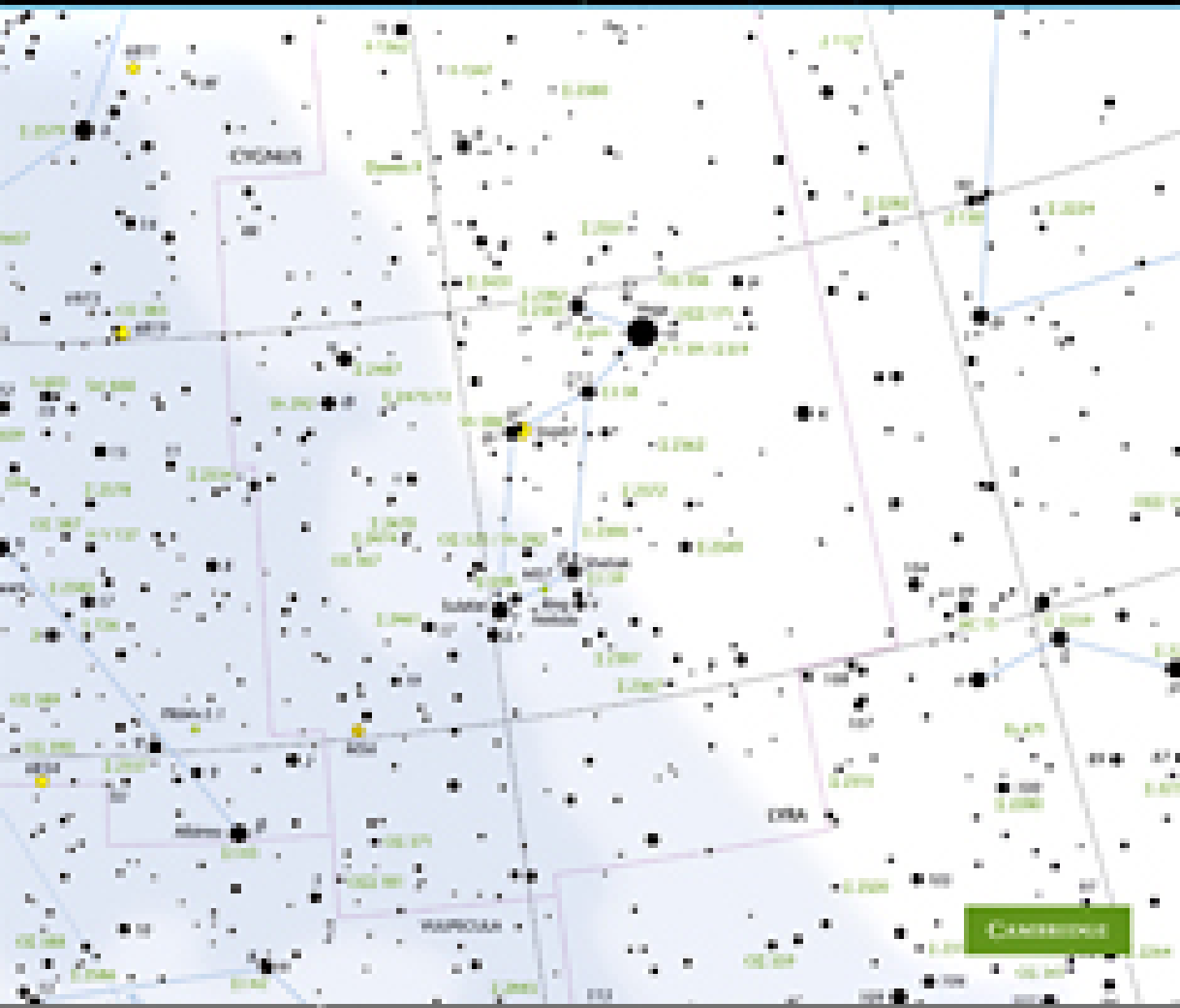
James Mullaney and Wil Tirion

THE CAMBRIDGE DOUBLE STAR ATLAS



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The Cambridge Double Star Atlas

This magnificent atlas contains the most attractive and interesting double and multiple stars for viewing with binoculars and telescopes. It is a must-have for stargazers who want to explore these fascinating objects.

The first modern star atlas devoted to double and multiple stars, it plots nearly 2,400 selected pairs, each labeled with discoverer, catalog, and/or observatory designations. A superb introduction to this important class of celestial objects, it is spiral bound and printed in red-light friendly colors, making it ideal for use in the field.

Written by experienced observer James Mullaney, and beautifully illustrated by renowned celestial cartographer Wil Tirion, this atlas provides an easy-to-use "celestial roadmap" to locate and identify double and multiple stars. Other deep-sky objects such as star clusters, nebulae, and galaxies are also included, and are color-coded for easy recognition and identification, making this an all-purpose observing reference.

JAMES MULLANEY, former assistant editor at *Sky & Telescope* magazine, is an astronomy writer, lecturer, and consultant, who has published more than 500 articles and seven books on observing the wonders of the heavens.

WIL TIRION is a full-time uranographer. He is famous for the numerous star charts he has created for astronomy books, atlases, and magazines.

THE CAMBRIDGE DOUBLE STAR ATLAS

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INTRODUCTION

We are very pleased to present what is the first major modern star atlas devoted primarily to the observation of visual double and multiple stars. With the widespread growing popularity of viewing these tinted jewels of the heavens by amateur astronomers today, the need for such a work clearly exists. The one classic atlas that identified these objects, along with their discoverers and/or catalog designations, was *Norton's Star Atlas* through its first 17 editions. Sadly, all later revised and redrawn versions of this atlas – initially re-titled *Norton's 2000.0* and currently back to the original *Norton's Star Atlas* – dropped the discoverer and catalog labels (along with those of the clusters, nebulae and galaxies discovered by the Herschels) to the dismay of observers of both classes of deep-sky wonders.

It is now estimated that at least 80 percent of the stellar population exists as pairs or multiple systems of suns. Their amazing profusion, combined with a seemingly endless variety of color combinations, brightnesses, separations, and component configurations, make them fascinating objects for both leisurely viewing and serious study. Abounding as they do among the naked-eye stars, literally thousands of them are visible with even the smallest of glasses (and, in the case of the wider pairs, with binoculars as well) and on all but the very worst of nights – including those with bright moonlight, haze and heavy light pollution. So not only are these stars plentiful and easily located, but they are truly ever-fascinating sights!

While this new atlas was primarily designed with double star observation in mind, it also serves as a general-purpose guide for viewing all types of deep-sky objects, showing as it does many prominent asterisms, star clusters, nebulae, galaxies, variable stars, and the majestic Milky Way itself.

Map parameters and selection criteria

The 30 maps comprising the *Atlas* were planned, drawn, and labeled by Wil Tirion, widely recognized as the world's greatest celestial "cartographer" and creator of such classic works as the magnificent *Sky Atlas 2000.0*. They designate nearly 2,400 double and multiple stars suitable for viewing with typical "backyard" telescopes in the 2-inch to 14-inch aperture range. These are shown using the standard symbol of a star bisected by a bar and are labeled in green, which shows up well under the red lighting used at the telescope to maintain dark-adaptation (see below). In addition to writing this introductory guide to the *Atlas*, I selected the original target list itself (as well as the showpiece roster below) based on my personal observations of tens-of-thousands of pairs over the past 50 years using literally hundreds of telescopes of all types and sizes within the aperture range stated above. No doubt, experienced observers will have favorites that are not plotted/designated as being multiple stars. If every object that is visually double in some size of telescope were to be indicated, fully half of all the stars plotted on the maps would have bars through them! But those shown certainly are *among* the most attractive and interesting in the sky, and as such offer a well-rounded selection for surveying these fascinating stellar combos. (See Appendix C for the complete target list of pairs used in creating this *Atlas*.)

All told, some 25,000 stars are plotted in half-magnitude steps on the maps to a nominal visual magnitude limit of 7.5 (the primary star's brightness combined with that of its companion/s, the cutoff for the latter being roughly magnitude 10.5), in addition to 900 non-stellar deep-sky wonders. Angular separations range from those of tight challenging binaries reaching at least 0.5 arcseconds in their orbits such as γ Virginis and ζ Herculis out to ones wide enough to be resolved with the unaided eye – ones like the well-known combos α Capricorni, ε Lyrae and θ Tauri. Pairs wider than 180 arcseconds whose companions lie at or above the 7.5 magnitude limit are plotted as separate stars on the maps.

(These objects are typically excellent targets for viewing with binoculars.)

A number of doubles that lie somewhat below the *Atlas* limit are also plotted because they have especially striking color contrasts, and/or component configurations, as well as lying in or near striking backgrounds such as that of a cluster or nebula. In addition, a very few even fainter pairs are included for reasons other than their visual attractiveness – famous ones like Winnecke 4, notable as actually being Messier 40, and Krueger 60, a red dwarf binary flare star. And while mentioning dim objects below our limit, it's very important to point out here that many of the double and multiple stars plotted *often have one or more fainter pairs lying within the same low-power eyepiece field*! Thus, observers should always check the field of view for these unsuspected but fascinating duos in addition to scrutinizing the primary target object itself.

A magnitude scale and color-coded key to the symbols used to denote various types of deep-sky objects appears at the top of each map. Note that the edges of the maps have green-arrowed numbers indicating adjoining maps (with some overlap) in each direction, which will be very helpful in navigating the *Atlas*. Also, blue solid lines have been used to connect the principal stars in each constellation, the boundaries of which are indicated by dashed lavender lines. These so-called "stick figures" also help you find your way around the sky. Many observers today use computerized ("Go To") target acquisition, and at least some of the brighter doubles plotted – particularly those given in the showpiece roster below – can be so located by entering their designation, common name and/or coordinates on the controller's keypad. (See Appendix C for a complete list of all pairs plotted.) While these systems typically contain thousands of traditional deep-sky objects, double and multiple stars have largely been given short-shift by the programmers of their databases. And to many of us "purists," this modern technology takes away much of the fun of good old-fashioned "star hopping" to learn and find your way around the sky – which is really one of the primary purposes of a star atlas like this one.

Discoverer/catalog/observatory designations

Presented below is a list of all the designations used to identify the double and multiple stars plotted on the *Atlas* in addition to their proper or common names (if any), and Bayer (Greek) letter or Flamsteed number. There are several important things to note in this regard. First, in some cases there may be a difference between a discoverer's original designation and an official catalog designation. As one example, the striking triple system β Monocerotis is widely known as "Herschel's Wonder Star" after Sir William Herschel who discovered it. But its designation (in addition to its Greek letter/constellation) shown in all listings is Σ 919, signifying that it is the 919th entry in the great double star observer Wilhelm Struve's monumental catalog containing both his and other's discoveries. Another case is the magnificent radiant binary α Geminorum, or Castor. First discovered by G. D. Cassini and later re-discovered by J. Bradley, it appears as Σ 1110 in double star lists, again in addition to its Greek letter/constellation. A third example involves one of the very first telescopic double stars ever noticed – the striking identical twin suns of γ Arietis. This double star was found accidentally by Robert Hooke in 1664 while following a comet but carries no designation by him, being officially labeled Σ 180. (The preponderance of various Struve designations for many of the objects plotted on the *Atlas* maps is a result of the famed Struve dynasty of early double star observers, who dominated that field, as did the Herschels in the discovery of clusters and nebulae.) The policy followed in this current work is to use the designation by which each pair is officially and/or best-known by double star observers.

There's also the matter of multiple designations for the same double star, some of which are shown on the maps and others of which are not. In the first case, an observer may have originally discovered the obvious duplicity of an object while another (typically later) observer may have found an additional companion (usually a less obvious, closer-in or dimmer one). These cases are shown as a dual designation with a slash between them – such as

Σ 205/O Σ 38, which is Almaak (also known as Almach), the superbly tinted bright multiple system γ Andromedae. There are even objects having *three* different designations, one example being the amazing double-double system ν Scorpii. Each close pair has a different discoverer, plus the two widely separated duos appear in a third observer's list as a "double" themselves!

In the second case involving multiple designations, only one may be shown when a pair actually has two (or, again, even more!) because the additional companion is much too close and/or faint to be seen with instruments in the aperture range stated above. There are also some instances where an object has duplicate designations by different independent discoverers, such as H V 12 = O ΣΣ 21 in Aries and Webb 2 = Piazzi 97 in Camelopardalis. And there are even cases of different numbers being mistakenly assigned to the same object by the same observer such as h 2052 in Cetus, which is the same pair as h 3373. But there's still more! There are a number of double stars – some quite bright and famous, such as α Scorpii (Antares) and α Centauri (Rigil Kent) – that have no official observer/catalog designation assigned to them, although their discoverers are known (Burg and Grant, and Richaud, respectively). This is also the case for some widely separated naked-eye pairs, such as ζ-1/2 Scorpii and μ-1/2 Scorpii, which appear much too obvious to have actually been "discovered" by anyone. Finally, in some cases, a discoverer's name will be given as an object's designation but without any number, one apparently never having been assigned to it for some reason.

Arranged alphabetically, the list that follows gives three columns of information. The first column provides standard symbols ranging from single or multiple Greek and Arabic letters to abbreviated and (in some cases) fully spelled-out names of discoverers and/or their catalogs/observatories. These are what have been used to label those double and multiple stars plotted only in this *Atlas*. (A complete listing of all known double star designations runs into the hundreds!) The second column gives the standard three-letter (and in some cases one- or two-letter) codes used in major computerized compilations such as the US Naval Observatory's massive online *Washington Double Star Catalog* (the *WDS*), which currently provides data on more than 100,000 double stars and is continually updated (typically nightly) as measurements come in! (See the reference section below.) In a majority of cases, these are the same letter codes shown in the first column but capitalized. The third column identifies the actual name of the discoverer and/or catalog/observatory represented by the symbols. Note that some of William Herschel's double star classes look very much the same as those used for his various classes of clusters and nebulae. However, they have totally different meanings!

Designation	WDS code	Discoverer/catalog/observatory
β	BU	S. W. Burnham
β pm	BUP	Burnham's 1913 proper motion catalog
Δ	DUN	J. Dunlop
Σ	STF	F. G. Wilhelm Struve's 1827 Dorpat catalog
Σ I	–	Wilhelm Struve's first supplement to Dorpat catalog
Σ II	–	Wilhelm Struve's second supplement to Dorpat catalog
σ	–	Appendix to *Poulkova Observations III*
ϕ	FIN	W. S. Finsen
A	A	R. G. Aitken
AC	AC	Alvan Clark
AG	AG	*Astronomische Gesellschaft Katalog*
AGC	AGC	Alvan G. Clark

Designation	WDS code	Discoverer/catalog/observatory
Arg	ARG	F. W. A. Argelander
B	B	Willem H. van den Bos
Barnard	BAR	E. E. Barnard
BrsO	BSO	Brisbane Observatory (Australia)
CapO	CPO	Cape Observatory (South Africa)
Copeland	–	L. Copeland
CorO	COO	Cordoba Observatory (Argentina)
Cou	COU	Paul Couteau
Dawes	DA	W. R. Dawes
Dem	D	Ercole Dembowski
Dju	DJU	P. Djurkovic
Don	DON	H. F. Donner
Doo	DOO	Eric Doolittle
Edg	EDG	D. W. Edgecomb
Es	ES	T. E. H. Espin
For	FOR	L. Forgeron
Frk	FRK	W. S. Franks
Gale	GLE	W. F. Gale
GAn	GAN	G. Anderson
Gli	GLI	J. M. Gilliss
H I	H	William Herschel's 1782–1784 catalogs: I = difficult
H II	H	William Herschel: II = close but measurable
H III	H	William Herschel: III = 5″ to 15″ separation
H IV	H	William Herschel: IV = 15″ to 30″ separation
H V	H	William Herschel: V = 30″ to 1′ separation
H VI	H	William Herschel: VI = 1′ to 2′ separation
H N	H	William Herschel's 1821 catalog
h	HJ	John Herschel
HdO	HDO	Harvard Observatory (USA and elsewhere)
Hld	HLD	E. S. Holden
Ho	HO	G. W. Hough
Hooke	–	Robert Hooke
Howe	HWE	H. A. Howe
Hrg	HRG	L. Hargrave
Hu	HU	W. J. Hussey
Hzg	HZG	E. Hertzsprung
I	I	R. T. A. Innes
J	J	Robert Jonckheere
Jc	JC	W. S. Jacob
Knott	KNT	G. Knott
Kr	KR	A. Krueger
Ku	KU	F. Kustner
Kui	KUI	Gerard P. Kuiper
Lac	LCL	N. de Lacaille

Designation	WDS code	Discoverer/catalog/observatory
Lal	LAL	F. de Lalande
LDS	LDS	W. J. Luyten's 1941 proper motion survey
Lewis	L	Thomas Lewis
Mh	MH	O. M. Mitchel
Mil	MIL	J. A. Miller
MlbO	MLO	Melbourne Observatory (Australia)
Mlr	MUL	Paul Muller
O Σ	STT	Otto Struve's 1843 Pulkovo catalog
O ΣΣ	STT	Otto Struve's 1843 Pulkovo catalog supplement
Pz	PZ	G. Piazzi
R	R	H. C. Russell
Rmk	RMK	C. L.C. Rumker
Roe	ROE	E. D. Roe
Rst	RST	R. A. Rossiter
S	S	James South
Sh	SHJ	James South and John Herschel joint 1824 catalog
Se	SE	A. Secchi
See	SEE	T. J. J. See
Sei	SEI	J. Scheiner
Slr	SLR	R. P. Sellors
Smyth	SMY	W. H. Smyth
Stone	STN	Ormond Stone
Vou	VOU	J. G. E. G. Voute
Webb	WEB	T. W. Webb
WFC	WFC	*Washington Fundamental Catalogue – Astrographs*
Wg	WG	R. W. Wrigley
Wnc	WNC	F. A. Winnecke
WNO	WNO	US Naval Observatory (USA)

Observer, atmosphere and instrument

It has often been stated that the person behind the eyepiece of a telescope is far more important than the size or type or quality of the instrument itself. The truth of this adage has been proven time and again – a typical example being that of a skilled observer using a small telescope seeing vastly more detail on a planet like Mars than an inexperienced one using a much larger aperture. The fact is that the eye does not work alone, but rather in conjunction with the most marvelous "image processor" known – the human brain! It was Sir William Herschel, the greatest visual astronomer that ever lived, who said that "seeing" is an art and that as observers we must properly educate our eyes to *really see* what it is that we are looking at in the eyepiece. And so this section is aimed at helping you get the most out of your nightly explorations of the heavens, especially the observation of double stars.

Training the eye

There are several distinct areas in which the human eye/brain combination can be educated to see better. Let's begin with that of visual acuity – the ability to see or resolve fine detail in an image or in splitting close double stars. There's no question that the more

time you spend at the eyepiece, the more detail you will eventually see! Even without any real purposeful training plan in mind, the eye/brain combination will learn to search for and find ever-finer detail in what it is viewing. But this process can be considerably accelerated by a simple exercise repeated daily for a period of at least several weeks. On a piece of white paper, draw a circle – say, 3 inches in diameter. Then using a soft pencil, randomly place various markings within the circle, ranging from broad patchy shadings to fine lines and points. Now place the paper at the opposite side of a room at a distance of at least 20 feet or so, and begin drawing what you see using the unaided eye. Initially, only the larger markings will be visible to you, but as you repeat this process over a period of time, you'll be able to see more and more of them. Tests have shown improvements in overall visual acuity of a factor of 10 using such procedures! Not only will you see more detail on the Sun, Moon and planets as a result, but you'll also be able to resolve much closer double stars than you were able to previously.

A second area of training the eye/brain combination involves the technique of employing *averted* (or side) *vision* in viewing faint celestial objects. This makes use of the well-known fact that the outer portion of the retina of the eye – that containing the receptors called *rods* – is much more sensitive to low levels of illumination than is the center of the eye containing the receptors known as *cones*. (See the discussion below involving color perception by the latter.) This explains the common experience of driving at night and objects seen out of the corner of your eye appearing brighter than they actually are if you turn and look directly at them. While this is especially useful in viewing low-surface-brightness targets like nebulae and galaxies (where increases in apparent brightness of 2 to 2.5 times have been reported!), averted vision is also helpful in detecting faint companions to doubles by looking to one side or the other of the primary star (above or below also works).

A third important area involving the eye/brain combination is that of color perception. At first glance, to the unaided eye the stars all appear to be white. But, upon closer inspection, differences in tint among the brighter ones reveal themselves. The lovely contrasting hues of ruddy-orange Betelgeuse and blue-white Rigel in the constellation Orion is one striking example in the winter sky. Another can be found in the summer sky by comparing blue-white Vega in Lyra, orange Arcturus in Bootes and ruddy Antares in Scorpius. Indeed, the sky is alive with color once you've been trained to see it! While the rods in the edge of the eye are light sensitive, they are essentially colorblind. Thus, for viewing the tints of stars (whether single, double or multiple) direct vision is employed – making use of the color-sensitive cones at the center of the eye. Stare directly at an object to perceive its color (and off to the side to see it brighter – unless it's already bright like a planet or brilliant star!). Many of the lovely color combinations reported for double stars are a result of contrast effects between the primary and its companion/s. However, in other cases these are very definitely real! A star's color is primarily an indication of its "surface" temperature: ruddy ones are relatively cool and bluish ones are quite hot, while yellow and orange suns fall in between these extremes. And there are even some green stars, such as the striking emerald-green companion of Antares (α Scorpii) and the sea-green or aquamarine companion of Almaak (Almach), γ Andromedae.

One final note concerning preparation of the eye to see better is that of *dark-adaptation*. It's an obvious fact that the eyes need time to adjust to the dark after coming out of a brightly lit room. Two factors are at play here. One is the dilation of the pupils themselves, which begins immediately upon entering the dark and continues for several minutes. The other involves the actual chemistry of the eye, as the hormone rhodopsin (often called "visual purple") stimulates the sensitivity of the rods to low levels of illumination. The combined result is that night vision continues to improve noticeably for perhaps half an hour or so. This explains why the sky looks black on first going outside, but later looks gray as you fully adjust to the dark. In the first instance, it's a contrast effect and in the second the eye has become sensitive to stray light, light-pollution and the natural airglow of the sky itself that were not seen initially. Double stars themselves are generally

so bright that they can be seen to advantage almost immediately upon going to the telescope (making them ideal "warm-up" targets before viewing other types of deep-sky wonders). Exceptions are faint pairs and dim companions to brighter stars (where the radiance of the primary often destroys the effect of dark-adaptation). White light causes the eye to lose its sensitivity but red light preserves it, making it standard practice to use red illumination for reading star maps and making notes at the eyepiece.

Sky conditions

A number of atmospheric and related factors affect the visibility and appearance of celestial objects in the telescope. In the case of double and multiple stars, the most important of these is atmospheric turbulence or seeing, which is an indication of the steadiness of the image. On some nights, the air is so unsteady (or "boiling" as it's sometimes referred to) that star images appear as big puffy, shimmering balls, and detail on the Moon and planets is all but non-existent. This typically happens on nights of high transparency – those having crystal-clear skies in which the air overhead is in a state of rapid motion and agitation. On other nights, fine detail stands out on the Moon and planets like an artist's etching, and star images are nearly pinpoints showing virtually no motion, with even close double stars revealing themselves easily. Such nights are often hazy and/or muggy, indicating stagnant tranquil air over the observer's head.

One of the most dramatic and revealing examples of the impact of changing seeing conditions upon the visibility of celestial objects comes from the great double star observer, S. W. Burnham, in the following classic account of the famed pair Sirius (α Canis Majoris): "An object glass of 6-inches one night will show the companion to Sirius perfectly: on the next night, just as good in every respect, so far as one can tell with the unaided eye, the largest telescope in the world will show no more trace of the small star than if it had been blotted out of existence."

Various "seeing scales" have long been employed by observers to quantify the state of atmospheric steadiness. One of the most common of these uses a 1-to-5 numerical scale, with 1 indicating hopelessly turbulent blurred images, 5 stationary razor-sharp ones, and 3 average conditions. Others prefer a 1-to-10 system, with 1 again representing very poor and 10 virtually perfect seeing, respectively. (In some schemes, the numerical sequence is reversed, with lower numbers indicating better and higher numbers poorer seeing.) Casual double star observing can be done in all but the worst of seeing conditions, but projects like that of micrometer measurements of the angular separations of close binary systems require the very best seeing possible.

Among other factors affecting telescopic image quality is that known as "local seeing" or the thermal conditions in and around the telescope itself. Heat radiating from driveways, walkways and streets, houses and other structures (especially on nights following hot days), plays a significant role. This is why observing from grassy areas away from buildings gives the best results. The cooling of the telescope's optics and tube assembly is especially critical to achieving sharp images. Depending on the season of the year, it may take up to an hour or more for the optics (especially the primary mirror in larger reflectors) to reach equilibrium with the cooling night air. During this cool-down process, air currents within the telescope tube itself can play absolute havoc with image quality, no matter how good the optics and atmospheric seeing are. (This is less of a concern using refractors with their closed tubes, which in smaller apertures at least are essentially ready for immediate use.) Surprisingly, even the heat radiating from the observer's body can be a concern here, particularly with reflecting telescopes that have open-tubed truss designs.

Resolution and magnification

Much has been written in the literature of double star observation over the years about the resolution capabilities of various size apertures, the best-known of which is *Dawes' Limit*. Derived from observations with several excellent refractors of various sizes, it states that $R = 4.56/A$, where R is the resolution in arcseconds and A is the telescope's aperture in inches. (If expressing the aperture in millimeters rather than inches, the relationship becomes $R = 116/A$.)

But this formula holds strictly true only for pairs of equal brightness and of about the 6th-magnitude. For brighter, fainter, and especially unequal pairs, Dawes' Limit departs markedly from actual results at the telescope (values as great as 36/*A* having been reported in the case of a 6th-magnitude difference between a primary and its companion!). Another resolution relationship is the *Rayleigh Criterion*. Here $R = 5.5/D$, where R is again the resolution in arcseconds and D is the diameter (or aperture) of the telescope in inches. This theoretical relationship is based on the wave nature of light and gives a somewhat less stringent and (according to many observers) a more realistic result. Part of the difference involves what is actually meant by the "resolution" of two stars. Dawes' Limit considers this to be when the first dark ring of one star's diffraction pattern intersects the other star's central disk – which means a notched or partially merged image of the pair. The Rayleigh Criterion considers a pair to be split when the outer edge of each star's diffraction disk is separated by a space equal to the width of the first dark ring – in others words, fully separated images. There's also the *Markowitz Limit* which states that for a pair to show disks just in contact $R = 6/D$, giving a yet more realistic value of what's actually seen at the eyepiece. (A more recent innovative approach to the subject of double star resolution has been developed by Christopher Lord of the Brayebrook Observatory in Britain, including an amazingly comprehensive nomogram for determining the resolution of unequal binaries. Those interested in exploring this topic further should go to www.brayebrookobservatory.org and click on "Publications.")

