HJ 3423 A,CD	01h 17m 15.6s	–68° 38' 02"	4.88 / 7.23	319.2 / 310
BSO 22 AB (δ_1 Aps)	16h 27m 24.6s	–78° 47' 59"	4.90 / 5.41	103.0 / 10
TOK 331 AC	19h 26m 32.4s	–54° 19' 53"	5.02 / 7.09	416.3 / 171
SHY 314	19h 14m 41.9s	–68° 20' 42"	5.41 / 7.59	449.2 / 1
SHY 759 AB	19h 54m 37.1s	–59° 04' 22"	5.48 / 7.06	406.6 / 232
DUN 227	19h 56m 16.2s	–54° 50' 54"	5.80 / 6.39	23.0 / 148
HJ 5114 AB	19h 31m 28.5s	–54° 13' 40"	5.85 / 8.24	76.1 / 236
JRN 16 AD	14h 52m 43.1s	–66° 46' 55"	5.86 / 7.72	88.2 / 322
DUN 249 (DQ Gru)	23h 26m 29.1s	–53° 33' 21"	6.14 / 7.07	26.4 / 211
DUN 248 AB,C	23h 23m 23.6s	–50° 03' 14"	6.15 / 6.58	17.0 / 212
DUN 232 (μ_2 Oct)	20h 47m 01.6s	–75° 10' 57"	6.51 / 7.07	16.6 / 19
JC 25 AB	21h 47m 13.3s	–57° 06' 42"	6.54 / 6.90	152.3 / 4
JC 25 AC	21h 47m 13.3s	–57° 06' 42"	6.54 / 7.47	187.0 / 214
DUN 2 (λ_1 Tuc)	00h 54m 08.8s	–69° 15' 17"	6.70 / 7.35	91.8 / 15
DUN 247	23h 20m 41.9s	–60° 45' 06"	6.87 / 8.17	51.8 / 294

Navigation map



Stellar magnitudes: -1 0 1 2 3 4 5 6 7 8

Types of stars: Double Variable

Symbols for deep sky objects (star cluster, nebula, galaxy) and constellation figure/boundary: Open cluster, Globular, Nebulose, Milky Way, Plan.neb., Galaxy, Constellation, Const. limit, Meteors

Chart 26, 30º around 20.0h, -70.0º (Pavo, Octans, Indus, Telescopium)