So the primary factors at play in determining if a given telescope will split a particular double star (aside from atmospheric conditions) are the magnitude difference and separation of its components. In achieving optimum results here, in addition to very steady seeing, the telescope must be used at what is known as its "resolving magnification." This is typically given as 25× per inch of aperture or more. But, for casual observation of double stars in general, the rule-of-thumb is to use the lowest power that just nicely separates the pair. And again, as previously mentioned above, be sure to check the field of view for any additional pairs (or fainter companions to the primary target) that may be present but that lie below the magnitude cutoff of our selections. Also, it's much more fun and "exploratory" to look at objects shown as double stars on the *Atlas* maps to see if they can be resolved, the number of companions visible and what colors if any are present *before* checking lists like those in the showpiece roster and reference sections below for what you should have seen but may have missed!

Optical quality and collimation

For the casual observation of double stars, even a telescope of mediocre optical quality can provide acceptable views, but for more demanding work – such as resolving close pairs or making micrometer measurements as some observers do – high optical quality is essential. The condition of a telescope's optics and its all-important optical alignment can readily be determined by a simple test using a star itself. Known as the extrafocal image test, this involves looking at the image of a star, both inside and outside of focus, using a medium-to-high-power eyepiece. An ideal target for this purpose is 2nd-magnitude Polaris (α Ursae Minoris), which is neither too bright nor too faint, and has the great added advantage of not moving in the eyepiece as the Earth rotates!

A telescope having first-class (or "diffraction-limited") optics in perfect alignment (or collimation) will show identical circular disks of light with a pattern of faint concentric interference rings on either side of focus as the eyepiece is racked in and out. These rings should be uniformly spaced and of even intensity; if not, this indicates zones in the optical figure – a condition known as "spherical aberration." A "shaggy" look to the rings indicates a rough polish to the glass rather than the desired smooth one. If the extrafocal images are triangular rather than circular, this shows that the objective lens or mirror is pinched in its cell. Elliptical-shaped images that rotate 90 degrees on either side of focus are the most to be feared, since they reveal the serious optical defect known as "astigmatism" or a warping of the glass itself. However, both astigmatism in the

observer's own eye, and optical misalignment can also produce the same effect. If you wear eyeglasses to correct for astigmatism, you should definitely leave them on while conducting such tests (as opposed to the usual procedure of eyeglass wearers removing them for comfort during observing and correcting by focusing the eyepiece). There have also been cases where a bad eyepiece actually caused an astigmatic image rather than the primary optical element itself. This can easily be diagnosed by simply turning the eyepiece while looking at the extrafocal star image; if the major axis of the ellipse turns with it, the problem resides in the eyepiece. (Similarly, if turning your head while looking into the eyepiece causes the ellipse to rotate, the astigmatism is in your eye and not the telescope!)

It should be pointed out here that the extrafocal image test also makes it possible to judge something of the seeing conditions – ranging from local conditions within and immediately above the telescope to the upper atmosphere itself. Undulating waves and flashing patterns of light crossing over the extrafocal image can tell much about the steadiness of the atmosphere, as well as the telescope's thermal state and environment. Careful focusing will reveal moving patterns seemingly "floating" at different levels above the light path and (with practice) show if disturbances are atmospheric, or are within the telescope itself or its immediate vicinity.

Optical collimation is an entire subject unto itself. The term describes that condition in which all of the optical elements in a telescope system are precisely aligned onto the same optical axis. The need for and actual process of collimation depends upon the type of instrument being used. Refractors and Maksutov-Cassegrains are typically permanently collimated and in most cases no provision is even made for adjustment. Reflectors and Schmidt-Cassegrains typically do require periodic collimation, instructions for which are normally included in the manuals provided with commercially made telescopes. (Many companies today also offer a simple "collimation eyepiece" to assist in the process, as well as more sophisticated laser-alignment devices.) For optimum resolution and image contrast in viewing double stars, a precisely collimated telescope is an absolute must.

Record-keeping

The annuals of both amateur and professional astronomy attest to the personal as well as scientific value of keeping records of our nightly vigils beneath the stars. From a strictly personal perspective, an account of what has been seen each night can have a wonderful impact as we look back over the years at our first views of this or that celestial object. Our eyepiece impressions recorded on paper (written and/or sketched) or perhaps audio-taped can provide many hours of nostalgic pleasure in years to come. For casual double star observers in particular, there's definite aesthetic value in logging the various pairs seen (especially the showpiece ones!), including their colors, component configurations and degree of visibility in a given telescope at a particular magnification under various sky conditions. In more serious undertakings like micrometer measurement actual data needs to be recorded for later analysis and submission. In either instance, the information in your logbook should ideally include the following: the date, and beginning and end times of your observations (preferably Universal Time/Date); telescope size, type and brand used; magnification/s employed; sky conditions (seeing and transparency, along with notes on passing clouds, wind, haze, moonlight and other sources of light-pollution); and finally a brief description of each object seen. And here, despite its ultimate value, it is strongly advised to keep your journaling as brief as possible. Some observers spend far more time writing about what they see at the eyepiece than they spend actually seeing it!

Personal considerations

There are a number of little-recognized factors that affect the overall success of an observing session at the telescope, one of which concerns proper dress. This is of particular importance in the cold winter months of the year, when sub-freezing temperatures are often experienced at night. It's impossible to be effective at the eyepiece, or even to simply enjoy the views, when you're half-frozen to death! Proper protection of the head, hands and feet are especially important during such times, and several layers of

clothing are recommended as opposed to one heavy one for thermal insulation of the body in general. During the summer months, the opposite problem occurs as observers attempt to stay cool. And in addition to very short nights at this time of year, there's the added annoyance of flying insects and optics-fogging humidity and dew.

Another concern is proper posture at the telescope. It has been repeatedly shown that the eye sees more detail in a comfortably seated position than when standing, twisting or bending at the eyepiece! If you must stand, be sure that the eyepiece/focuser is at a level and position where you don't have to turn, bend or strain your neck and head to look into it. And, while not as critical, the same goes for positioning finder scopes where they can be reached without undue contortions.

Finally, proper rest and diet both play a role in experiencing a pleasurable observing session. Attempting to stargaze when you're physically and/or mentally exhausted is guaranteed to leave you frustrated – and seeking a buyer for your prized telescope! Even a brief "cat nap" before going out to observe after a hectic day is a real help here. Heavy meals can leave you feeling sluggish and unable to function alertly at the telescope. It's much better to "refuel" after you're done stargazing – especially since most observers find themselves famished then (particularly on cold nights!). Various liquid refreshments such as tea, coffee and hot chocolate can provide a needed energy boost while observing (and warmth when desired).

We end this section on an aesthetic/philosophical note. There is no question that the more you know about the wonders revealed by a telescope the more meaning they will hold for you. Realizing in the case of double stars, for example, that at least 55 of our Solar Systems placed end-to-end would fit in the small gap between the components of the magnificently tinted double star Albireo; or that the tiny white dwarf companion to dazzling Sirius has a density exceeding 90,000 times that of our Sun and weighs several tons per cubic inch; or that one of the stars of the lovely orange double 61 Cygni is thought to have a system of planets orbiting it definitely adds greatly to the fascination and enjoyment of viewing these lovely stellar gems – these "flowers in the meadows of heaven" as they have been referred to by both poets and observers. Perhaps this matter of preparedness has never been more eloquently expressed than in the following lines from Charles Edward Barns' long-out-of-print classic work, *1001 Celestial Wonders*:

> Let me learn all that is known of them,
> Love them for the joy of loving.
> For, as a traveler in far countries
> Brings back only what he takes,
> So shall the scope of my foreknowledge
> Measure the depth of their profit and charm to me.
> Lo, the Star-lords are assembling,
> And the banquet-board is set;
> We approach with fear and trembling,
> But we leave them with regret.

Double and multiple star showpieces

Following is a sampling of 133 of the finest . (showpiece) double and multiple stars shown in this *Atlas* for viewing with telescopes from 2- to 14-inches in aperture. Many of these starry jewels can be seen in the smallest of glasses, and some of them even in binoculars and with the unaided eye. Arranged alphabetically by constellation (which many observers find more convenient for picking out targets for a given night's observations than an arrangement ordered by coordinates), it features brief descriptions of each entry. The primary data sources used were the *Washington Double Star Catalog* and *Sky Catalogue 2000.0*. The first column of the list gives the constellation (**Con**) abbreviations, which are the official three-letter ones adopted by the International Astronomical Union (see Appendix A in conjunction with Appendix B). This is followed by the discoverer/catalog/observatory designation (**Desig**). Right Ascension (**RA**), in hours and minutes, and Declination (**Dec**), in degrees and minutes, are for the current standard Epoch 2000.0. The map number (**Map #**) indicates the map on which the object is best shown. Other column headings are the apparent visual magnitudes (**Mags**) of the components, their approximate current angular separation (**Sep**) in arcseconds, and their spectral types (**Spec**) on either the standard MKK

(Morgan–Keenan–Kellman) system or the HD (Henry Draper) system, if available. Position angles of the companions are not given for a variety of reasons (primarily the confusion resulting from the common use of star diagonals with refracting and compound telescopes, producing mirror-reversed images of the sky). Those observers desiring the latest available position angles, as well as component separations, should consult the US Naval Observatory's *Washington Double Star Catalog* on-line at http://ad.usno.navy.mil/wds/. The approximate distance in light-years (LY) is also given in many cases. Colors listed are often subjective contrast effects but in other cases are quite real – as can be seen by comparing the components with their respective spectral types. Unless an orbital period is given, or a pair is noted as being "optical" (meaning it consists of two unrelated stars that happen to lie along the same line of sight at different distances), these objects are common-proper-motion (or CPM) systems – those drifting through space together and, therefore, gravitationally bound. In most cases such pairs are actually very slowly orbiting each other, but with periods measured in thousands of years.

Object/Con	Desig	RA	Dec	Map #	Mags	Sep	Spec	Name/Description
56 AND	Σ I 4	01 56	+37 15	6	5.7, 5.9	190	K0III, M0III	Wide golden, matched pair parked on SW edge of the big open cluster NGC 752. Unrelated: 360LY & 1,200LY
γ AND	Σ 205/O Σ 38	02 04	+42 20	7	2.3, 5.0/6.3	10/0.4	K3II, B9V/A0V	Almaak (Almach). Magnificent topaz-orange & sea-green radiant combo! Companion a tight 61-yr. binary. 300LY
ζ AQR	Σ 2909	22 29	−00 01	19	4.3, 4.5	2.0	F3IV, F5IV	Matched bright, off-white close duo set in a naked-eye starry triangle. Neat sight! Famous 590-yr. binary. 76LY
94 AQR	Σ 2998	23 19	−13 28	12	5.3, 7.0	12	G5IV, K2V	Pale rose or reddish & light emerald-green double. Lovely but overlooked/neglected object. CPM pair like many here.
15 AQL	Sh 286	19 05	−04 02	18	5.5, 7.2	38	K0, K1III	Easy optical duo. Yellowish-orange & ruddy-purple or lilac.
57 AQL	Σ 2594	19 55	−08 14	19	5.7, 6.4	36	B7V, B8V	Another roomy, easy pair like 15 AQL. Both stars appear bluish-white with occasional hints of other off-white hues.
γ ARI	Σ 180	01 54	+19 18	6	4.5, 4.6	8	B9V, A1	Mesarthim. Stunning, bright, perfectly matched bluish-silver-white pair. Superb even in smallest glass! 160LY
λ ARI	H V 12=O ΣΣ 21	01 58	+23 36	6	4.9, 7.7	37	F0V, G0	Wide color- & magnitude-contrast double. Tints yellowish & pale greenish or bluish.
θ AUR	O Σ 545	06 00	+37 13	7, 8	2.7, 7.2	4	A0II, G2V	Radiant, tight magnitude-contrast pair for very steady nights & larger scopes – lilac & yellow. 110LY
κ BOO	Σ 1821	14 14	+51 47	4	4.5, 6.6	14	A7V, F1V	Pretty double – tints real but elusive. Optical pair.
π BOO	Σ 1864	14 41	+16 25	10	4.9, 5.8	6	B9, A6V	Closer version of κ BOO – both stars bluish-white.
ζ BOO	Σ 1865	14 41	+13 44	17	4.5, 4.6	0.7	A0V, A0V	Bright, perfectly matched, ultra-close 123-yr. binary. An elongated egg seen in small apertures. Both stars white.
ε BOO	Σ 1877	14 45	+27 04	10	2.6, 4.8	2.9	K0II, A2V	Izar. Bright tight, superb pale-orange & sea-green pair. W. Struve's "the most beautiful one." Likely a slow binary.
ξ BOO	Σ 1888	14 51	+19 06	10	4.8, 7.0	6	G8V, K5V	Yellow & reddish-purple combo – simply breathtaking! 150-yr. binary. Very closeby – just 22LY

Object/Con	Desig	RA	Dec	Map #	Mags	Sep	Spec	Name/Description
μ BOO	Σ I 28/Σ 1938	15 24	+37 23	10	4.3, 7.1/7.6	107/2.2	F2IV, K0/K0	Neat triple system! Yellow & two oranges. Close pair is 260-yr. period binary. A fascinating sight. 95LY
32 CAM	Σ 1694	12 49	+83 25	1	5.3, 5.8	22	A1III, A0V	Very nice but neglected, matched off-white pair. 495LY
ζ CNC	Σ 1196	08 12	+17 39	8	5.3, 6.3, 6.2	0.9, 6	F8V, F9V, G5V	Splendid closely matched trio. Binaries having 60- & 1,150-yr. periods. All three stars yellowish. 70LY
ι CNC	Σ 1268	08 47	+28 46	8	4.1, 6.9	31	G8III, A3V	The Albireo (β CYG) of Spring. Striking orange & clear-blue starry jewels! 165LY
α CVN	Σ 1692	12 56	+38 19	9	2.9, 5.5	19	A0, F0V	Cor Caroli. Lovely bright, blue-white & lilac pair – one of the best. Said to be optical but doesn't look it! 130LY
α CMA	AGC 1	06 45	−16 43	22	−1.5, 8.5	7	A1V, WDA	Sirius. Dazzling blue-white sapphire with famed white-dwarf companion! Orbital period 51 yrs. Now widening but still not an easy split most nights. Closeby – just 9LY!
ε CMA	CapO 7	06 59	−28 58	22	1.5, 7.5	7	B2II, B	Adhara. A fainter version of Sirius (α CMA) but easier. Nice magnitude contrast. Both stars bluish. 490LY
CMA	h 3945	07 17	−23 19	22	5.0, 5.8	27	K3I, F0	The Albireo (β CYG) of Winter. Splendid orange & blue combo! Largely unknown & unobserved – a pity!
α-1/2 CAP	Σ I 51	20 18	−12 33	19	4.2, 3.7	381	G9III, G3I	Algiedi. Naked-eye/binocular saffron-orange pair with 9.6- & 10.6-mag. companions at 46″ & 7″ forming a telescopic double-double. Surprisingly – unrelated: 110LY & 700LY!
υ CAR	Rmk 11	09 47	−65 04	28	3.0, 6.0	5	A8I, F0	Cozy bright pair – bluish & greenish. Likely a slow binary.
CAR	Δ 94	10 39	−59 11	28	4.9, 7.5	14	K4III, A	Unequal orange & bluish-white duo near Eta CAR Nebula.
CAS	Σ 3053	00 03	+66 06	2	5.9, 7.3	15	G9III, A1V	Little-known, lovely orange & blue combo – optical pair?
η CAS	Σ 60	00 49	+57 49	2	3.4, 7.4	13	G0V, M0V	The "Easter Egg" double. Striking yellow & ruddy-purple or garnet jewels! 480-yr. nearby binary – just 19LY
ι CAS	Σ 262	02 29	+67 24	2	4.6, 6.9, 8.4	2.5, 7	A5, F5, G5	Elegant but challenging triple system – tints yellow, lilac & blue. Close pair a 620-yr. binary. 160LY

Object/Con	Desig	RA	Dec	Map #	Mags	Sep	Spec	Name/Description
σ CAS	Σ 3049	23 59	+55 45	2	5.0, 7.2	3	B1V, B3V	Tight pair with intense bluish & greenish tints. Likely a very long-period binary. Quite distant – 1,400LY
δ CEN	Jc 2	12 08	−50 43	28	2.5, 4.4, 6.3	270, 217	B2I, B5, B9V	Very wide, bright, bluish-white trio – superb in binoculars.
3 CEN	H III 101	13 52	−33 00	23	4.5, 6.0	8	B5III, B8V	Little-known but striking blue-white slow binary.
β CEN	Vou 31	14 04	−60 22	28	0.6, 4.0	0.9	B1 III	Hadar. Radiant bluish-white, very close pair for steady nights & larger apertures. Likely long-period binary. 490LY
α CEN	Richaud (no #)	14 40	−60 50	28	0.1, 1.2	13	G2V, K1V	Famed "Alpha Centauri" – magnificent yellow & gold 80-yr. binary & closest star system to us – just 4.3LY!
β CEP	Σ 2805	21 29	+70 34	2	3.2, 7.9	13	B2III, A2V	Neat unequal pair displaying exquisite magnitude contrast. Tints are greenish-white & blue or purple. 980LY
CEP	Σ 2816	21 39	+57 29	2	5.7, 7.5, 7.5	12, 20	O6	Striking triple with double Σ 2819 (7.4, 8.6, 13″) in field – all inside big sparse, nebulous open cluster IC 1396!
CEP	Σ 2840	21 52	+55 48	2	5.6, 6.4	18	B6IV	Splendid greenish-white & bluish-white combo. Optical?
ξ CEP	Σ 2863	22 04	+64 38	2	4.4, 6.4	8	A3, F7	Attractive bright pair – subtle color contrast present. 80LY
δ CEP	Σ I 58	22 29	+58 25	2	3.5–4.4, 6.1	41	F5I-G1I, B7	Pretty pale orange & blue gems. Primary is the prototype of famed Cepheid variables – period 5.4 days. 1,300LY
γ CET	Σ 299	02 43	−03 14	13	3.6, 6.2	3	A3V, F3	Snug slow binary with unusual tints – yellow & olive. 63LY
24 COM	Σ 1657	12 35	+18 23	9	5.2, 6.3	20	K2III, A9V	Albireo (β CYG) clone. Vivid orange & blue-green duo – an intensely hued lovely gem! Optical pair? 300LY
CRA	h 5014	18 07	−43 25	25	5.7, 5.7	1.7	A5V, A5V	Neatly spaced & perfectly matched 450-yr. binary – both suns bluish-white. The globular cluster NGC 6541 lies in the same field of view, greatly adding to this pair's appeal.
γ CRA	h 5084	19 06	−37 04	25	4.5, 6.4	1.3	F8V, F8V	Tight yellowish 122-yr. binary with stars in contact! 69LY

Object/Con	Desig	RA	Dec	Map #	Mags	Sep	Spec	Name/Description
ζ CRB	Σ 1965	15 39	+36 38	10	5.0, 5.9	6	B7V, B9V	Pretty bluish-white & greenish-white suns. Slow binary.
σ CRB	Σ 2032	16 15	+33 52	10	5.6, 6.5	7	G0V, G1V	Like ζ CRB but the stars are yellowish. 890-yr. binary.
δ CRV	Sh 145	12 30	−16 31	23	3.0, 8.5	25	B9V, K2V	Algorab. Nice magnitude- & color-contrast pair. Yellow primary with violet, pale lilac or purple companion. 125LY
α CRU	–	12 27	−63 06	28	1.3, 1.6, 4.8	4, 90	B1V, B4IV, B5	Acrux. Radiant triple system – all three suns blue-white.
γ CRU	Δ 124	12 31	−57 07	28	1.6, 6.5	127	M4III, A2	Wide ruddy-orange & pale bluish-green pair. A 9.5 nearby.
μ CRU	Δ 126	12 55	−57 11	28	3.9, 5.0	35	B2IV, B3	Very striking bluish-white double – bright & easy.
β CYG	Σ I 43	19 31	+27 58	11	3.4, 4.7	35	K3II+B9V, B0V	Albireo. One of the grandest sights in all the heavens! A magnificent topaz-orange & sapphire-blue pair in glorious Milky Way setting. Finest colored double star. 380LY
δ CYG	Σ 2579	19 45	+45 08	5	2.9, 6.3	2.5	B9III, F1V	Bright, close unequal pair – quite tough! Bluish-white & greenish or ashen. Binary with 780-yr. period. 270LY
16 CYG	Σ I 46	19 42	+50 32	5	6.0, 6.2	39	G2V, G5V	Lovely wide, matched golden duo in same wide eyepiece field with the well-known "Blinking Planetary" (NGC 6826).
o-1 CYG	Σ I 50	20 14	+46 44	5	3.8, 7.0, 4.8	106, 331	K2II, B9, A5III	A very wide, easy & colorful trio – orange, blue & white, all set against the rich backdrop of the Milky Way. 200LY
61 CYG	Σ 2758	21 07	+38 45	11	5.3, 6.1	31	K5V, K7V	Exquisite, striking orange pair. Famous as the first stars to have their distance measured (11LY). A 660-yr. binary.
γ DEL	Σ 2727	20 47	+16 07	11	4.5, 5.0	9	K1IV, F7V	Superb golden-yellow & greenish-blue combo – splendid contrast! 100LY The "Ghost Double" Σ 2725 (7.5, 8.2, 6″) lies unsuspected in the same field – do you see it?
17/16 DRA	Σ 2078/Σ I 30	16 36	+52 55	5	5.4, 6.4/5.5	3/90	B9V, B9V/B9V	Nice triple system like μ BOO but the primary has the close companion (which is likely a binary). All three white.
μ DRA	Σ 2120	17 05	+54 28	5	5.7, 5.7	2.3	F7V, F7V	Cozy, yellowish-white identical twin, 670-yr. binary. 82LY

Object/Con	Desig	RA	Dec	Map #	Mags	Sep	Spec	Name/Description
ν DRA	Σ I 35	17 32	+55 11	5	4.9, 4.9	63	A4, A6V	Another set of perfectly matched suns but brighter, wider & easier than μ DRA. Both white – striking! 120LY
ψ DRA	Σ 2241	17 42	+72 09	5	4.6, 5.6	30	F5IV, G0V	Very neat yellow & lilac combo – easy & pretty.
41/40 DRA	Σ 2308	18 00	+80 00	1	5.7, 6.0	19	F7V, F7	Pale-yellow pair with a 7.5-magnitude star 222″ distant.
p ERI	Δ 5	01 40	−56 12	26	5.8, 5.9	11	K0V, K5V	Splendid matched pair – both stars orange. 485-yr. binary.
θ ERI	Piazzi (no #)	02 58	−40 18	21	3.2, 4.1	8	A4III, A1V	Acamar. Radiant white diamonds – a stunning sight! 93LY
f ERI	Δ 16	03 49	−37 37	21	4.7, 5.3	8	B9V, A1V	Bright, neatly spaced pair – both stars bluish-white.
32 ERI	Σ 470	03 54	−02 57	13	4.8, 5.9	7	G8III, A2V	Lovely topaz-yellow & sea-green in superb contrast – a real beauty! Likely a very long-period binary. 300LY
o-2 ERI	Σ 518	04 15	−07 39	13	4.4, 9.5, 11.2	83, 9	K1V, DA, M4	Faint close pair is an amazing white-dwarf & red-dwarf 250-yr. binary. Needs aperture. Very closeby – just 16LY
α FOR	h 3555	03 12	−28 59	21	4.0, 7.2	5	F8V	Nice unequal pair – pale greenish-yellow primary. A 270-yr. binary. Companion may be variable in brightness. 40LY
δ GEM	Σ 1066	07 20	+21 59	8	3.6, 8.2	6	A9III, K3V	Tight yellow & reddish-purple color- & magnitude-contrast combo. A binary of extremely long period. 53LY
α GEM	Σ 1110	07 35	+31 53	8	1.9, 3.0, 8.9–9.6	4, 71	A1V, A2V, M0V	Castor. Dazzling blue-white 445-yr. binary – an exquisite sight! Dim orange companion is the eclipsing pair YY GEM having a 20-hr. period. All one vast system! 52LY
κ HER	Σ 2010	16 08	+17 03	10	5.1, 6.2	27	G8III, K1III	Very striking yellow & garnet pair of gems! Little known.
δ HER	Σ 3127	17 15	+24 50	10	3.1, 8.3	11	A3IV, G4	Very delicate, famed optical double. White & violet. 94LY
α HER	Σ 2140	17 15	+14 23	18	3.5, 5.4	5	M5II, G5III	Rasalgethi. Bright, intensely hued orange & blue-green pair – superb! Primary a huge pulsating supergiant sun. Binary with orbital period estimated at 3,600 yrs. 380LY
ρ HER	Σ 2161	17 24	+37 09	10	4.5, 5.4	4	A0V, B9III	Neat, cozy greenish-white & bluish-white slow binary.

Object/Con	Desig	RA	Dec	Map #	Mags	Sep	Spec	Name/Description
95 HER	Σ 2264	18 02	+21 36	11	4.9, 5.2	6	A5III, G8III	Lovely twin suns with amazing "apple-green & cherry-red" tints – which look exactly like that! A rare beauty. 380LY
100 HER	Σ 2280	18 08	+26 06	11	5.8, 5.8	14	A3V, A3V	Another matched pair but wider than 95 HER & having pale off-white hues. Little-known & seldom viewed.
ε HYA	Σ 1273	08 47	−06 25	15	3.5, 6.7	3	F8V+KIII, F5	Tight 990-yr. binary. Primary is also a visual binary in big observatory scopes, having a period of just 15 yrs! 150LY
N HYA	H III 96	11 32	−29 16	23	5.6, 5.7	9	F8V, F8V	Pale yellowish-white twins – very nice effect! Formerly known as 17 CRT & sometimes still listed that way.
θ IND	h 5258	21 20	−53 27	26	4.5, 6.9	7	A5V	Pretty unequal combo, pale yellowish-white & ruddy hues.
8 LAC	Σ 2922/A 1469	22 36	+39 38	6	5.7, 6.3/10.5, 9.1	22/49, 82	B1V, B2V	Nice blue-white pair. The two fainter companions form a very delicate quadruple system with bright pair. 1,900LY
α LEO	Σ II 6	10 08	+11 58	15	1.4, 8.2	176	B7V, K1V	Regulus. Wide magnitude-contrast pair with blue-white primary & a companion that's "seemingly steeped in indigo." And so it actually appears! 78LY
γ LEO	Σ 1424	10 20	+19 51	9	2.4, 3.6	5	K0III, G7III	Algieba. Magnificent, radiant golden suns – one of the finest pairs in the heavens! A 620-yr. binary. 170LY
54 LEO	Σ 1487	10 56	+24 45	9	4.5, 6.3	6	A1V, A2V	Lovely, but little-known bluish-white & greenish-white duo, nicely paired. Likely a slow binary. 150LY
γ LEP	H VI 40	05 44	−22 27	21	3.6, 6.3	97	F6V, K2V	Lovely, wide & easy. Pale yellow & rich garnet combo awash in color. A memorable sight! 29LY
α LIB	Sh 186	14 51	−16 03	24	2.7, 5.2	230	A3IV, F4IV	Zubenelgenubi. Nice, bright, ultra-wide combo for smallest of glasses & lowest of powers. Physical (CPM) pair! 65LY
π LUP	h 4728	15 05	−47 03	29	4.6, 4.6	1.6	B5, B5	Close but striking, perfectly matched blue-white diamonds.
μ LUP	h 4753/Δ 180	15 18	−47 53	29	5.0, 4.9/6.3	1.0/22	B8V,–/A	Neat triple system in rich field. Close pair nearly identical twins – needs steady night & power for clean split.

Object/Con	Desig	RA	Dec	Map #	Mags	Sep	Spec	Name/Description
κ LUP	Δ 177	15 12	−48 44	29	3.8, 5.5	26	B9, A5	Bright, easy optical pair – both pale bluish-green in hue.
ξ LUP	Δ 196	15 57	−33 58	24	5.1, 5.6	10	A3V, B9V	Neatly paired bluish-white duo. May be optical!? 120LY
η LUP	Δ 197 = Rmk 21	16 00	−38 24	24	3.4, 7.5	16	B2IV	Bright & nicely spaced magnitude-contrast pair. 570LY
12 LYN	Σ 948	06 46	+59 27	3	5.4, 6.0, 7.1	1.7, 9	A3V	Fascinating tight trio – all three gems white. Close pair is a 700-yr. binary & third star also real part of system. 140LY
38 LYN	Σ 1334	09 19	+36 48	8	3.9, 6.1	2.6	A1V, A4V	Bright, close pair with subtle tints – pale bluish & greenish.
α LYR	H V 39/Σ II 9	18 37	+38 47	11	0.0, 9.5/ 9.5	78/118	A0V	Vega. A dazzling pale-sapphire gem with faint attendants! Exquisitely blue seen in non-apochromatic refractors! 26LY
ε-1/2 LYR	Σ 2382/Σ 2383	18 44	+39 40	11	5.0, 6.1/5.3, 5.4	2.1/2.4	A4V, F1V/A8V, F0V	Celebrated "Double-Double" multiple system – an amazing sight! Both pairs are very long-period binaries & are slowly orbiting each other 210″ apart! All four suns white. 200LY
ζ LYR	Σ I 38	18 45	+37 36	11	4.3, 5.6	44	F0IV, A0	Bright, wide & easy yellowish & greenish combo – pretty.
β LYR	Σ I 39	18 50	+33 22	11	3.3–4.3, 6.7, 9.9, 9.9	46, 67, 86	B7V+A8	Primary famous 12.9-day eclipsing binary set within a starry triangle. The Ring Nebula (M57) lies nearby. 860LY
δ LYR	Sh 586	18 54	+36 58	11	4.5, 5.6	630	M4II, B2V	Ultra-wide but very lovely reddish-orange & blue pair set in sparse open cluster Stephenson-1. Both objects 800LY
ε = 8 MON	Σ 900	06 24	+04 36	14	4.4, 6.6	12	A5IV, F5V	Pretty gold & blue pair in rich field. A very slow binary.
β MON	Σ 919	06 29	−07 02	14	4.6, 5.0, 5.3	3, 7	B3V, B3V, BV3	William Herschel's "Wonder Star." Superb trio in tight formation – all bluish-white. Fascinating spectacle! 700LY
β MUS	R 207	12 46	−68 08	28	3.5, 4.0	1.1	B2V	Radiant but tight, bluish pair for very steady nights. 470LY
ε NOR	h 4853	16 27	−47 33	28	4.5, 6.1	23	B2V, A	Nicely paired, bright, easy double with blue-white tints.
36 OPH	Sh 243	17 15	−26 36	24	5.1, 5.1, 6.7	5, 730	K0V, K1V, K5	The perfectly matched close pair is a 550-yr. binary with distant companion. All golden-orange & connected! 18LY

Object/Con	Desig	RA	Dec	Map #	Mags	Sep	Spec	Name/Description
o OPH	H III 25	17 18	−24 17	24	5.2, 6.2	10	K2, F6	Lovely pale-orange & clear-blue jewels pleasingly spaced.
70 OPH	Σ 2272	18 06	+02 30	18	4.2, 6.2	5	K0V, K4V	Famous yellow & reddish-orange binary system having an 88-yr. period. Superb object! Nearby – just 17LY
β ORI	Σ 668	05 14	−08 12	14	0.3, 6.8	10	B8I, B5V	Rigel. A brilliant blue-white supergiant sun with fainter bluish companion – splendid magnitude contrast! 900LY
η ORI	Dawes 5	05 25	−02 24	14	3.1–3.4, 4.9	1.7	B1V+B2, B?	Snug blue-white gems seemingly in contact. Primary is an eclipsing binary with an 8-day period. 1,400LY
δ ORI	Σ I 14	05 32	−00 18	14	2.4, 6.8	53	O9II, B2V	Mintaka. A wide & very easy magnitude-contrast pair with stars appearing bluish & violet in hue. 1,400LY
λ ORI	Σ 738	05 35	+09 56	14	3.5, 5.5	4	O8III, B0V	Very neat, bright & cozy double, both bluish-white with hints of violet or purple present. A very slow binary. 900LY
θ-1 ORI	Σ 748	05 35	−05 23	14	6.6, 7.5, 5.1, 6.4	9, 13, 13	B0V, B0V, O7, BOV	Famed "Trapezium" multiple star embedded in the heart of the Orion Nebula (M42/M43), appearing like diamonds on green velvet – a magnificent spectacle! Also several fainter companions – a small star cluster in the making! 1,600LY θ-2 ORI/Σ I 16 (5.0, 6.2, 52″) in same field.
ι ORI	Σ 752	05 35	−05 55	14	2.9, 7.0	11	O9III, B9	A mini-Rigel (β ORI). Diamond-like combo with Σ 747 (4.7, 5.5, 36″, both B1V) in the same radiant gem-field, forming a wide double-double system! 1,400LY
σ ORI	Σ 762	05 39	−02 36	14	3.7, 8.8, 6.6, 6.3	12, 13, 42	O9V, –, B2V, B2V	An amazing colorful multiple star with the faint triple Σ 761 (8.0, 8.5, 9.0, 68″, 8″) in field – all one vast system! Diverse hues evident on close scrutiny. 1,200LY
ζ ORI	Σ 774	05 41	−01 57	14	1.9, 3.7, 8.5	2.5, 60	O9I, B0III	Alnitak. Bright, tight, blue-white 1500-yr. binary with wide, fainter third star. Flame Nebula (NGC 2024) in same field.
ε PEG	S 798	21 44	+09 52	19	2.5, 8.7	144	K2I	Enif. John Herschel's "Pendulum Star" (tap scope & watch it happen!). Wide, unequal pair with yellow & violet hues.

Object/Con	Desig	RA	Dec	Map #	Mags	Sep	Spec	Name/Description
η PER	Σ 307	02 51	+55 54	2	3.8, 8.5	28	M3I, B?	Nice color- & magnitude-contrast double with vivid orange & blue hues. Reminds some of a dim Albireo (β CYG).
ι PIC	Δ 18	04 51	−53 28	27	5.6, 6.2	13	F0IV, F4V	Easy neatly spaced pair – pale bluish and greenish-yellow.
ψ-1 PSC	Σ 88	01 06	+21 28	6	5.3, 5.5	30	A1V, A0V	Nice & easy matched combo, both blue-white. Optical pair.
ζ PSC	Σ 100	01 14	+07 35	12	5.2, 6.2	23	A7IV, F7V	Like ψ-1 PSC but tints pale yellow & pale lilac. 140LY
α PSC	Σ 202	02 02	−02 46	13	4.1, 5.2	1.9	A0, A3	Alrescha. Lovely tight double with subtle weird tints that are very difficult to pin down. A 935-yr. binary. 130LY
k PUP	H III 27	07 39	−26 48	22	4.4, 4.6	10	B6V, B5IV	Superb, bright double sun resembling γ ARI. Both stars blue-white. Often mis-listed/plotted as κ PUP.
ξ SCO	Σ 1998	16 04	−11 22	17	4.9, 7.3	8	G1V, F5IV	Yellow pair with Σ 1999 (7.5, 8.1, 12″, G8, K5) at 280″ distance forming wide double-double. The primary is an ultra-close 46-yr. binary. May all be one system! 80LY
β SCO	H III 7	16 05	−19 48	24	2.6, 4.5	14	B0V, B2V	Graffias. Bright blue-white combo resembling famed Mizar (ζ UMA). A beautiful sight! May be optical!? 600LY
ν SCO	β 120/Mitchel (no #)	16 12	−19 28	24	4.4, 5.3/6.6, 7.2	1.3/2.4	B3V, B9/B8V, B9V	Colorful but tight double-double! Pairs 41″apart (= H V 6) Very subtle but definite tints. Fascinating spectacle! 440LY
α SCO	Burg/Grant (no #)	16 29	−26 26	24	1.0, 5.4	2.5	M2I, B3V	Antares. Beautiful fiery-red supergiant sun with elusive emerald-green companion for steady nights. A fantastic sight in large amateur telescopes! 1,200-yr. binary. 520LY
δ SER	Σ 1954	15 35	+10 32	17	4.2, 5.2	4	F0IV, F0IV	Neatly paired double with off-white hues – elegant! A very long-period binary with orbit of at least 1,000 yrs. 85LY
θ SER	Σ 2417	18 56	+04 12	18	4.6, 4.9	22	A5V, A5V	Alya. Wider version of δ SER – a very pretty, easy white pair! Thought to be an optical system!? 140LY
θ-1/2 TAU	Σ I 10	04 29	+15 52	7	3.4, 3.9	337	A7III, G7III	Wide, bright naked-eye & binocular combo in the Hyades Star Cluster near Aldebaran (α TAU). 150LY

Object/Con	Desig	RA	Dec	Map #	Mags	Sep	Spec	Name/Description
TAU	Σ 742	05 36	+22 00	7	7.1, 7.5	4	F8	What's a little pair like this doing on a showpiece list? It lies totally unsuspected in the same wide field as the Crab Nebula, just to its E – & what a surprise once spied!
6 TRI	Σ 227	02 12	+30 18	7	5.3, 6.7	4	G0III, F6V	Pretty but tight golden-yellow & bluish-green pair. (Often found designated ι TRI in many older works.) 200LY
β-1/2 TUC	Lac 119	00 32	−62 58	26	4.3, 4.5	27	B9V, A2	Nicely matched radiant double – both stars bluish-white.
ξ UMA	Σ 1523	11 18	+31 32	9	4.3, 4.8	1.7	F9V, G9V	First binary to have its orbital period determined (60-yrs.), it's now made more than three circuits since its discovery! These pale yellow twin suns appear to be in contact. 26LY
ζ/80 UMA	Σ 1744	13 24	+54 56	4	2.2, 3.9, 4.0	14, 708	A1V, A1, A5V	Famed Mizar with Alcor nearby – trio of radiant blue-white diamonds! One of the finest doubles in the sky. All three stars are unresolved spectroscopic binaries (like so many other objects on this list) – a vast sextuple system! 78LY
α UMI	Σ 93	02 32	+89 16	1	2.1, 9.0	19	F7I, F1	Polaris – the famed "Pole Star." This unequal magnitude-contrast pair exhibits an amazing (apparent) "24-hour orbital period" caused by the Earth's rotation! 430LY
γ VEL	Δ 65	08 10	−47 20	27	1.8, 4.1, 7.3	41, 2.6	O8, B3, A0	This brilliant wide pair with third close companion is one of most beautiful trios in the heavens! All three suns are bluish in hue. Distance is very uncertain – 1,000LY?
J VEL	Rmk 13	10 21	−56 03	28	4.5, 7.2, 9.2	7, 36	B3III	Pretty triple with disparate brightnesses & separations.
γ VIR	Σ 1670	12 42	−01 27	16	3.5, 3.5	1.0	F0V, F0V	Porrima. Famed bright binary with 170-yr. period, now opening from last closest approach (periastron) of the stars in 2000. These orbiting suns currently appear as a merged or notched yellowish egg in very small scopes. 39LY
γ VOL	Δ 42	07 09	−70 30	27	3.9, 5.4	14	K0III, F2V	A very bright & easily resolved pair – stars rich yellow & pale yellow in hue. Lovely sight! Thought to be optical!?

Some recommended references

Of the vast literature existing on the subject of double and multiple stars, here are a few of the most useful and interesting print and electronic publications. Although some of the older classic works have been reprinted, others are now out-of-print but are still to be found in used-book stores, observatory libraries, and also over the Internet. And while the numerical/physical parameters they contain about these objects is in most cases quite dated, their descriptive accounts have a charm, passion and warmth about them that is sadly missing from many such guides today.

R. G. Aitken, *The Binary Stars*, Dover Publications, 1963. The acknowledged professional-level classic work by one of the greatest of all double star observers.

R. Argyle, *Webb Deep-Sky Handbooks & Observing Guides*, Volume 1, *Double Stars*, second edition, Webb Deep-Sky Society, 1986. Contains lots of great practical advice on observing these objects. The Society's double star section itself can be accessed online at: http://www.webbdeepsky.com/notes/doublest01.html

R. Argyle, ed., *Observing and Measuring Visual Double Stars*, Springer-Verlag, 2004. An in-depth guide to the more serious aspects of double star observations by 11 active amateur and professional workers in the field.

R. Burnham, Jr., *Burnham's Celestial Handbook*, Volumes 1, 2 and 3, Dover Publications, 1978. One of the most comprehensive guidebooks ever written, this modern classic covers some 7,000 celestial objects, many of which are double and multiple stars. Anyone that considers themselves a stargazer simply must own a set!

P. Couteau, *Observing Visual Double Stars*, MIT Press, 1981. A professional-level work by one of the most active modern observers of binary systems.

E. Crossley, J. Glendhill and J. Wilson, *A Handbook of Double Stars*, Macmillan, 1879. A charming early classic on the subject providing a fascinating account of the field during its "golden years" of activity by amateur and professional astronomers.

European Space Agency, *Double and Multiple Systems Annex* of the Hipparcos and Tycho astrometric catalogs, 1997. Based on the two amazing astrometric satellites of the same names, this compilation provides incredibly precise values of the various positional parameters of this class of stars.

S. Haas, *Double Stars for Small Telescopes*, Sky Publishing, 2006. A delightful survey of many of the most fascinating double and multiple stars for amateur-class instruments. Haas is well-known for her charmingly picturesque accounts of the heavenly tints and hues of these objects.

E. Hartung, *Astronomical Objects for Southern Telescopes*, Cambridge University Press, 1998. Perhaps the ultimate descriptive work on the appearance of deep-sky wonders of all types as seen from the southern hemisphere. (Also includes many wonders visible from the northern hemisphere.)

A. Hirshfield and R. Sinnott, *Sky Catalogue 2000.0*, Volume 2, Sky Publishing and Cambridge University Press, 1985. One of two companion volumes to Wil Tirion's famed *Sky Atlas 2000.0*, this is perhaps the most useful and comprehensive of all such compilations. It contains data on more than 8,000 double and multiple stars, in addition to thousands of other types of deep-sky objects.

The Journal of Double Star Observations, an electronic quarterly journal published by the University of South Alabama, containing papers by both amateur and professional observers. Edited by R. K. Clark & R. Mollise, it can be downloaded without charge at: http://www.jdso.org

G. Kepple and G. Sanner, *Night Sky Observer's Guide*, Willmann-Bell, 1998. This two-volume set by a very active, long-time observing team contains a huge amount of observing and descriptive information on various types of deep-sky objects including double and multiple stars. (A third volume covering the southern hemisphere, with different co-authors, was published in 2008.)

B. Mason, G. Wycoff and W. Hartkopf, *Washington Double Star Catalog*, US Naval Observatory. This is without question *the* ultimate reference for the latest available double star data! Maintained by the US Naval Observatory, it currently contains measurements and other information on more than 100,000 of these objects and is updated continuously. It can be accessed online at: http://ad.usno.navy.mil/wds/

J. Mullaney, *Double and Multiple Stars and How to Observe Them*, Springer-Verlag, 2005. This upbeat, non-technical overview of the subject by the co-author of this *Atlas* emphasizes the pleasure to be derived from observation of these starry jewels, in addition to pointing out areas for useful work by amateur astronomers.

W. H. Smyth, *The Bedford Catalogue*, Volume 2 of a *Cycle of Celestial Objects*, Willmann-Bell, 1986. This reprinted classic from 1844 is the one that really "started it all" in terms of turning observers onto the fascinating world of deep-sky observing with small instruments. The majority of its 850 objects are double and multiple stars.

R. Tanguay, *The Double Star Observer's Handbook*, self-published, 2003. An amazingly comprehensive and useful text covering all aspects of serious double star observing by both amateur and professional astronomers. It's been compared to a much-needed, modern version of Aiken's classic work, *The Binary Stars*.

T. W. Webb, *Celestial Objects for Common Telescopes*, Volume 2, Dover Publications, 1962. First published in 1859 as a single volume, this charming classic quickly became the most loved and used guidebook of its day – a popularity that has continued right up to the present time. Later editions contain nearly 4,000 objects, some 90 percent of which are double and multiple stars!

About the authors

Wil Tirion never had any formal education in astronomy. His training was focused on graphic art and design, although the starry sky and especially star maps have always fascinated him. In the fields of astronomy and uranography (mapping the sky), he is what is known as an "autodidact." In 1977, purely for his own enjoyment, he started making his first star atlas, which showed stars down to magnitude 6.5. It was published in the *Encyclopedia of Astronomy*, edited by Colin Ronan (Hamlyn, London, 1979) and in 1981 as a separate set of maps by the British Astronomical Association (*BAA Star Charts 1950.0*). In 1978, still as a hobby, he started working on a larger atlas entitled *Sky Atlas 2000.0*, showing stars down to magnitude 8.0. Its publication in 1981 (Sky Publishing Corporation, USA, co-published by Cambridge University Press, UK), resulted in requests from several additional publishers to execute star maps for a variety of purposes. In 1983 he decided to quit his job as a graphic artist and designer, and become a full-time uranographer. Since then he has created such popular star atlases as the *Bright Star Atlas 2000.0* and the *The Cambridge Star Atlas*, and has cooperated with others on much larger atlases like *Uranometria 2000.0*. He has also created numerous star maps for various astronomy books and magazines. In 1987 he was honored by receiving the "Dr. J. van der Bilt Prize," a Dutch award for outstanding work by amateur astronomers. This was followed in 1993 by a more international "award" when minor planet (4648) Tirion = 1931 UE was named after him. His website is: www.wil-tirion.com.

James Mullaney is an astronomy writer, lecturer and consultant who has published more than 500 articles and seven books on observing the wonders of the heavens, and logged over 20,000 hours of stargazing time with the unaided eye, binoculars and telescopes. Formerly Curator of the Buhl Planetarium and Institute of Popular Science in Pittsburgh and more recently Director of the DuPont Planetarium, he served as staff astronomer at the University of Pittsburgh's Allegheny Observatory and as an editor for *Sky & Telescope*, *Astronomy* and *Star & Sky* magazines. One of the contributors to Carl Sagan's award-winning *Cosmos* PBS-Television series, his work has received recognition from such notables (and fellow stargazers) as Sir Arthur Clarke, Johnny Carson, Ray Bradbury, Dr. Wernher von Braun, and former student – NASA scientist/astronaut Dr. Jay Abt. His 50-year mission as a "celestial evangelist" has been to "Celebrate the Universe!" – to get others to look up at the majesty of the night sky and to personally experience the joys of stargazing. In February of 2005 he was elected a Fellow of the prestigious Royal Astronomical Society of London.

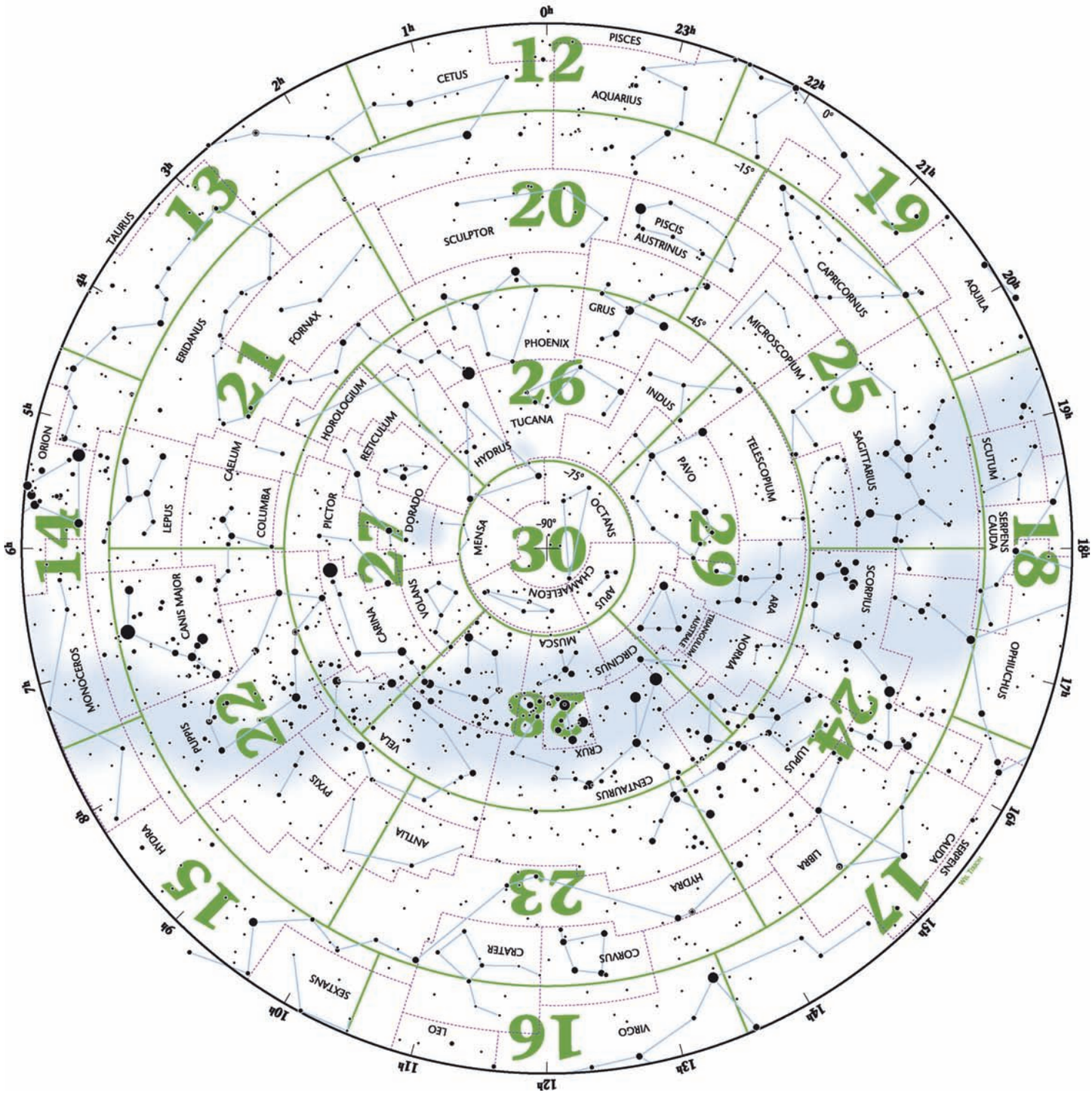
Acknowledgements

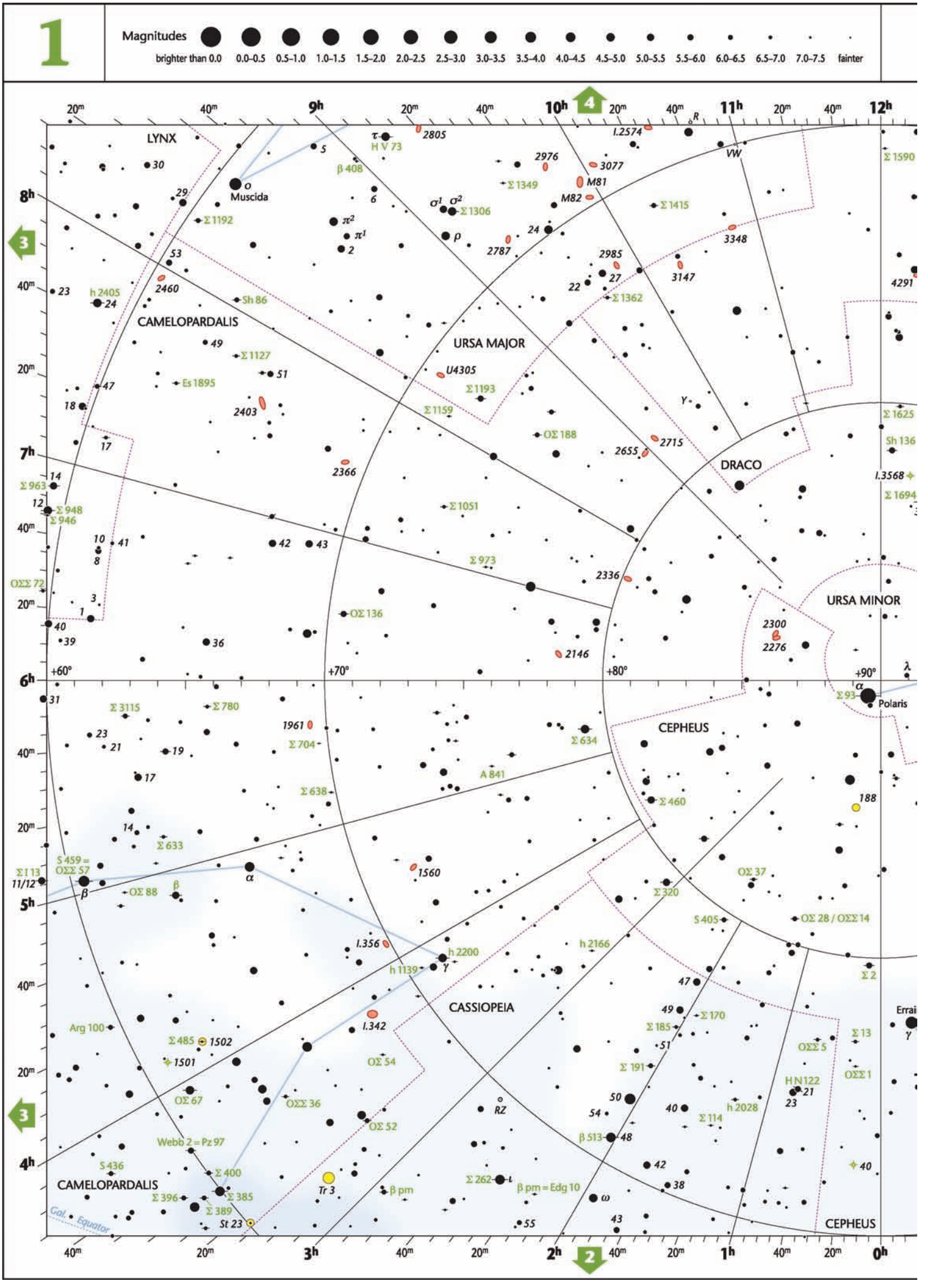
It has been a sincere pleasure working on this project from its very inception with Vince Higgs, Commissioning Editor, Astronomy and Astrophysics, at Cambridge University Press. It was he who had the vision to see the need for this seminal new star atlas as proposed by author Mullaney, and he who obtained the endorsement of the Cambridge University Press editorial review board and management to undertake its publication. Acknowledgement is also due Laura Clark, Publishing Assistant, Physical Sciences, Lindsay Barnes, Editor, Physical Sciences, and Jonathan Ratcliffe, Production Editor, at Cambridge, for their roles in helping bring this work to press. Wil Tirion wants to thank James (Jim) Mullaney for his valuable input in this project. Without his expertise on the subject, and his great practical experience in observing double stars, it would not have been possible to create this *Atlas*. For James Mullaney, it has been a great honor and rare privilege to work closely with the famed and immensely talented Wil Tirion, creator of many legendary previous star atlases and who is without question the greatest mapper of the starry heavens the world has ever known. This collaboration has resulted in a truly unique new work in the field of astronomy that is sure to be actively used and endorsed by double star observers worldwide.

STAR CHARTS

CHART INDEX
Northern hemisphere

CHART INDEX
Southern hemisphere

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Double stars · Variable stars · Open clusters · Globular clusters · Planetary nebulae · Diffuse nebulae · Dark nebulae · Galaxies

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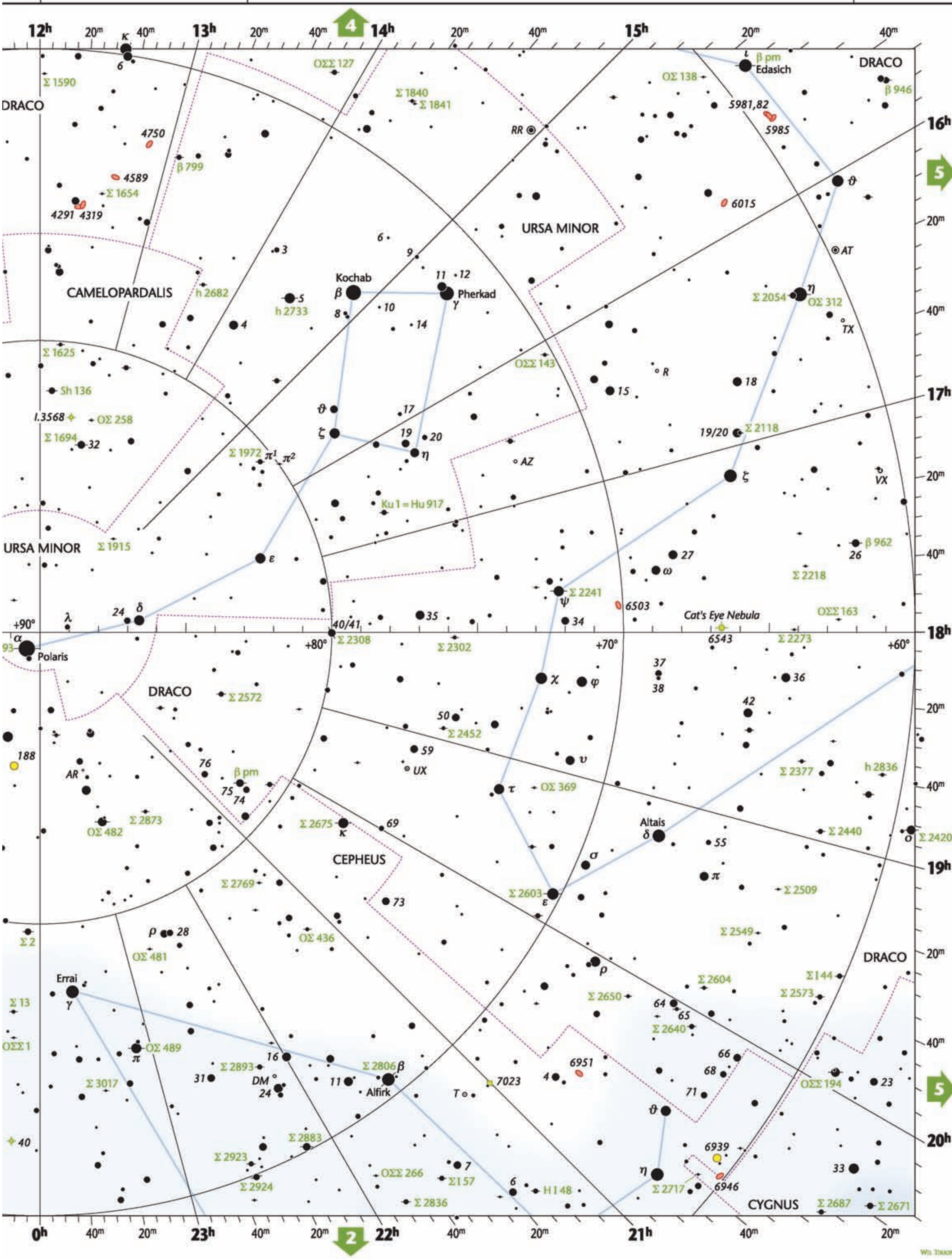

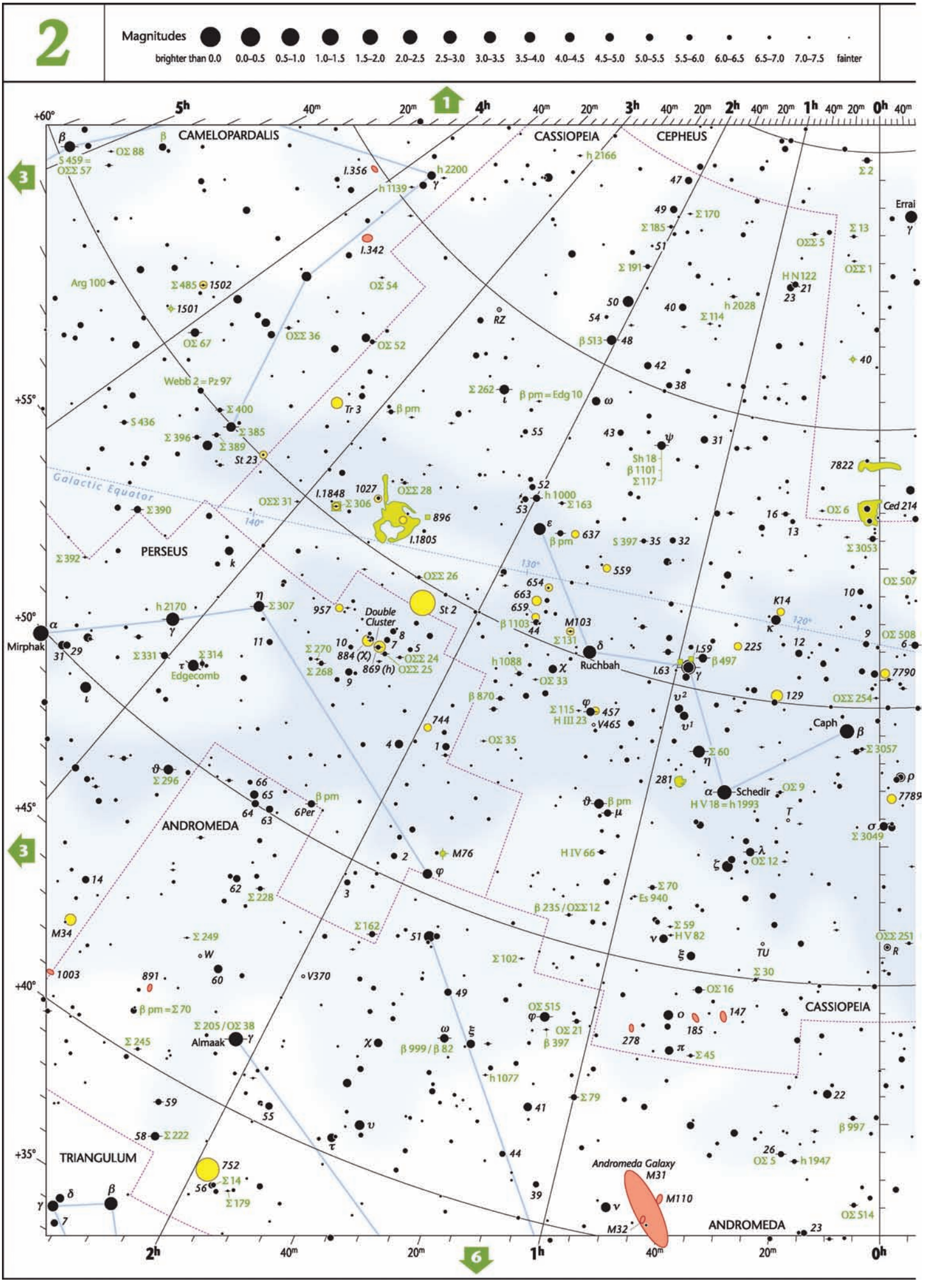
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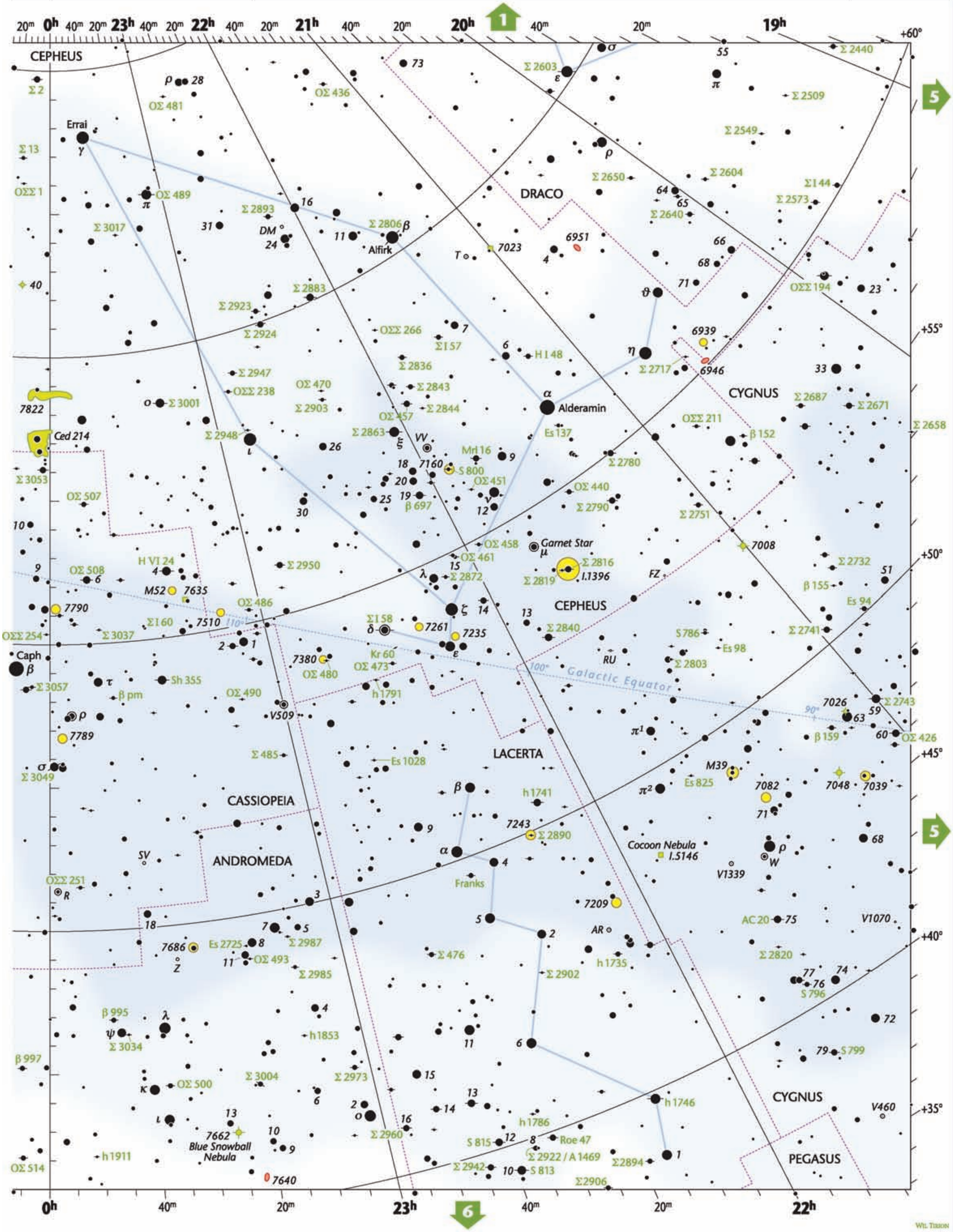

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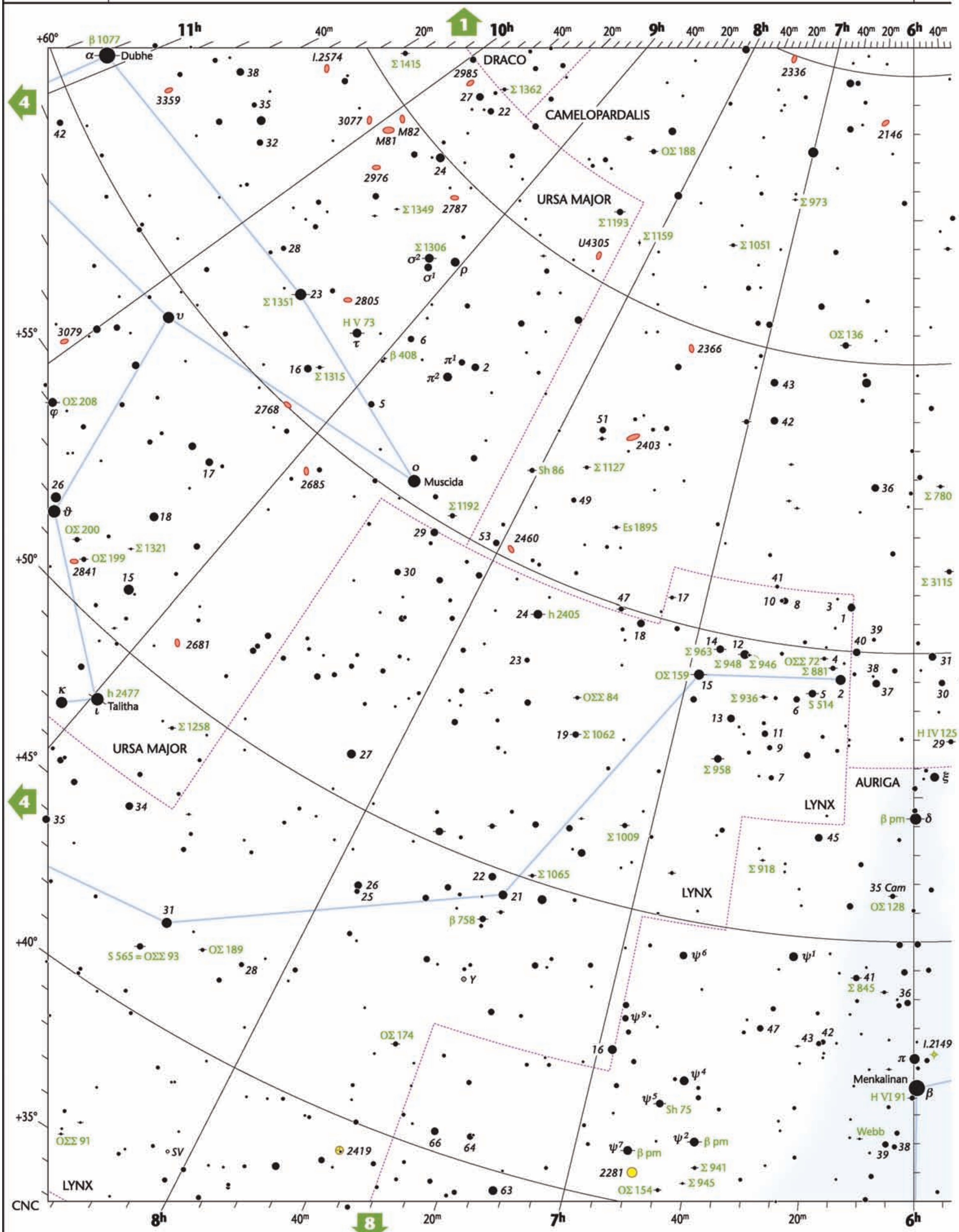

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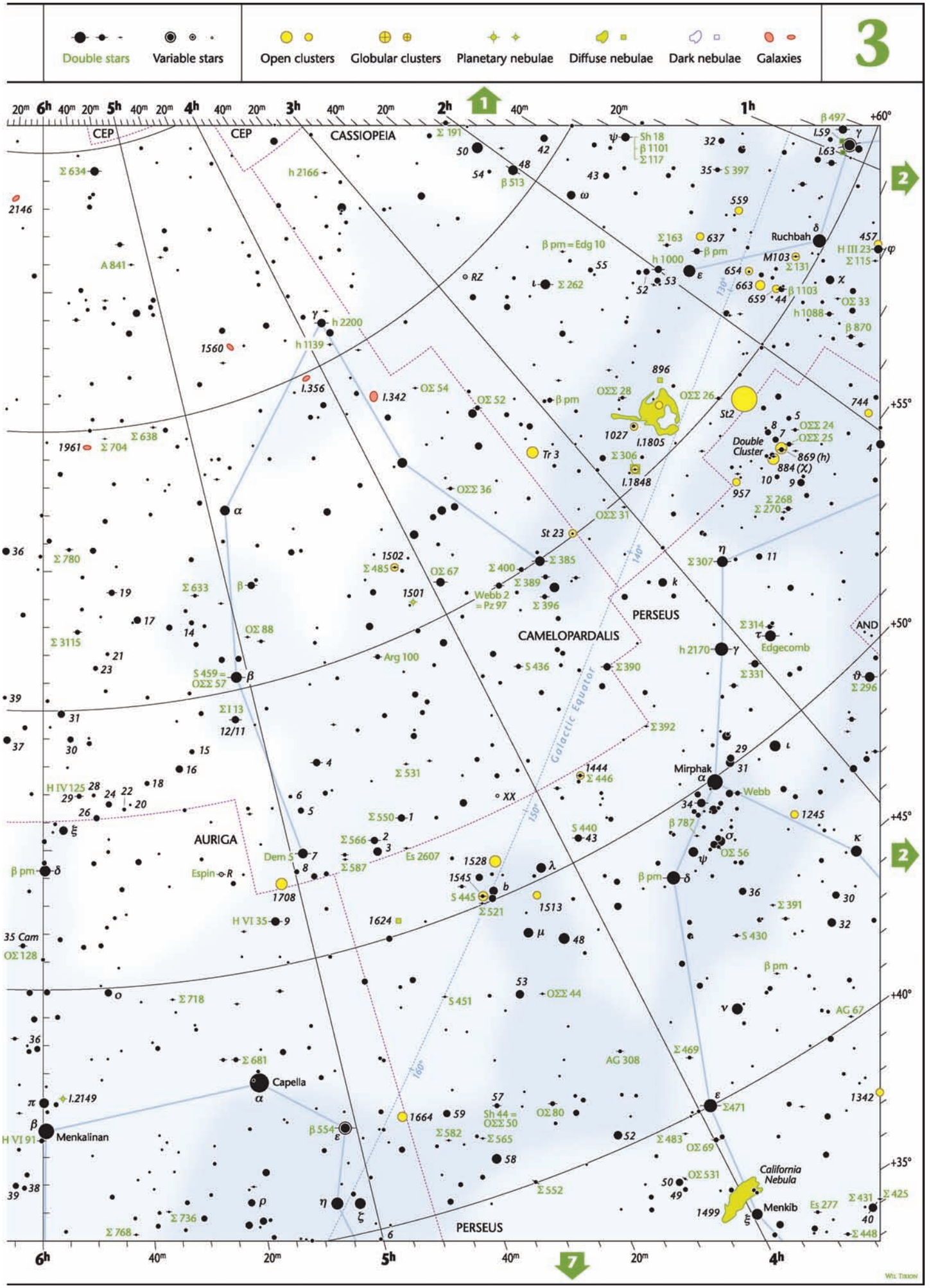
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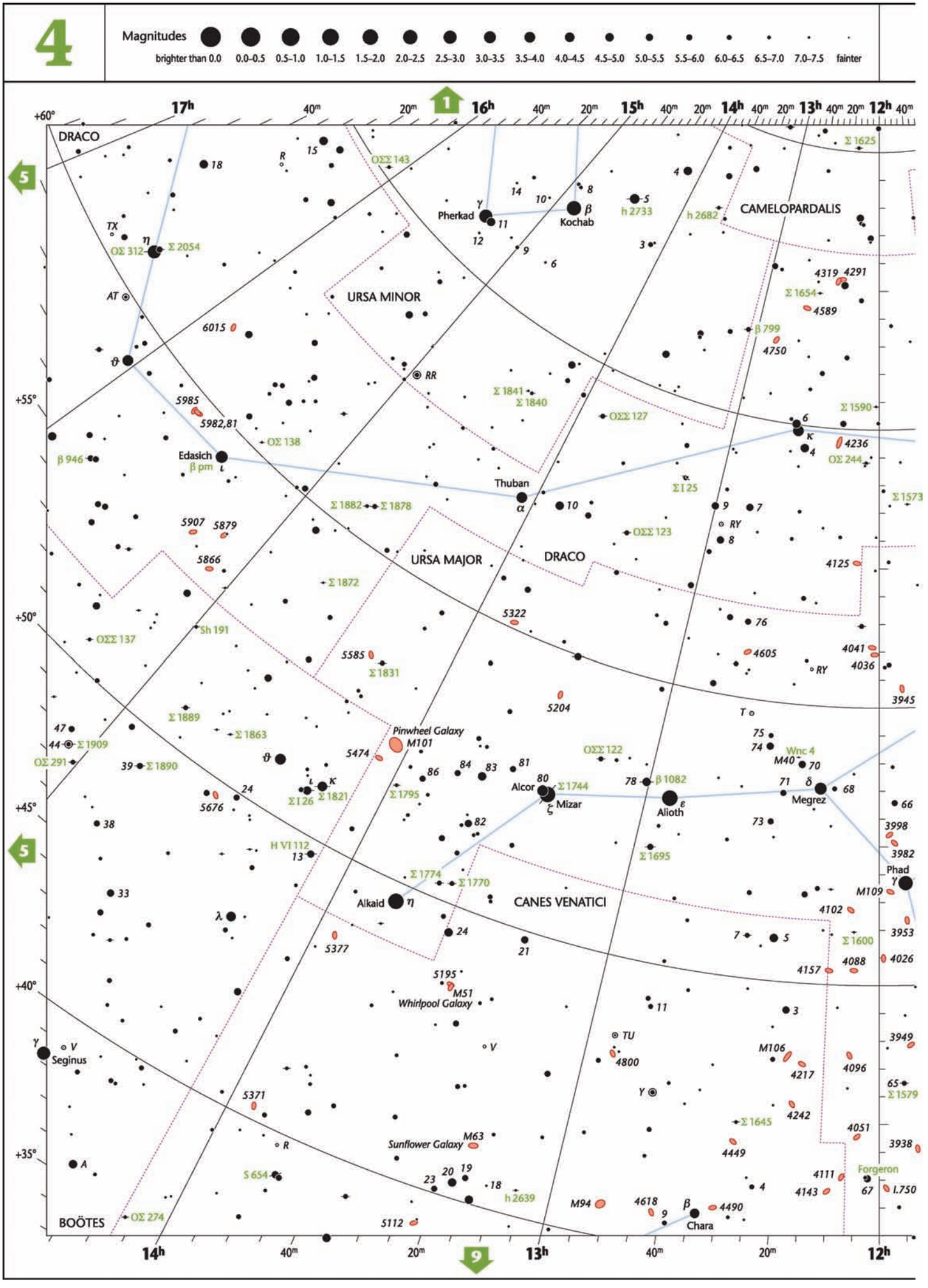
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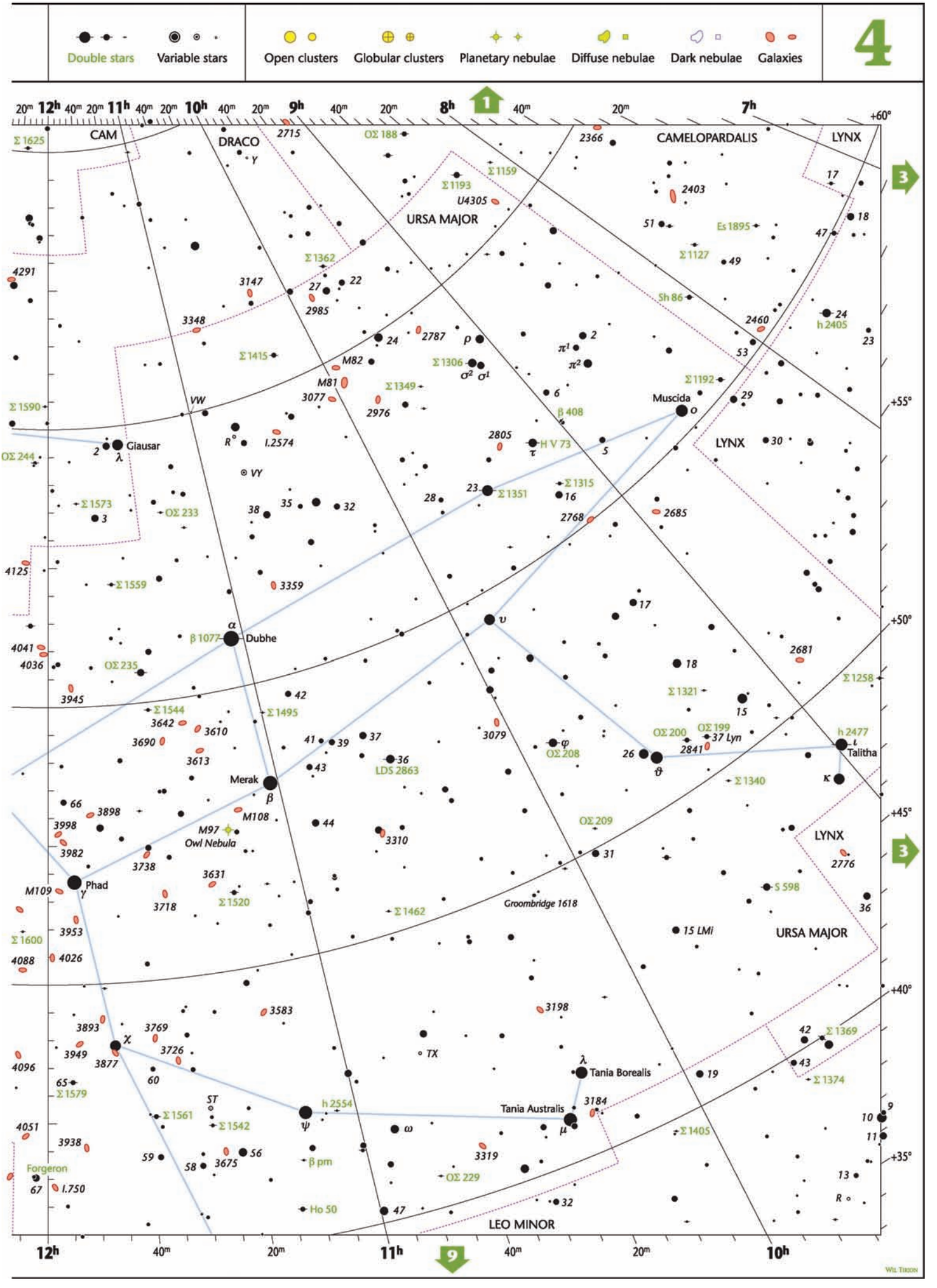
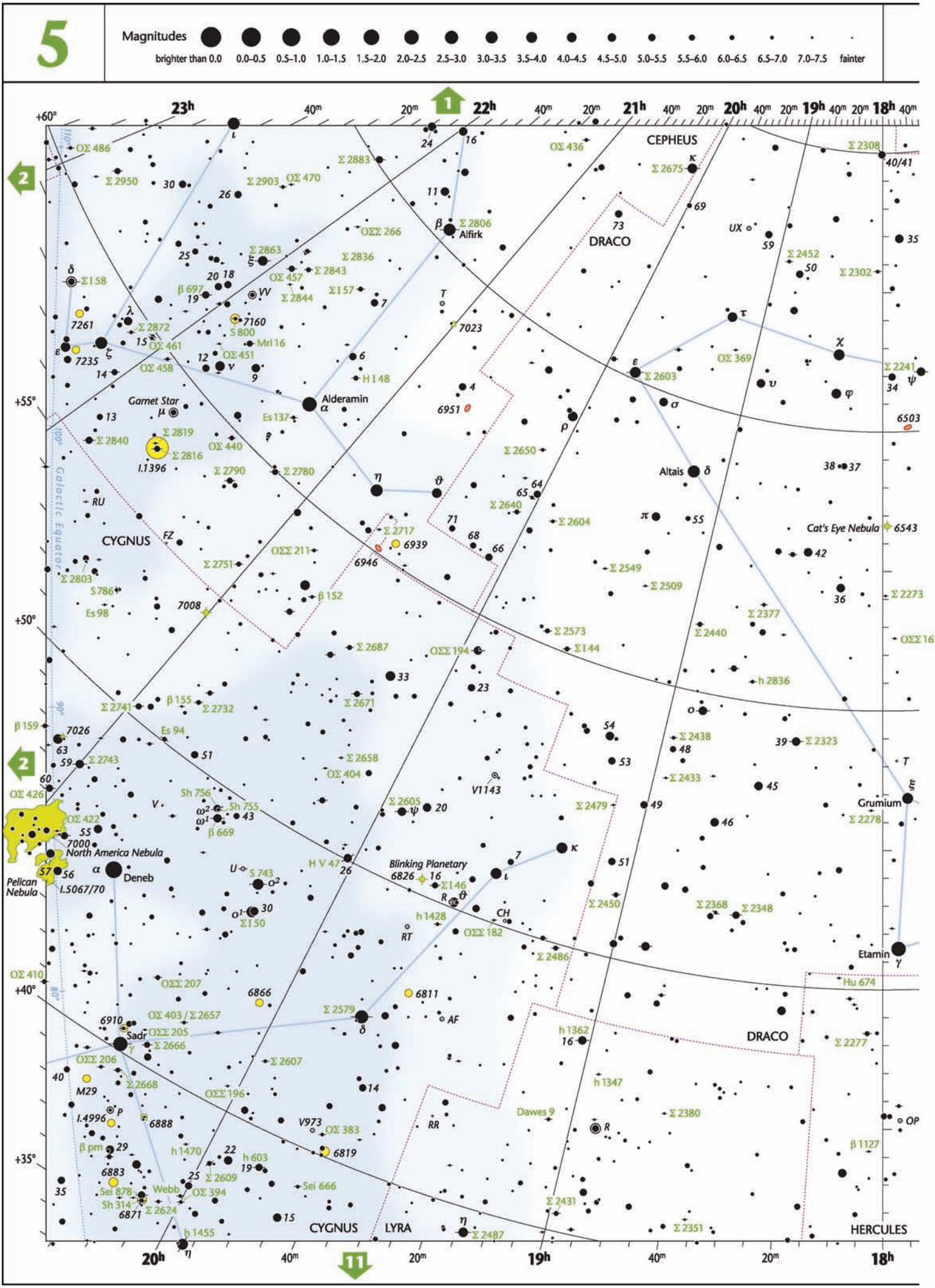
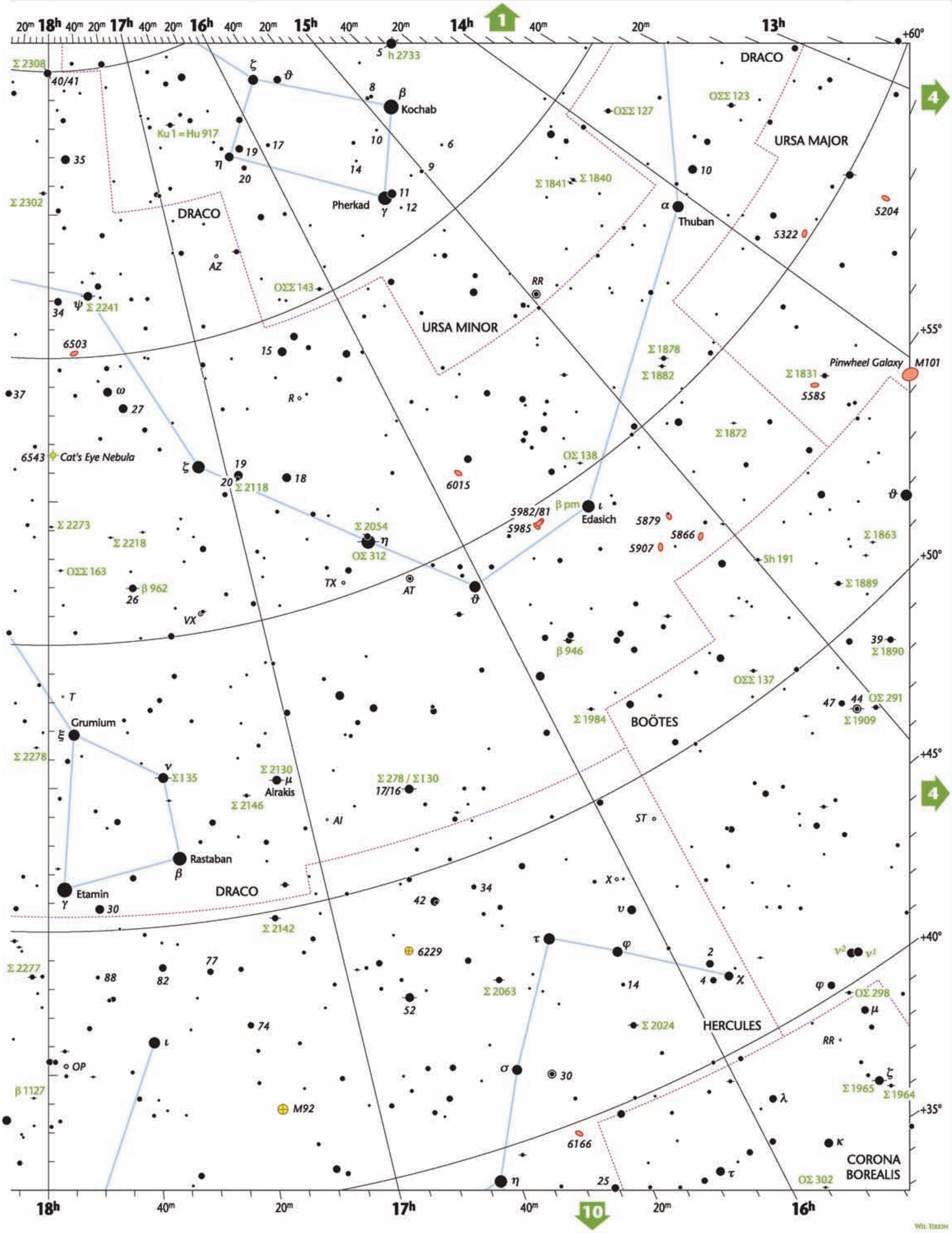
Σ 1889
Σ 1863
Σ 1909
OΣ 291
Σ 1890
Σ 126
Σ 1821
Σ 1795
Σ 1744
β 1082
Σ 1695
OΣ 122
H VI 112
Σ 1774
Σ 1770
Σ 1600
Σ 1645
Σ 1579
OΣ 274
S 654
5
1
9


Double stars
Variable stars
Open clusters
Globular clusters
Planetary nebulae
Diffuse nebulae
Dark nebulae
Galaxies
4
CAM
DRACO
URSA MAJOR
CAMELOPARDALIS
LYNX
LEO MINOR
Giausar
Dubhe
Merak
Phad
Muscida
Talitha
Tania Borealis
Tania Australis
Forgeron
Owl Nebula
Groombridge 1618
M81
M82
M97
M108
M109
VW
VY
TX
ST
15 LMi
20m 12h 40m 20m 11h 40m 20m 10h 40m 20m 9h 40m 20m 8h 40m 20m 7h
+60°
+55°
+50°
+45°
+40°
+35°
12h 40m 20m 11h 40m 20m 10h
1
3
3
9
Wil Tirion

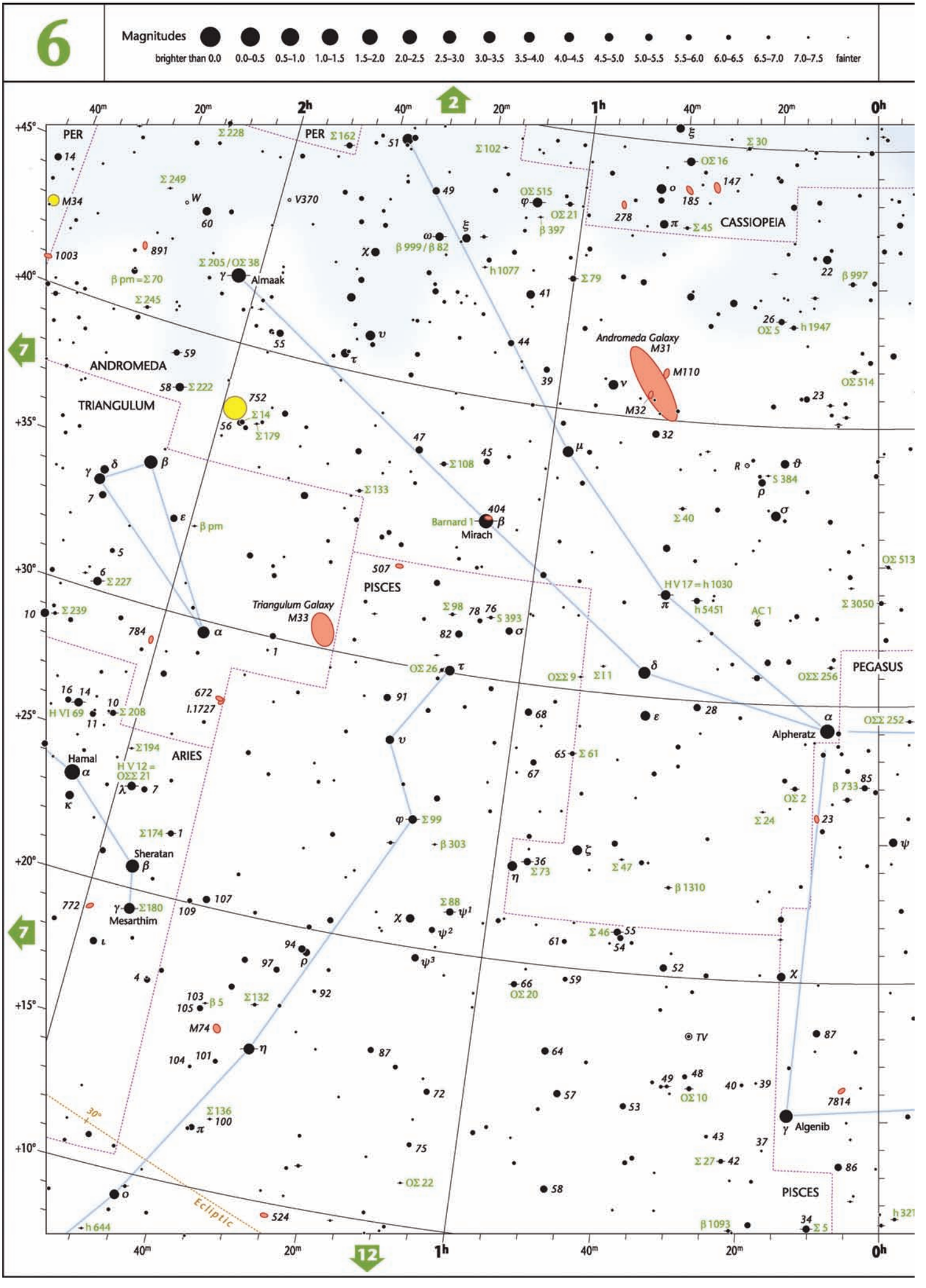

5
Magnitudes
brighter than 0.0
0.0–0.5
0.5–1.0
1.0–1.5
1.5–2.0
2.0–2.5
2.5–3.0
3.0–3.5
3.5–4.0
4.0–4.5
4.5–5.0
5.0–5.5
5.5–6.0
6.0–6.5
6.5–7.0
7.0–7.5
fainter
CEPHEUS
DRACO
CYGNUS
LYRA
HERCULES
Alderamin
Alfirk
Altais
Deneb
Sadr
Garnet Star
North America Nebula
Pelican Nebula
Blinking Planetary
Cat's Eye Nebula
Grumium
Etamin
Dawes 9
Webb
Galactic Equator
+60°
+55°
+50°
+40°
+35°
23h
22h
21h
20h
19h
18h
1
2
11

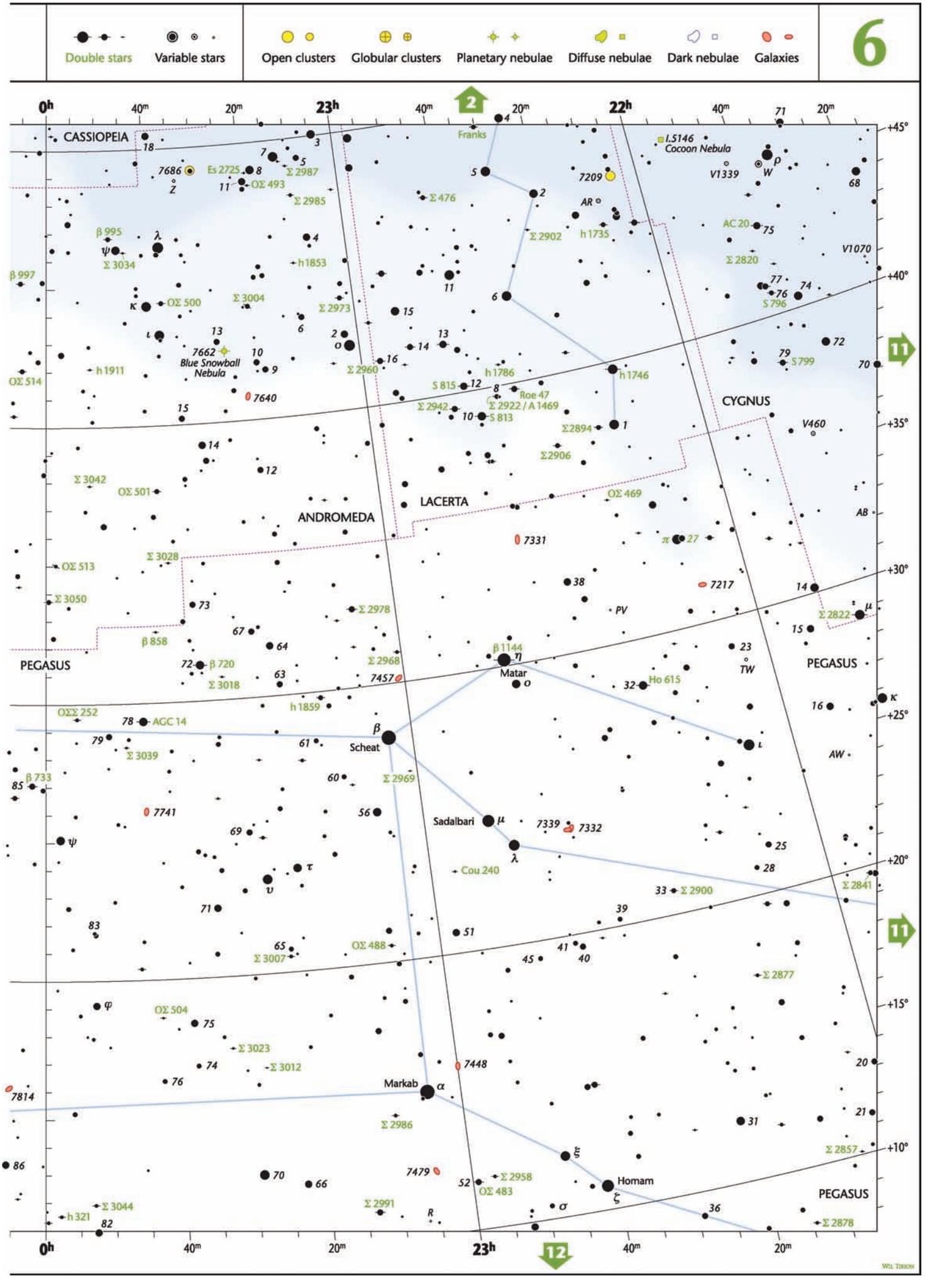
5

Double stars | Variable stars | Open clusters | Globular clusters | Planetary nebulae | Diffuse nebulae | Dark nebulae | Galaxies



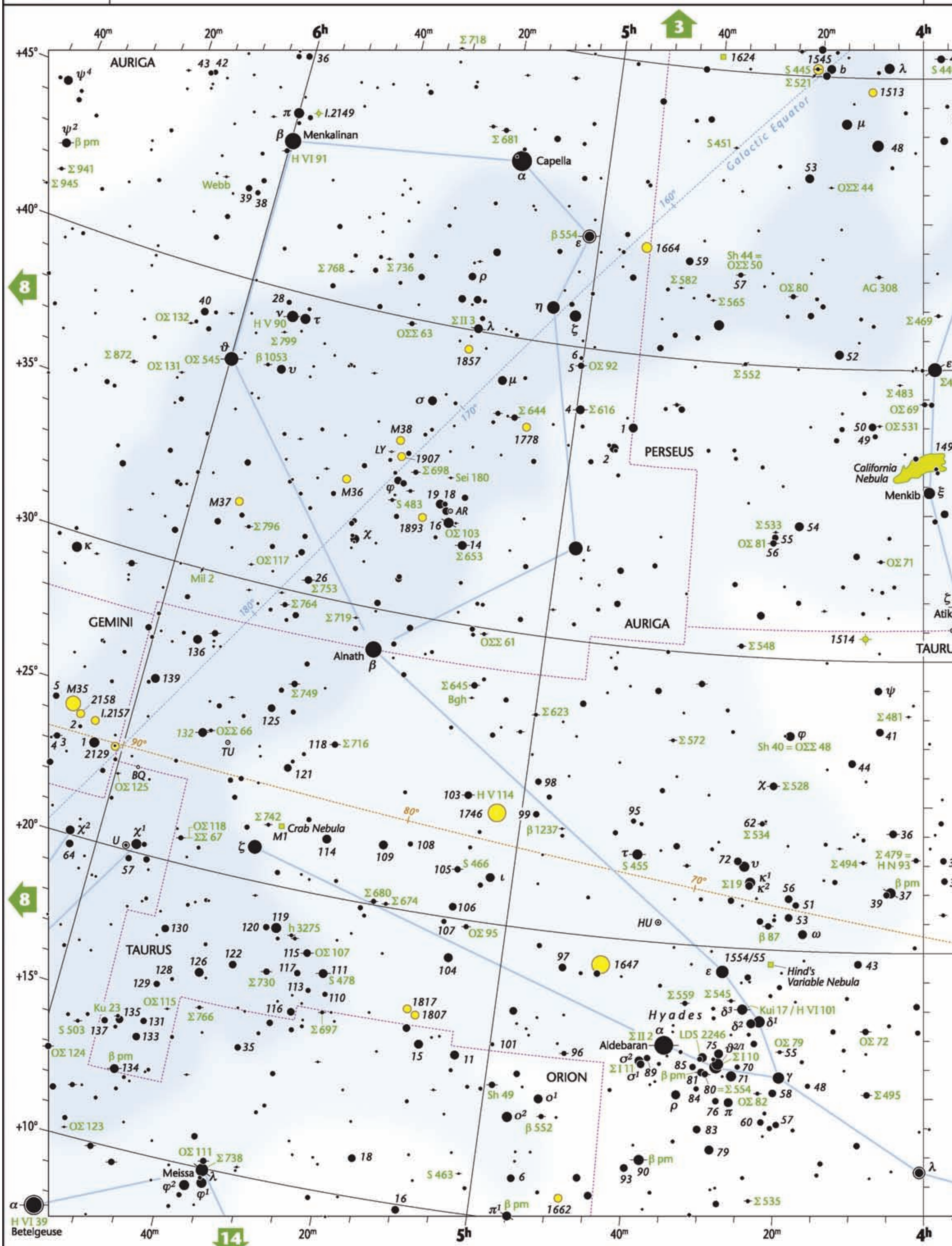
18h
17h
16h
15h
14h
13h
20m
40m
+60°
+55°
+50°
+45°
+40°
+35°
1
4
10
DRACO
URSA MINOR
URSA MAJOR
BOÖTES
HERCULES
CORONA BOREALIS
Kochab
Pherkad
Thuban
Edasich
Grumium
Rastaban
Etamin
Alrakis
Pinwheel Galaxy
M101
Cat's Eye Nebula
6543
6503
6015
5982/81
5985
5879
5866
5907
5322
5204
5585
6229
M92
6166
h 2733
Ku 1 = Hu 917
OΣΣ 127
OΣΣ 123
OΣΣ 143
OΣΣ 163
OΣΣ 137
Σ 2308
Σ 2302
Σ 2241
Σ 1841
Σ 1840
Σ 1878
Σ 1882
Σ 1831
Σ 1872
OΣ 138
β pm
Σ 2118
Σ 2054
OΣ 312
Σ 2273
Σ 2218
β 962
β 946
Sh 191
Σ 1863
Σ 1889
Σ 1890
Σ 1909
OΣ 291
Σ 1984
Σ 2278
Σ 135
Σ 2130
Σ 2146
Σ 278 / Σ 130
Σ 2142
Σ 2277
Σ 2063
Σ 2024
OΣ 298
β 1127
Σ 1965
Σ 1964
OΣ 302
AZ
RR
R
TX
AT
VX
T
AI
ST
X
OP
WIL TIRION

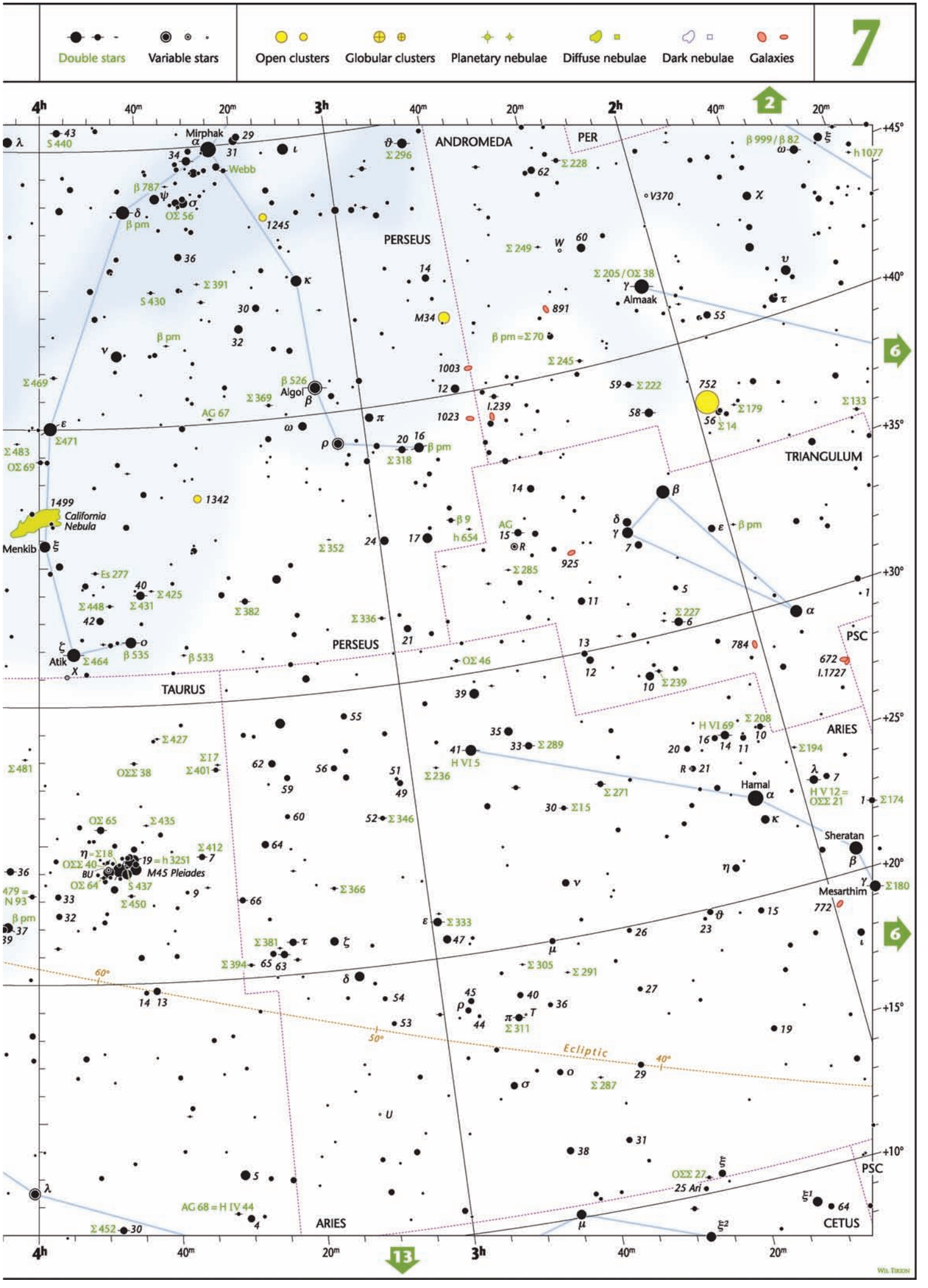

6
Magnitudes
brighter than 0.0
0.0–0.5
0.5–1.0
1.0–1.5
1.5–2.0
2.0–2.5
2.5–3.0
3.0–3.5
3.5–4.0
4.0–4.5
4.5–5.0
5.0–5.5
5.5–6.0
6.0–6.5
6.5–7.0
7.0–7.5
fainter
40m
20m
2h
40m
20m
1h
40m
20m
0h
+45°
+40°
+35°
+30°
+25°
+20°
+15°
+10°
2
7
7
12
PER
PER
CASSIOPEIA
ANDROMEDA
TRIANGULUM
PISCES
ARIES
PISCES
PEGASUS
Almaak
Mirach
Alpheratz
Hamal
Sheratan
Mesarthim
Algenib
Andromeda Galaxy
M31
M110
M32
Triangulum Galaxy
M33
Barnard 1
M34
M74
TV
Ecliptic
30°


Double stars
Variable stars
Open clusters
Globular clusters
Planetary nebulae
Diffuse nebulae
Dark nebulae
Galaxies
6
CASSIOPEIA
ANDROMEDA
LACERTA
CYGNUS
PEGASUS
Blue Snowball Nebula
Cocoon Nebula
Franks
Matar
Scheat
Sadalbari
Markab
Homam
0h
40m
20m
23h
22h
71
+45°
+40°
+35°
+30°
+25°
+20°
+15°
+10°
11
12

7

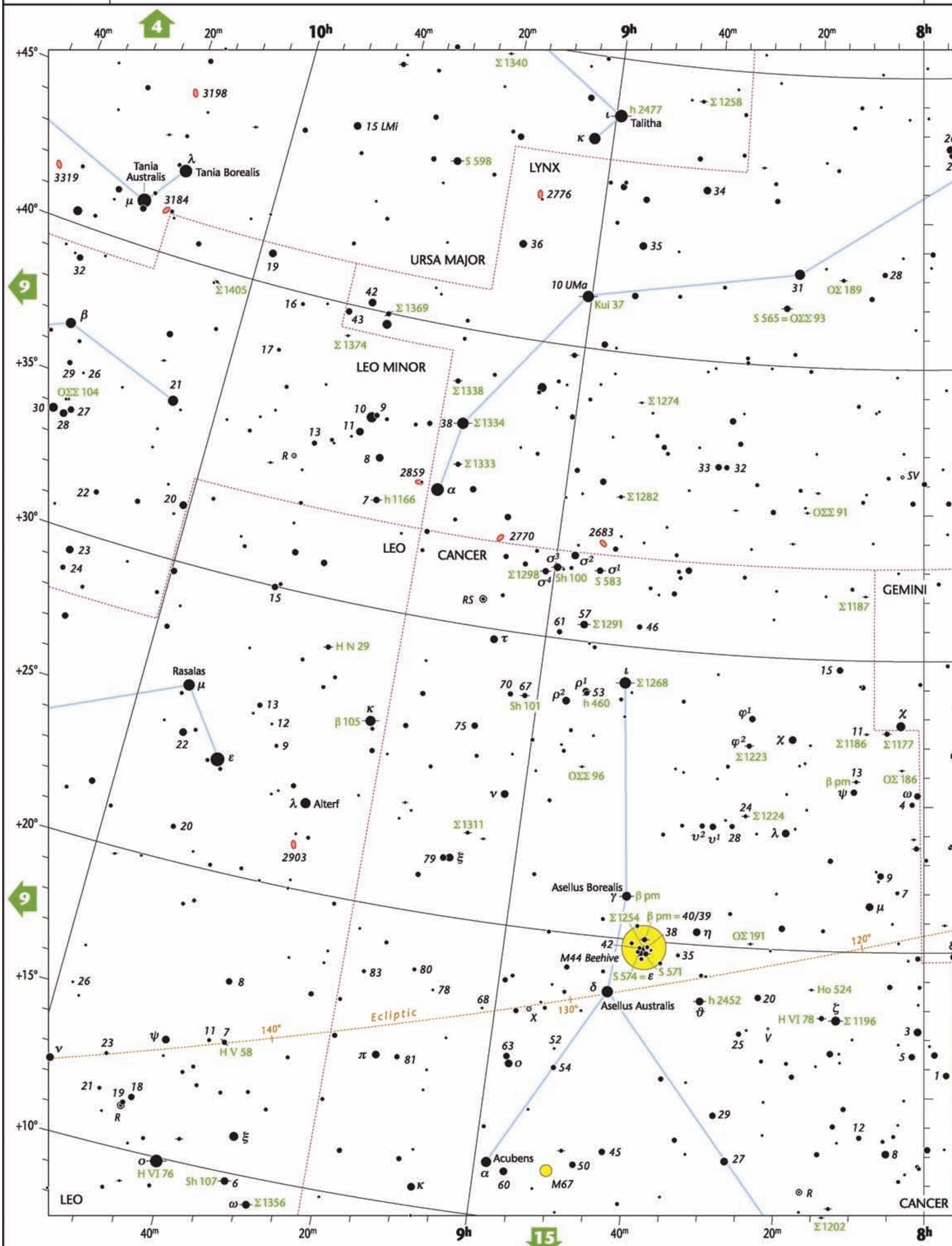
Magnitudes																
brighter than 0.0	0.0–0.5	0.5–1.0	1.0–1.5	1.5–2.0	2.0–2.5	2.5–3.0	3.0–3.5	3.5–4.0	4.0–4.5	4.5–5.0	5.0–5.5	5.5–6.0	6.0–6.5	6.5–7.0	7.0–7.5	fainter



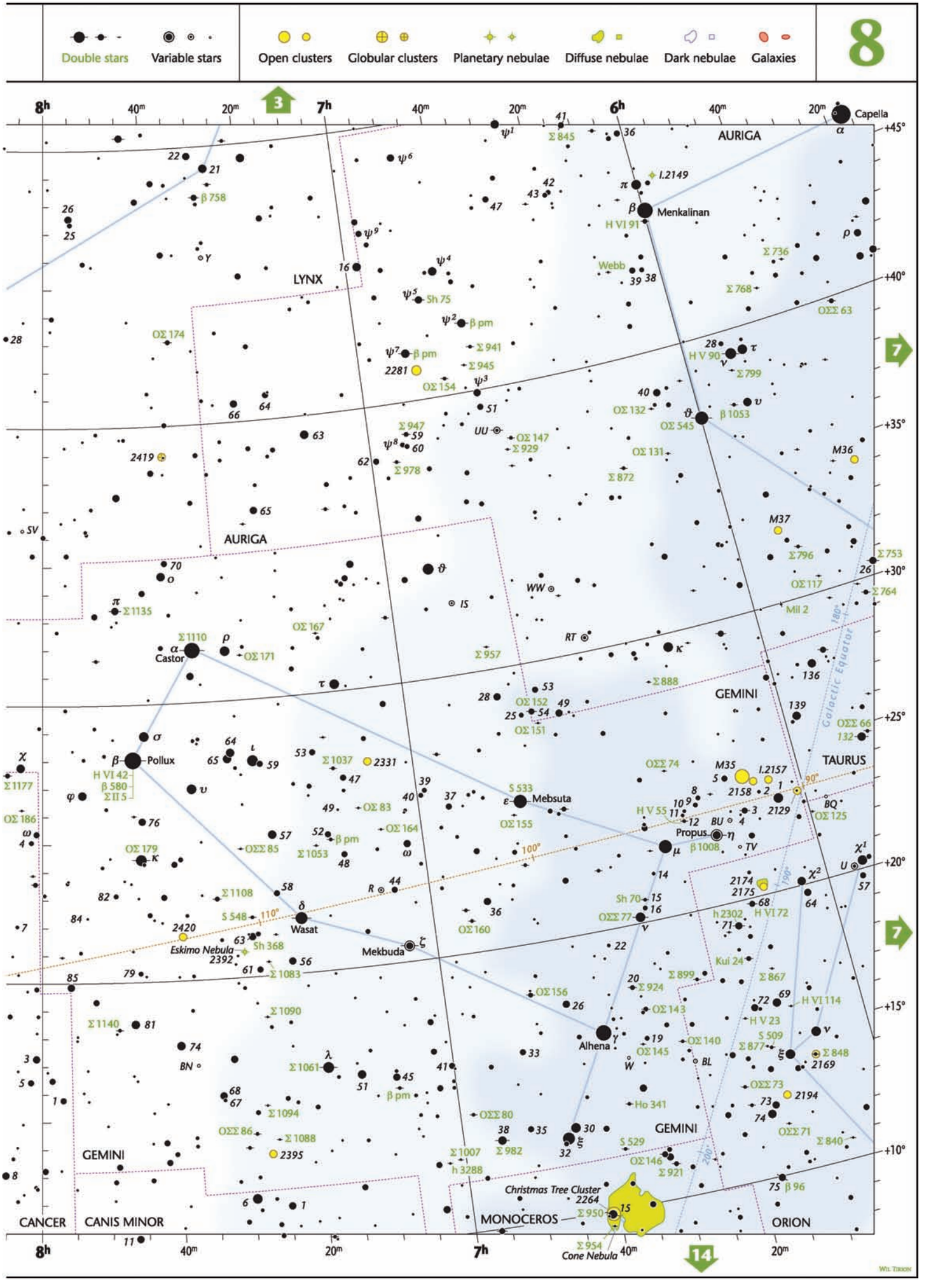

Double stars
Variable stars
Open clusters
Globular clusters
Planetary nebulae
Diffuse nebulae
Dark nebulae
Galaxies
7
ANDROMEDA
PER
PERSEUS
TRIANGULUM
PSC
TAURUS
ARIES
CETUS
Mirphak
Webb
Algol
Almaak
Menkib
Atik
Harnal
Sheratan
Mesarthim
M45 Pleiades
California Nebula
Ecliptic
60°
50°
40°
4h
40m
20m
3h
2h
+45°
+40°
+35°
+30°
+25°
+20°
+15°
+10°

8

Magnitudes: brighter than 0.0 · 0.0–0.5 · 0.5–1.0 · 1.0–1.5 · 1.5–2.0 · 2.0–2.5 · 2.5–3.0 · 3.0–3.5 · 3.5–4.0 · 4.0–4.5 · 4.5–5.0 · 5.0–5.5 · 5.5–6.0 · 6.0–6.5 · 6.5–7.0 · 7.0–7.5 · fainter

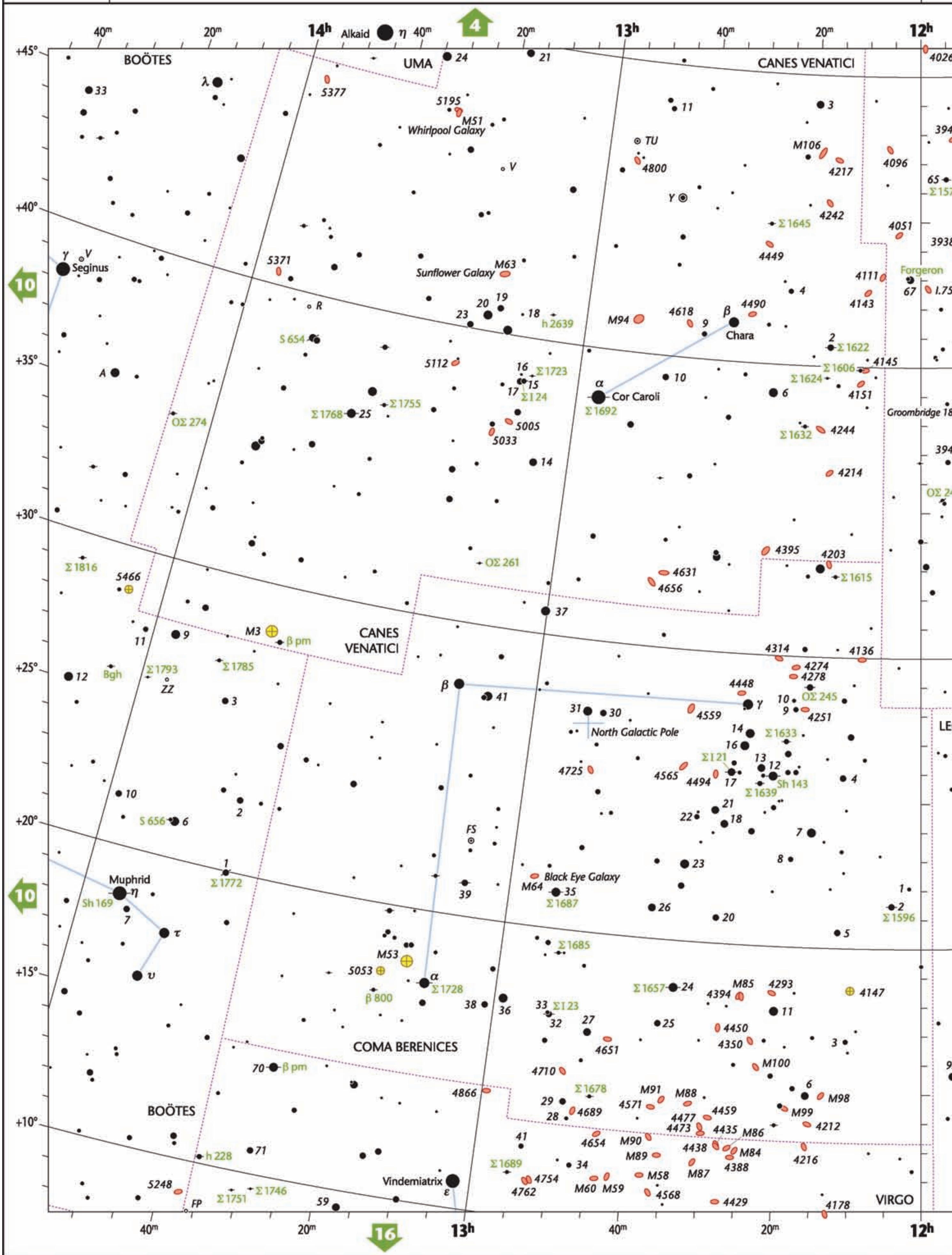


4
9
9
15
10h
9h
8h
40m
20m
+45°
+40°
+35°
+30°
+25°
+20°
+15°
+10°
URSA MAJOR
LYNX
LEO MINOR
LEO
CANCER
GEMINI
Tania Australis
Tania Borealis
Talitha
Rasalas
Alterf
Asellus Borealis
Asellus Australis
M44 Beehive
Acubens
M67
Ecliptic
140°
130°
120°
3198
3319
3184
2776
2859
2770
2683
2903
Σ 1340
h 2477
Σ 1258
15 LMi
S 598
Σ 1405
Σ 1369
Σ 1374
10 UMa
Kui 37
OΣ 189
S 565 = OΣΣ 93
OΣΣ 104
Σ 1338
Σ 1334
Σ 1274
Σ 1333
h 1166
Σ 1282
OΣΣ 91
Σ 1298
Sh 100
S 583
Σ 1187
Σ 1291
H N 29
Σ 1268
Sh 101
h 460
β 105
OΣΣ 96
Σ 1223
Σ 1186
Σ 1177
β pm
OΣ 186
Σ 1224
Σ 1311
Σ 1254
β pm = 40/39
OΣ 191
S 574 = ε
S 571
h 2452
Ho 524
H VI 78
Σ 1196
H V 58
H VI 76
Sh 107
Σ 1356
Σ 1202
RS
SV
R
LEO
CANCER

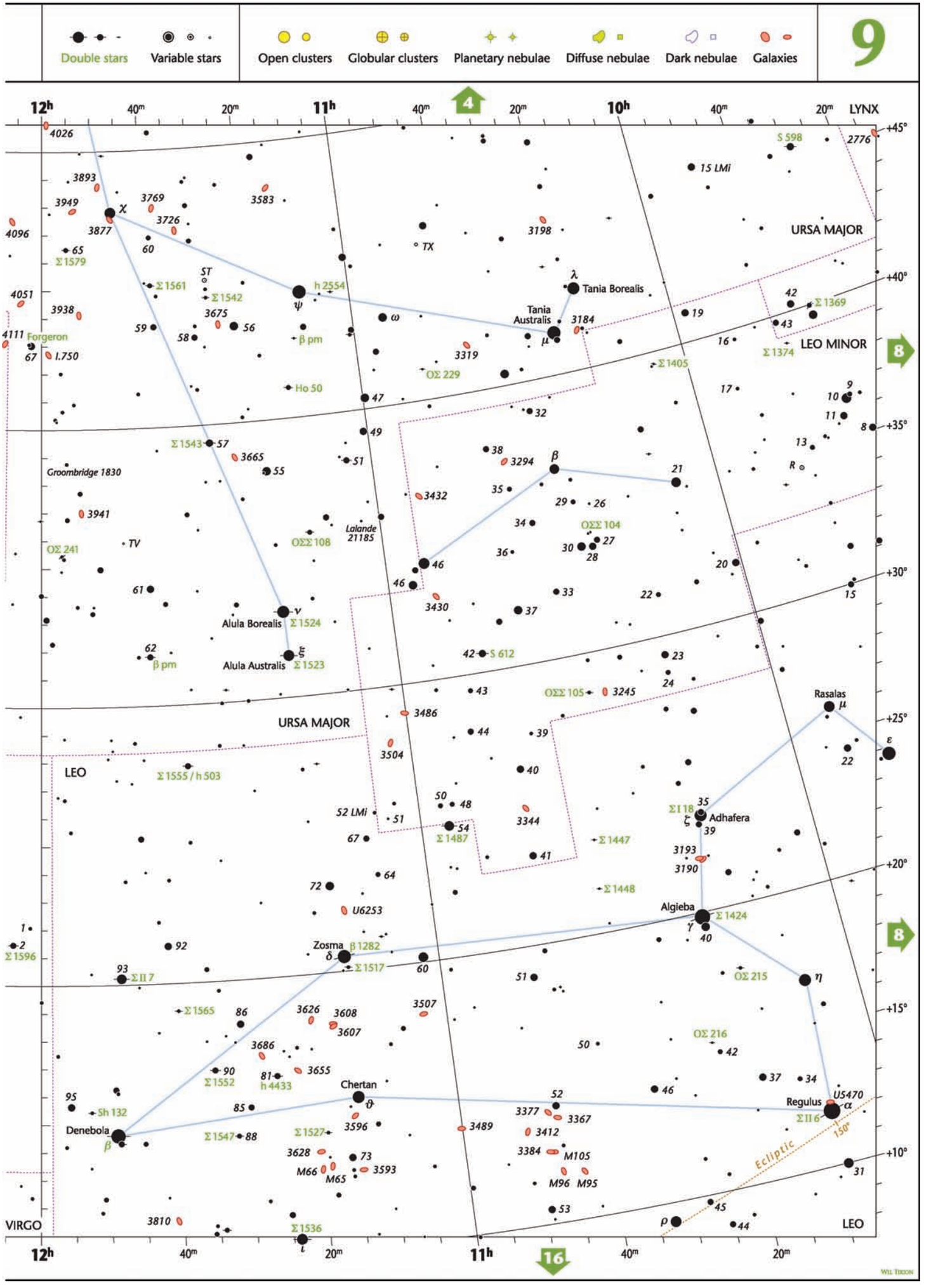

Double stars
Variable stars
Open clusters
Globular clusters
Planetary nebulae
Diffuse nebulae
Dark nebulae
Galaxies
8
AURIGA
LYNX
GEMINI
TAURUS
MONOCEROS
ORION
CANCER
CANIS MINOR
Capella
Menkalinan
Castor
Pollux
Wasat
Mekbuda
Mebsuta
Propus
Alhena
Eskimo Nebula
Christmas Tree Cluster
Cone Nebula
M36
M37
M35
Galactic Equator
Wil Tirion

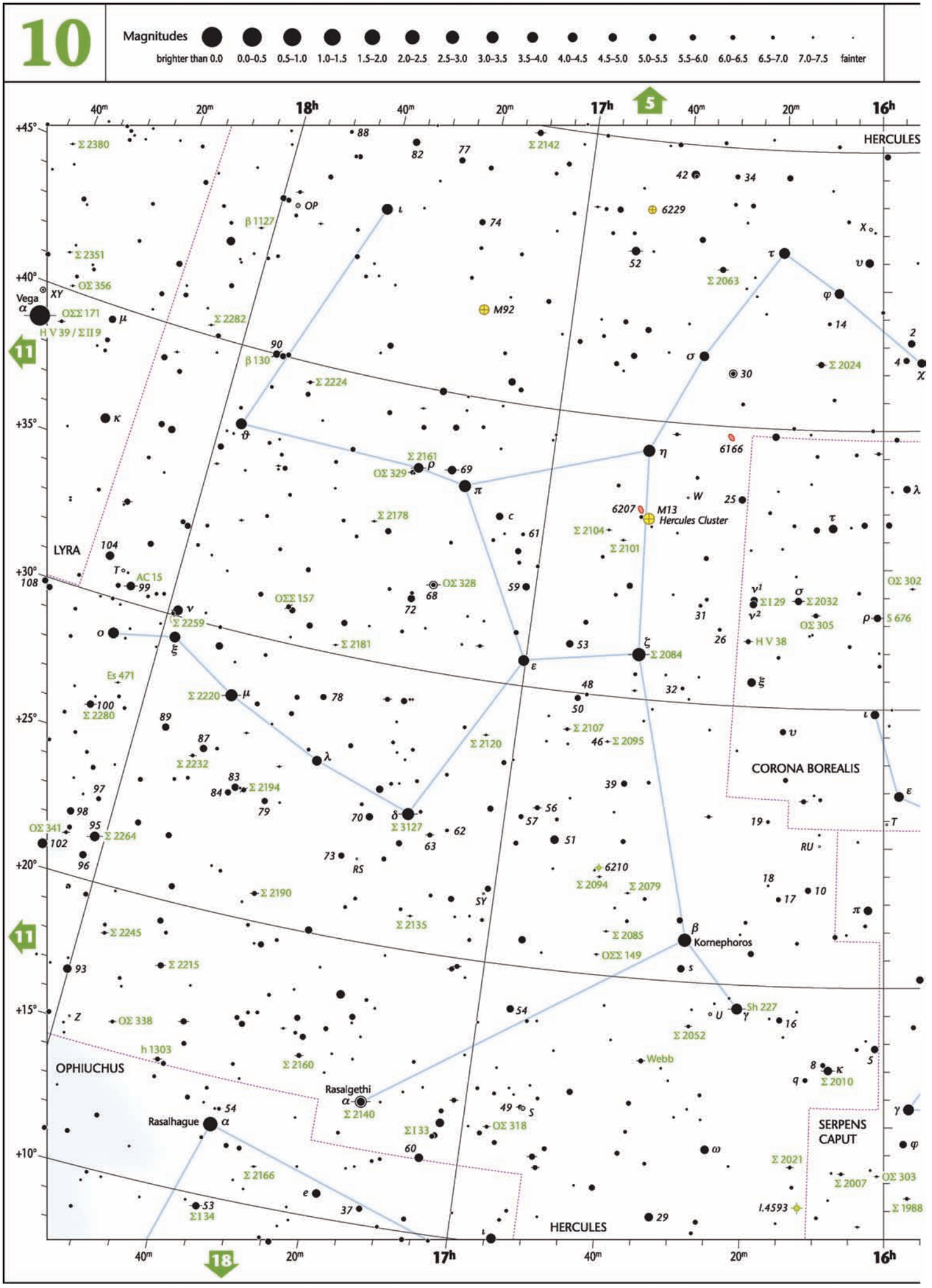
9

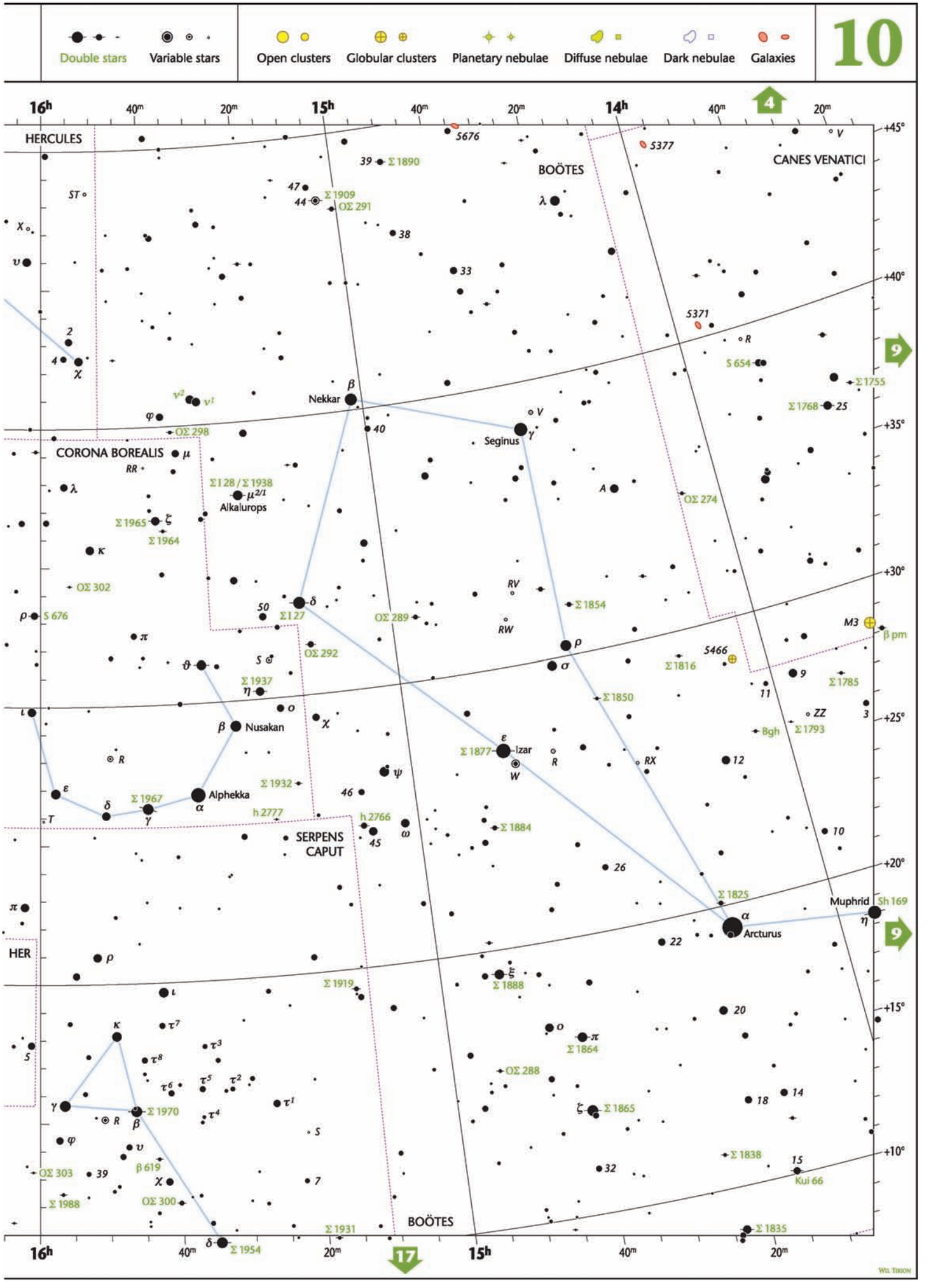
Magnitudes: brighter than 0.0 · 0.0–0.5 · 0.5–1.0 · 1.0–1.5 · 1.5–2.0 · 2.0–2.5 · 2.5–3.0 · 3.0–3.5 · 3.5–4.0 · 4.0–4.5 · 4.5–5.0 · 5.0–5.5 · 5.5–6.0 · 6.0–6.5 · 6.5–7.0 · 7.0–7.5 · fainter



4
10
10
16
14h
13h
12h
40m
20m
+45°
+40°
+35°
+30°
+25°
+20°
+15°
+10°
BOÖTES
UMA
CANES VENATICI
CANES VENATICI
COMA BERENICES
BOÖTES
VIRGO
LEO
Alkaid
Seginus
Chara
Cor Caroli
Muphrid
Vindemiatrix
M51
Whirlpool Galaxy
M63
Sunflower Galaxy
M94
M106
M3
M53
M64
Black Eye Galaxy
North Galactic Pole
Groombridge 1830
Forgeron
5377
5195
4800
4217
4242
4449
4096
4051
3949
3938
4026
5371
4618
4490
4111
4143
I.750
5112
5005
5033
4244
4214
4395
4203
4631
4656
5466
4314
4136
4274
4278
4448
4559
4251
4725
4565
4494
5053
4394
4293
4147
4450
4350
4651
M100
4710
4866
M91
M88
4459
M99
4212
M98
4689
4571
4477
4473
4435
M86
4654
M90
4438
M84
M89
4388
4216
4754
4762
M60
M59
M58
M87
4568
4429
4178
5248
Σ 1645
Σ 1579
Σ 1622
Σ 1606
Σ 1624
Σ 1723
Σ I 24
Σ 1755
Σ 1768
Σ 1692
Σ 1632
OΣ 274
OΣ 241
OΣ 261
Σ 1615
Σ 1816
Σ 1793
Σ 1785
Bgh
OΣ 245
Σ 1633
Σ I 21
Σ 1639
Sh 143
S 654
h 2639
S 656
Σ 1772
Sh 169
Σ 1687
Σ 1685
Σ 1657
Σ 1596
Σ 1728
β 800
Σ I 23
Σ 1678
Σ 1689
h 228
Σ 1751
Σ 1746
β pm
TU
Y
V
R
ZZ
FS
FP


Double stars
Variable stars
Open clusters
Globular clusters
Planetary nebulae
Diffuse nebulae
Dark nebulae
Galaxies
9
12h
40m
20m
11h
40m
20m
10h
40m
20m
LYNX
URSA MAJOR
LEO MINOR
LEO
VIRGO
Tania Borealis
Tania Australis
Alula Borealis
Alula Australis
Groombridge 1830
Lalande 21185
Forgeron
Rasalas
Adhafera
Algieba
Zosma
Chertan
Denebola
Regulus
Ecliptic
+45°
+40°
+35°
+30°
+25°
+20°
+15°
+10°
4
8
8
16

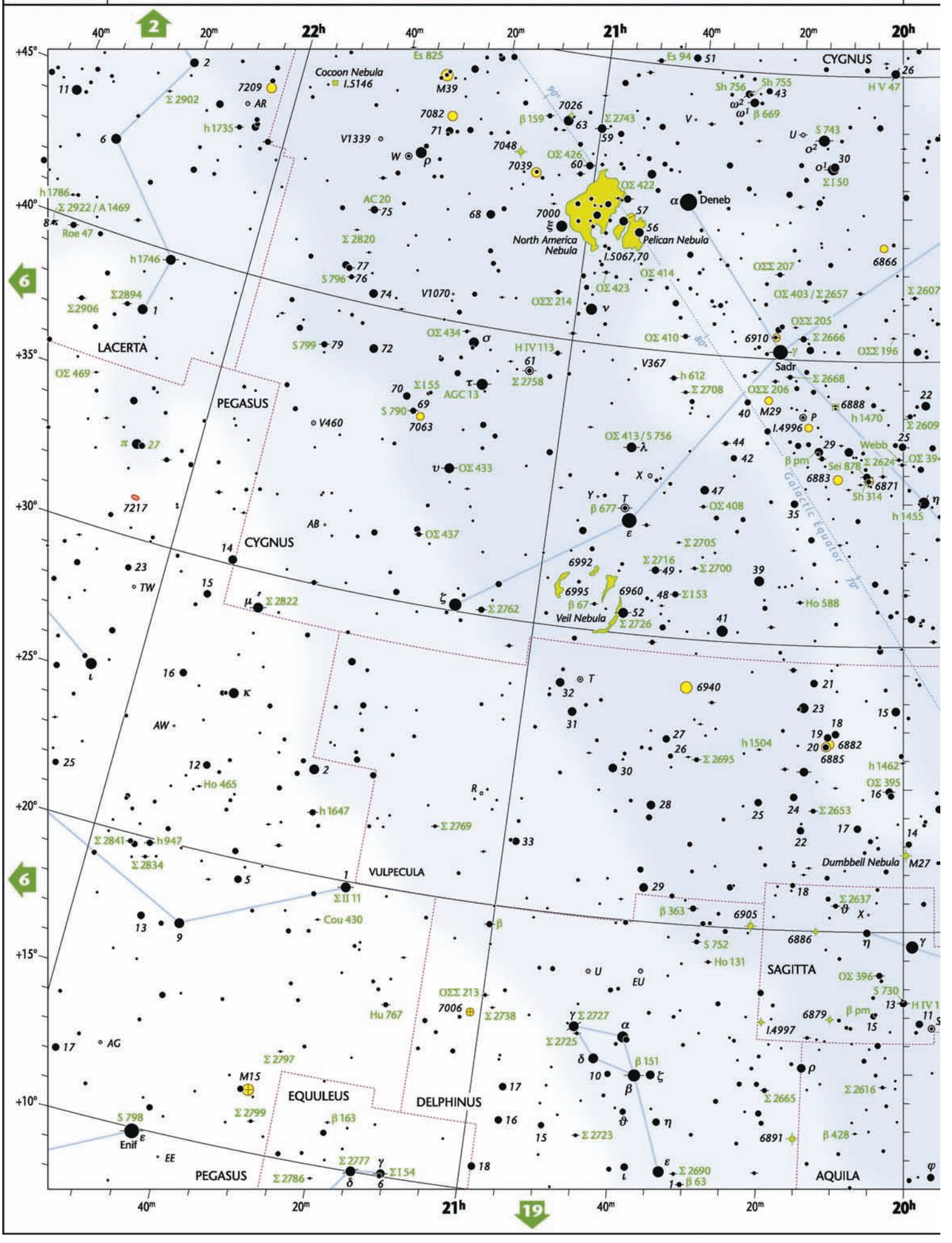

10
Magnitudes
brighter than 0.0
0.0–0.5
0.5–1.0
1.0–1.5
1.5–2.0
2.0–2.5
2.5–3.0
3.0–3.5
3.5–4.0
4.0–4.5
4.5–5.0
5.0–5.5
5.5–6.0
6.0–6.5
6.5–7.0
7.0–7.5
fainter
40m
20m
18h
40m
20m
17h
40m
20m
16h
5
11
11
18
+45°
+40°
+35°
+30°
+25°
+20°
+15°
+10°
HERCULES
LYRA
CORONA BOREALIS
OPHIUCHUS
SERPENS CAPUT
HERCULES
Vega
Rasalhague
Rasalgethi
Kornephoros
M13
Hercules Cluster
M92
Webb
Σ 2380
Σ 2142
Σ 2351
OΣ 356
HV 39 / ΣII 9
OΣΣ 171
Σ 2282
β 1127
β 130
Σ 2224
Σ 2161
OΣ 329
Σ 2178
Σ 2104
Σ 2101
Σ 2063
Σ 2024
6229
6166
6207
Σ 2259
OΣ 328
OΣΣ 157
Σ 2181
Σ 2084
Σ 2032
OΣ 302
OΣ 305
HV 38
Es 471
Σ 2220
Σ 2280
Σ 2107
Σ 2095
Σ 2120
Σ 2232
Σ 2194
Σ 3127
OΣ 341
Σ 2264
6210
Σ 2094
Σ 2079
Σ 2190
Σ 2135
Σ 2245
Σ 2215
Σ 2085
OΣΣ 149
Sh 227
Σ 2052
OΣ 338
h 1303
Σ 2160
Σ 2140
ΣI 33
OΣ 318
Σ 2166
ΣI 34
Σ 2010
Σ 2021
Σ 2007
OΣ 303
Σ 1988
I.4593
S 676

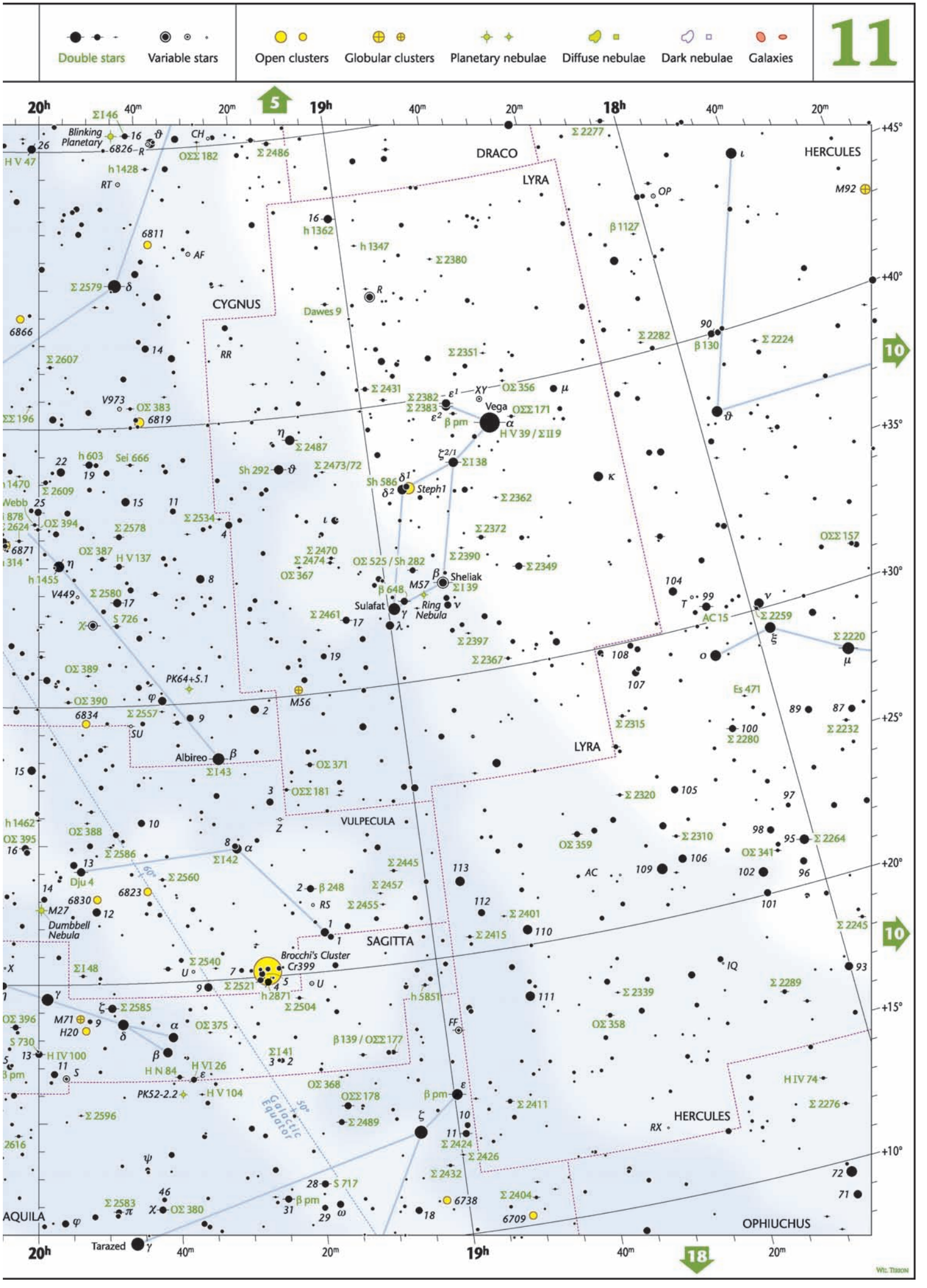

Double stars
Variable stars
Open clusters
Globular clusters
Planetary nebulae
Diffuse nebulae
Dark nebulae
Galaxies
10
16h
40m
20m
15h
40m
20m
14h
40m
20m
4
9
9
17
HERCULES
BOÖTES
CANES VENATICI
CORONA BOREALIS
SERPENS CAPUT
HER
BOÖTES
Nekkar
Seginus
Alkalurops
Nusakan
Alphekka
Izar
Arcturus
Muphrid
+45°
+40°
+35°
+30°
+25°
+20°
+15°
+10°
5676
5377
5371
5466
M3
Σ 1890
Σ 1909
OΣ 291
Σ 1755
Σ 1768
25
OΣ 298
OΣ 274
Σ I 28 / Σ 1938
Σ 1965
Σ 1964
OΣ 302
S 676
Σ I 27
OΣ 289
Σ 1854
OΣ 292
Σ 1816
Σ 1785
Σ 1937
Σ 1850
Σ 1793
Bgh
Σ 1877
Σ 1932
h 2777
h 2766
Σ 1884
Σ 1825
Σ 1919
Σ 1888
Σ 1864
OΣ 288
Σ 1865
Σ 1838
Kui 66
Σ 1970
OΣ 303
β 619
OΣ 300
Σ 1988
Σ 1954
Σ 1931
Σ 1835
Sh 169
β pm
Wil Tirion

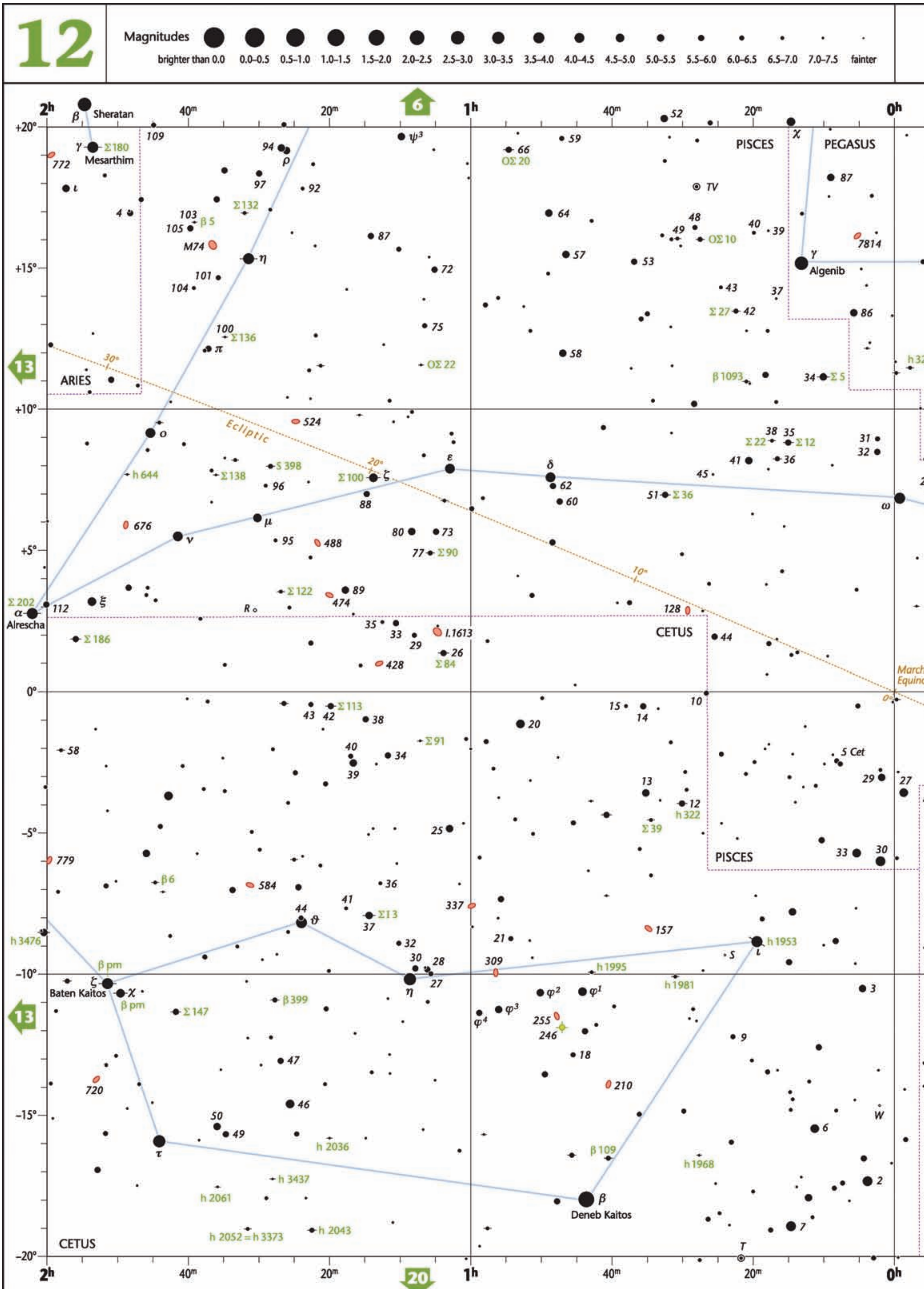
11

Magnitudes

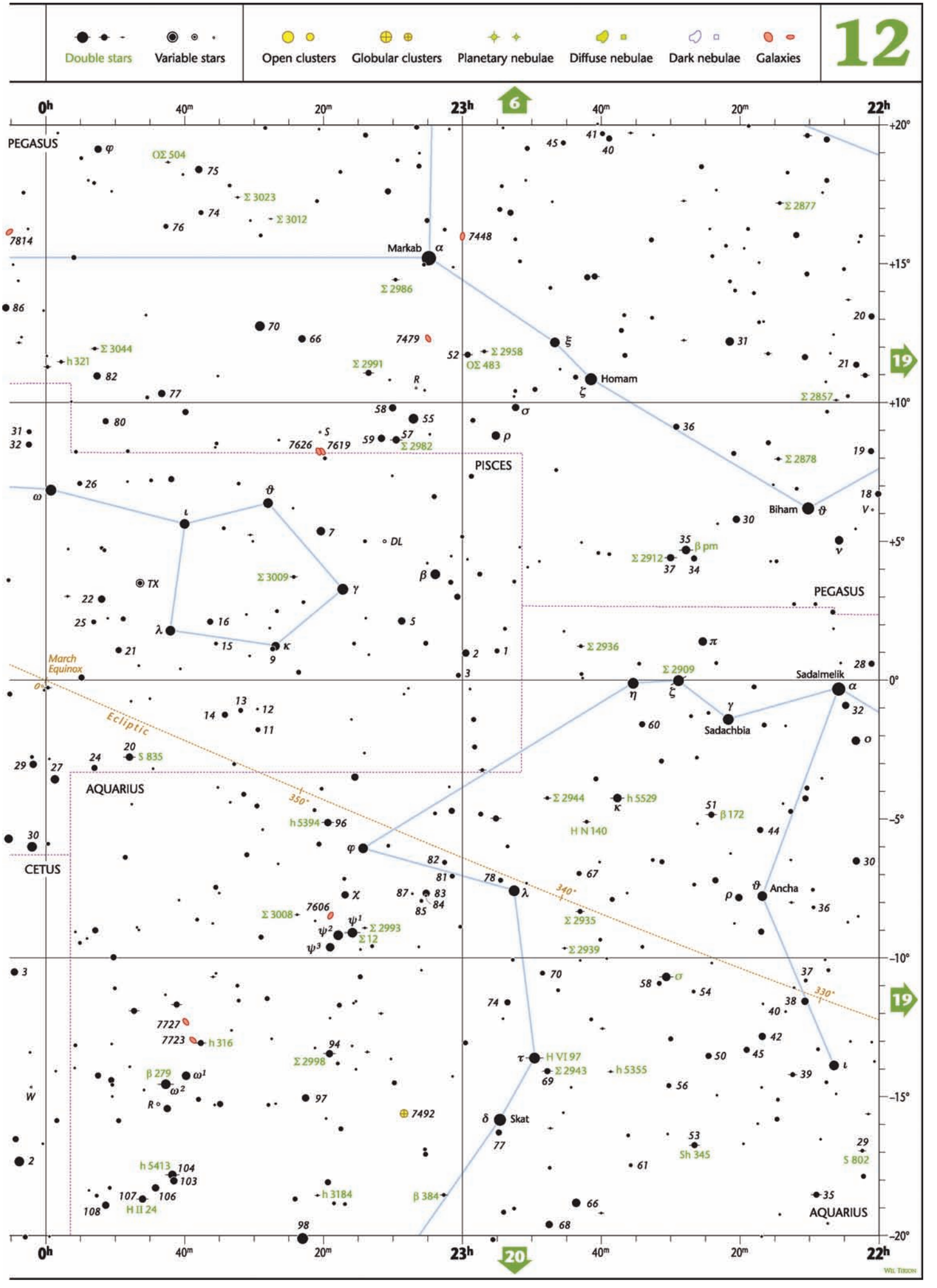
brighter than 0.0 | 0.0–0.5 | 0.5–1.0 | 1.0–1.5 | 1.5–2.0 | 2.0–2.5 | 2.5–3.0 | 3.0–3.5 | 3.5–4.0 | 4.0–4.5 | 4.5–5.0 | 5.0–5.5 | 5.5–6.0 | 6.0–6.5 | 6.5–7.0 | 7.0–7.5 | fainter

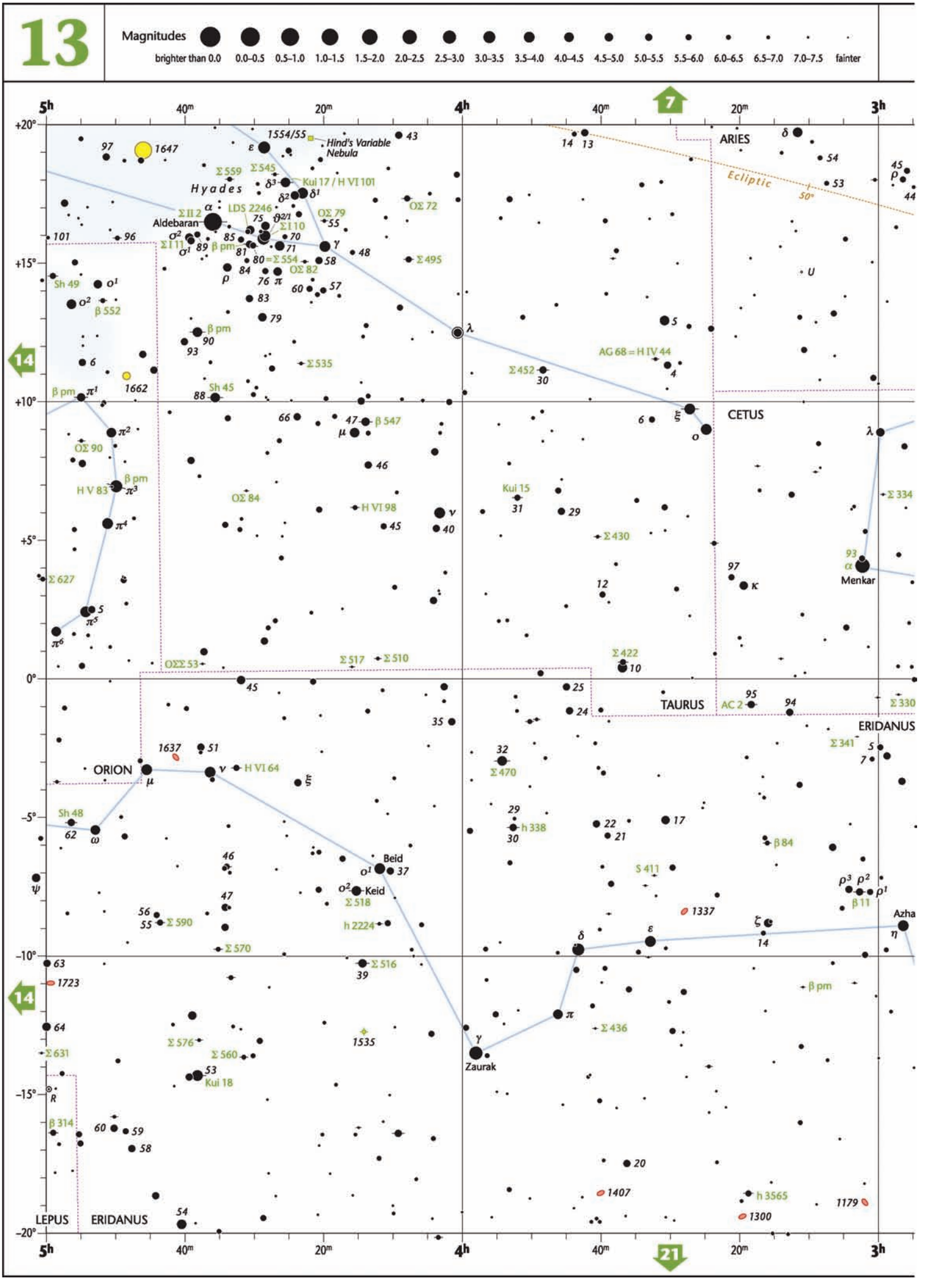


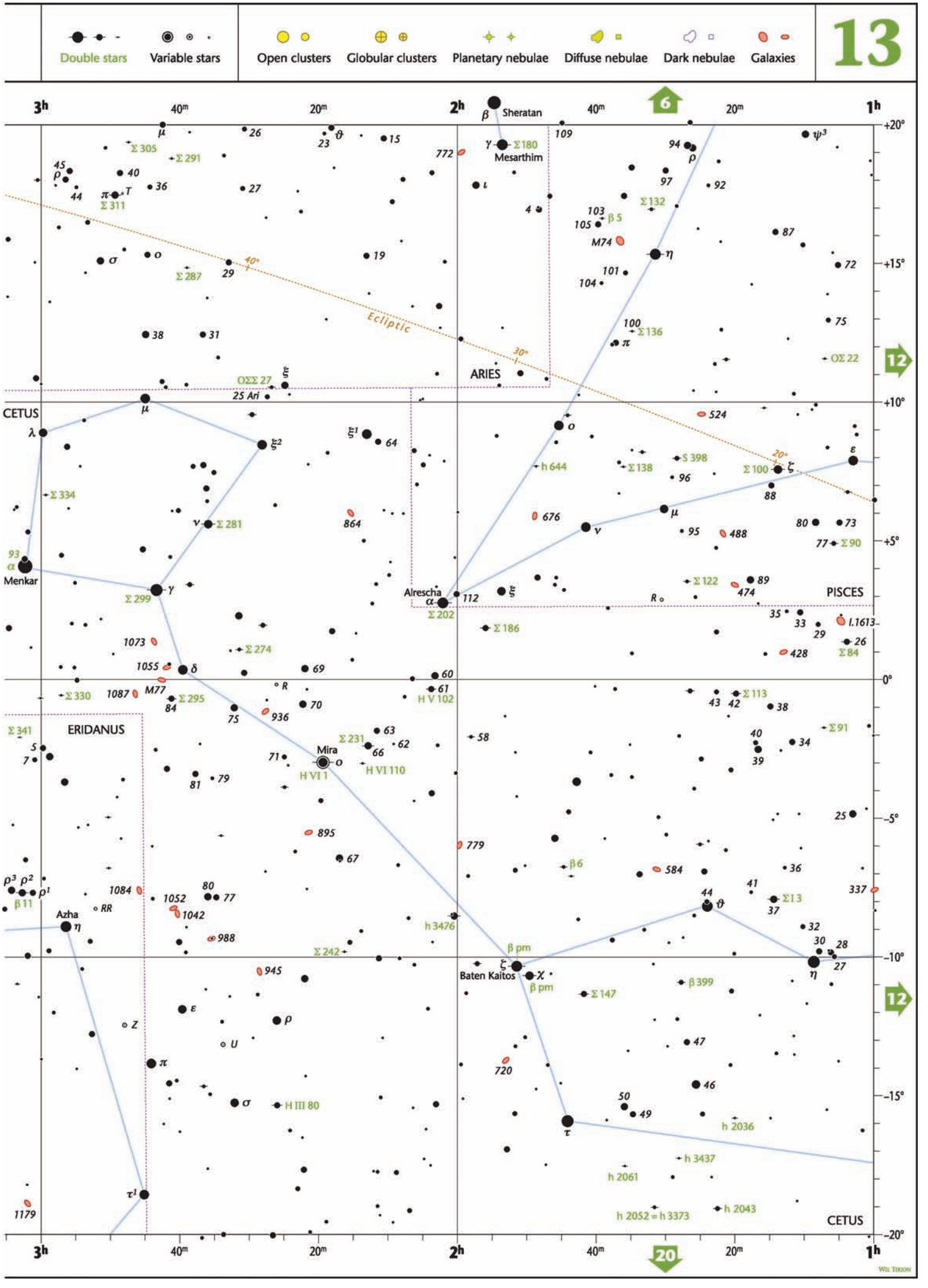

Double stars
Variable stars
Open clusters
Globular clusters
Planetary nebulae
Diffuse nebulae
Dark nebulae
Galaxies
11
20h
19h
18h
DRACO
LYRA
HERCULES
CYGNUS
VULPECULA
SAGITTA
AQUILA
OPHIUCHUS
Vega
Albireo
Sulafat
Sheliak
Ring Nebula
Dumbbell Nebula
Brocchi's Cluster
Cr399
M56
M57
M92
Dawes 9
Steph1
Galactic Equator
Tarazed



12
Magnitudes
brighter than 0.0
0.0–0.5
0.5–1.0
1.0–1.5
1.5–2.0
2.0–2.5
2.5–3.0
3.0–3.5
3.5–4.0
4.0–4.5
4.5–5.0
5.0–5.5
5.5–6.0
6.0–6.5
6.5–7.0
7.0–7.5
fainter
2h
40m
20m
1h
0h
6
13
20
+20°
+15°
+10°
+5°
0°
-5°
-10°
-15°
-20°
Sheratan
Mesarthim
Alrescha
Algenib
Baten Kaitos
Deneb Kaitos
PISCES
PEGASUS
ARIES
CETUS
AQR
Ecliptic
March Equinox
30°
20°
10°
0°
M74
Σ180
Σ132
β5
Σ136
OΣ20
OΣ22
OΣ10
Σ27
β1093
Σ5
h321
Σ22
Σ12
Σ36
h644
Σ138
S398
Σ100
Σ90
Σ122
Σ202
Σ186
I.1613
Σ84
Σ113
Σ91
h322
Σ39
β6
Σ13
h3476
β pm
h1995
h1981
h1953
Σ147
β399
h2036
β109
h1968
h3437
h2061
h2052 = h3373
h2043
5 Cet
TV
R
S
T
W

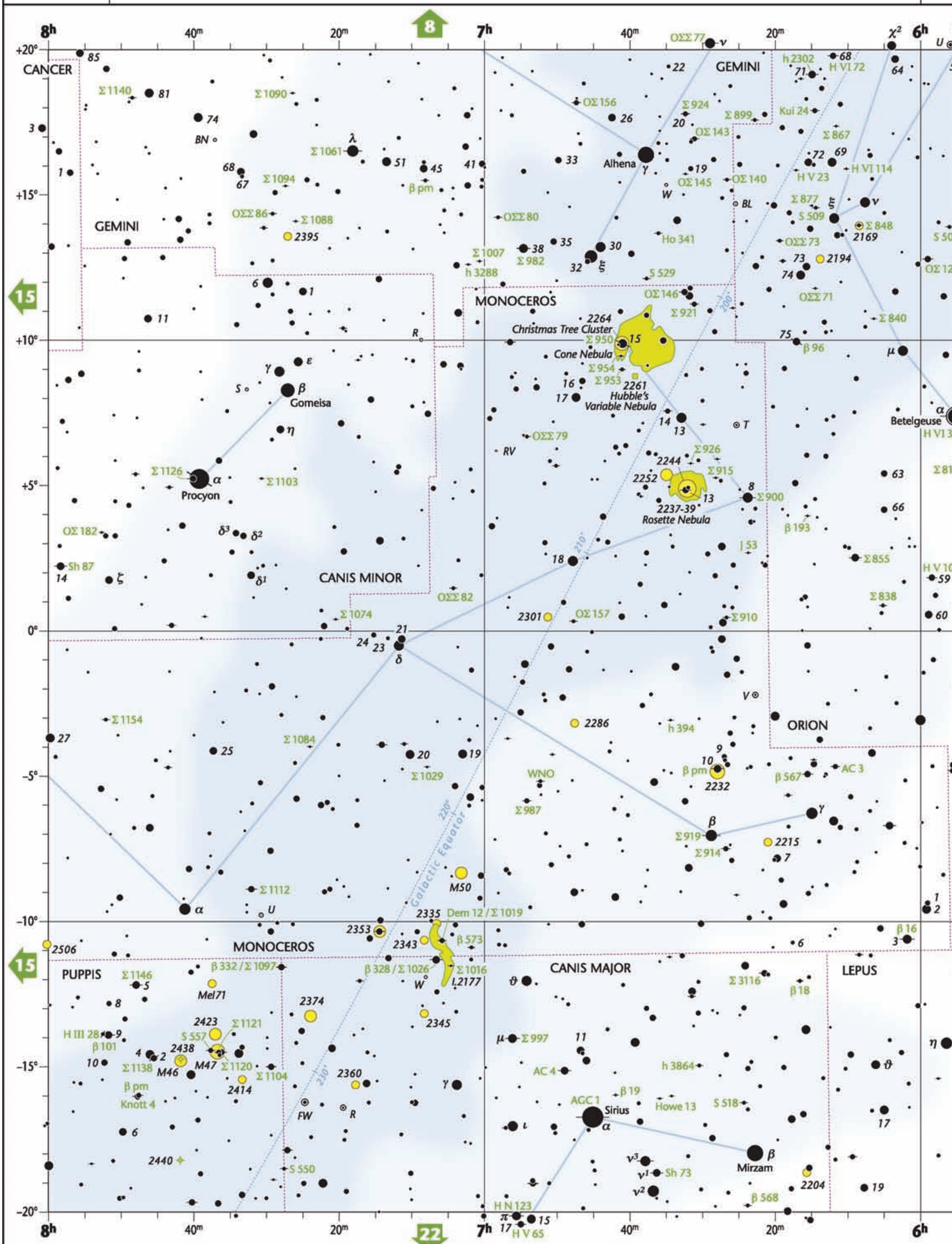

12
Double stars
Variable stars
Open clusters
Globular clusters
Planetary nebulae
Diffuse nebulae
Dark nebulae
Galaxies
0h
40m
20m
23h
22h
6
19
20
+20°
+15°
+10°
+5°
0°
−5°
−10°
−15°
−20°
PEGASUS
PISCES
AQUARIUS
CETUS
Markab
Homam
Biham
Sadalmelik
Sadachbia
Ancha
Skat
March Equinox
Ecliptic
350°
340°
330°
OΣ 504
Σ 3023
Σ 3012
Σ 2877
Σ 2986
Σ 3044
h 321
Σ 2991
Σ 2958
OΣ 483
Σ 2857
Σ 2982
Σ 2878
Σ 3009
TX
DL
β pm
Σ 2912
Σ 2936
Σ 2909
Σ 2944
h 5529
β 172
H N 140
h 5394
Σ 3008
Σ 2993
Σ 12
Σ 2935
Σ 2939
S 835
H VI 97
Σ 2943
h 5355
Σ 2998
h 316
β 279
H II 24
h 5413
h 3184
β 384
Sh 345
S 802
7814
7448
7479
7626
7619
7606
7727
7723
7492
W
R


13
Magnitudes
brighter than 0.0
0.0–0.5
0.5–1.0
1.0–1.5
1.5–2.0
2.0–2.5
2.5–3.0
3.0–3.5
3.5–4.0
4.0–4.5
4.5–5.0
5.0–5.5
5.5–6.0
6.0–6.5
6.5–7.0
7.0–7.5
fainter
5h
40m
20m
4h
40m
20m
3h
+20°
+15°
+10°
+5°
0°
−5°
−10°
−15°
−20°
7
14
21
ARIES
TAURUS
CETUS
ORION
ERIDANUS
LEPUS
Ecliptic
50°
Hyades
Aldebaran
Hind's Variable Nebula
1554/55
Kui 17 / H VI 101
LDS 2246
ΣI 10
ΣII 2
ΣI 11
β pm
OΣ 72
OΣ 79
OΣ 82
Σ 495
Sh 49
β 552
Σ 535
Sh 45
AG 68 = H IV 44
Σ 452
β 547
OΣ 90
H V 83
OΣ 84
H VI 98
Kui 15
Σ 430
Σ 627
Menkar
OΣΣ 53
Σ 517
Σ 510
Σ 422
Σ 334
AC 2
Σ 330
Σ 341
Σ 470
h 338
β 84
S 411
β 11
Azha
Beid
Keid
Σ 518
h 2224
Σ 590
Σ 570
Σ 516
H VI 64
Sh 48
Zaurak
Σ 436
Σ 576
Σ 560
Kui 18
Σ 631
β 314
h 3565
1637
1647
1662
1723
1535
1337
1407
1300
1179


Double stars
Variable stars
Open clusters
Globular clusters
Planetary nebulae
Diffuse nebulae
Dark nebulae
Galaxies
13
3h
40m
20m
2h
40m
20m
1h
+20°
+15°
+10°
+5°
0°
−5°
−10°
−15°
−20°
Sheratan
Mesarthim
ARIES
Ecliptic
40°
30°
20°
CETUS
Menkar
ERIDANUS
Mira
Azha
Baten Kaitos
Alrescha
PISCES
CETUS
M74
M77
6
12
12
20

14

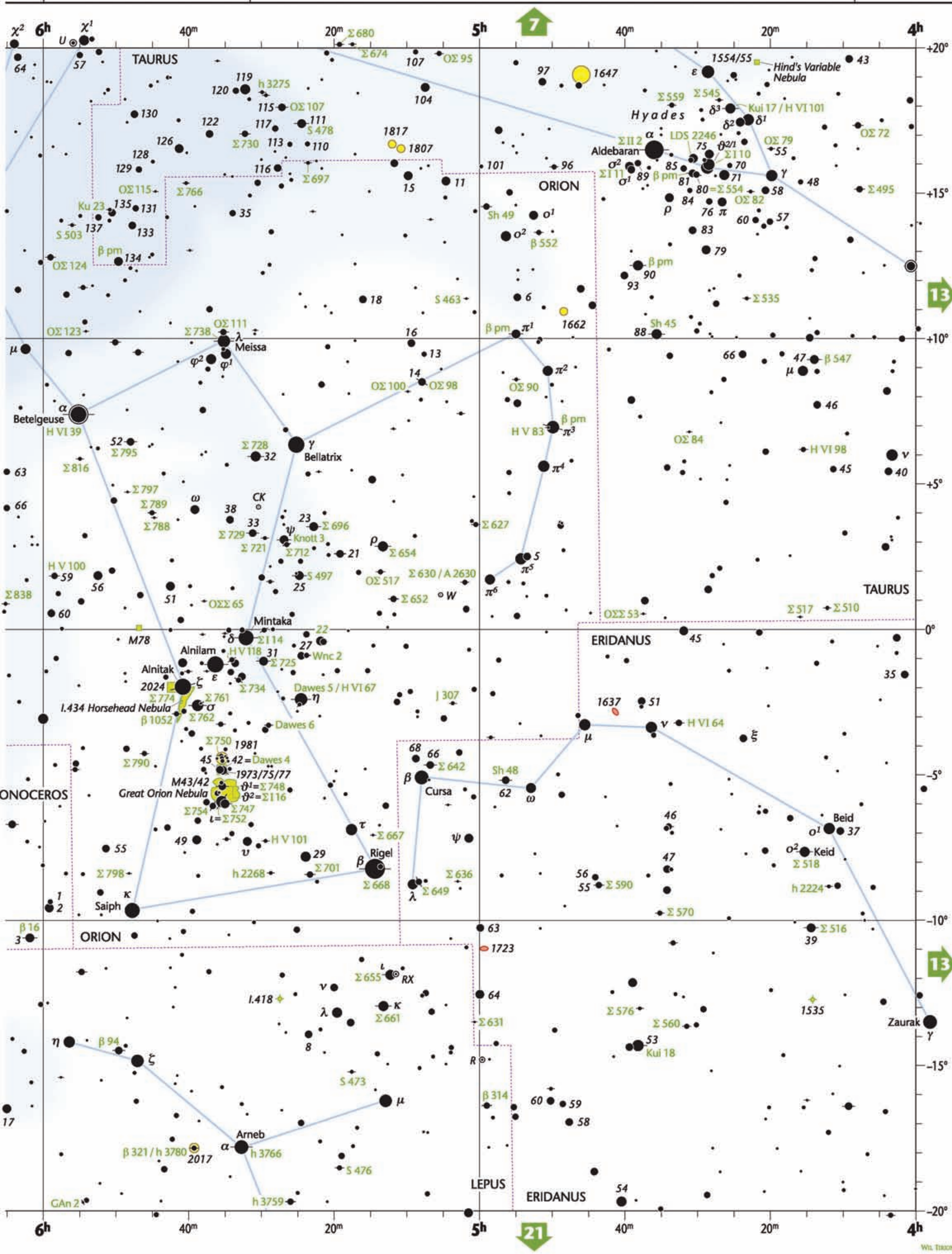
Magnitudes: brighter than 0.0 | 0.0–0.5 | 0.5–1.0 | 1.0–1.5 | 1.5–2.0 | 2.0–2.5 | 2.5–3.0 | 3.0–3.5 | 3.5–4.0 | 4.0–4.5 | 4.5–5.0 | 5.0–5.5 | 5.5–6.0 | 6.0–6.5 | 6.5–7.0 | 7.0–7.5 | fainter



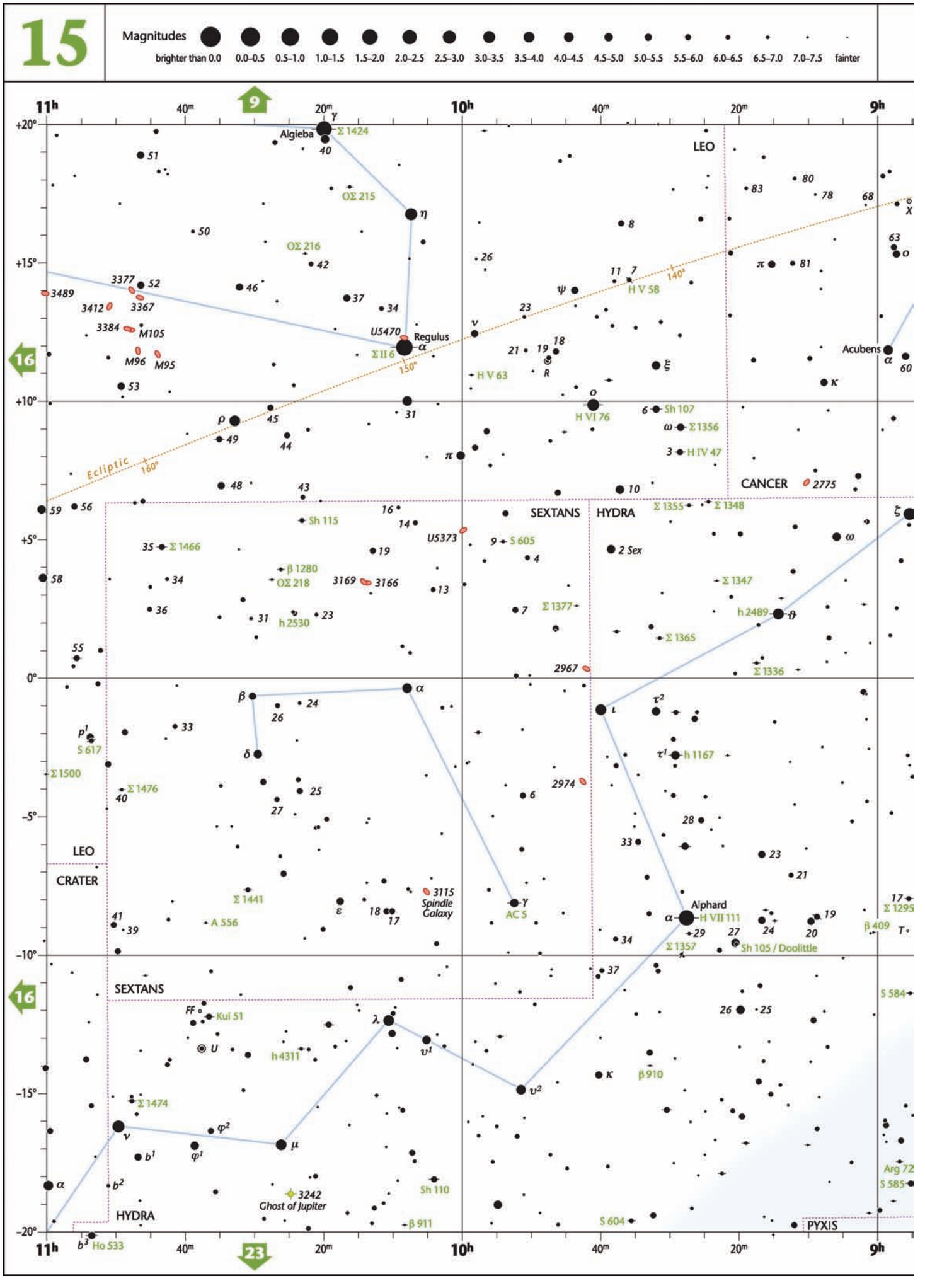
8h
40m
20m
7h
40m
20m
6h
+20°
+15°
+10°
+5°
0°
-5°
-10°
-15°
-20°
8
15
22
CANCER
GEMINI
MONOCEROS
CANIS MINOR
ORION
PUPPIS
CANIS MAJOR
LEPUS
Alhena
Procyon
Gomeisa
Betelgeuse
Sirius
Mirzam
Christmas Tree Cluster
Cone Nebula
Hubble's Variable Nebula
Rosette Nebula
Galactic Equator
M50
M46
M47
Mel 71
Σ 1140
Σ 1090
Σ 1061
Σ 1094
Σ 1088
ΟΣΣ 86
ΟΣ 156
Σ 924
Σ 899
ΟΣ 143
ΟΣ 145
ΟΣ 140
Kui 24
h 2302
H VI 72
Σ 867
H VI 114
H V 23
Σ 877
S 509
Σ 848
ΟΣΣ 73
ΟΣΣ 71
ΟΣ 124
S 503
Σ 840
β 96
ΟΣΣ 80
Σ 1007
Σ 982
h 3288
Ho 341
S 529
ΟΣ 146
Σ 921
Σ 950
Σ 954
Σ 953
ΟΣΣ 79
Σ 926
Σ 915
Σ 900
Σ 1126
Σ 1103
ΟΣ 182
Sh 87
β 193
J 53
Σ 855
H V 100
Σ 838
Σ 816
H VI 39
ΟΣΣ 82
Σ 1074
ΟΣ 157
Σ 910
Σ 1154
Σ 1084
Σ 1029
h 394
WNO
Σ 987
β pm
β 567
AC 3
Σ 919
Σ 914
Σ 1112
Dem 12 / Σ 1019
β 573
Σ 1016
β 328 / Σ 1026
β 332 / Σ 1097
Σ 1146
H III 28
β 101
Σ 1138
S 557
Σ 1121
Σ 1120
Σ 1104
Knott 4
S 550
μ Σ 997
AC 4
AGC 1
β 19
Howe 13
S 518
h 3864
Σ 3116
β 18
β 16
Sh 73
β 568
H N 123
H V 65
2264
2261
2244
2252
2237-39
2301
2286
2232
2215
2395
2194
2169
2353
2343
2335
2345
2374
2423
2438
2414
2360
2440
2506
2204
I.2177

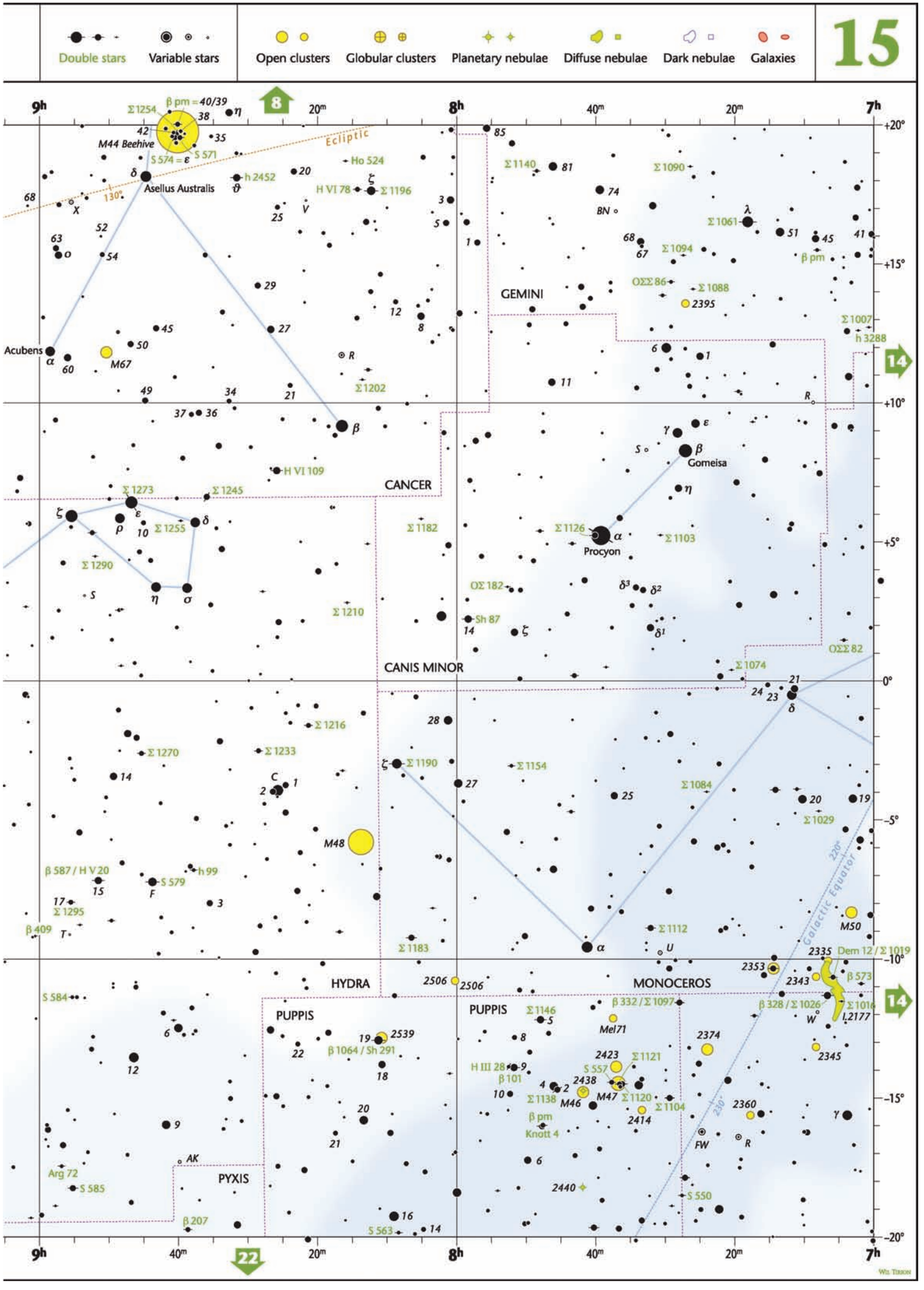
Double stars | Variable stars | Open clusters | Globular clusters | Planetary nebulae | Diffuse nebulae | Dark nebulae | Galaxies

14



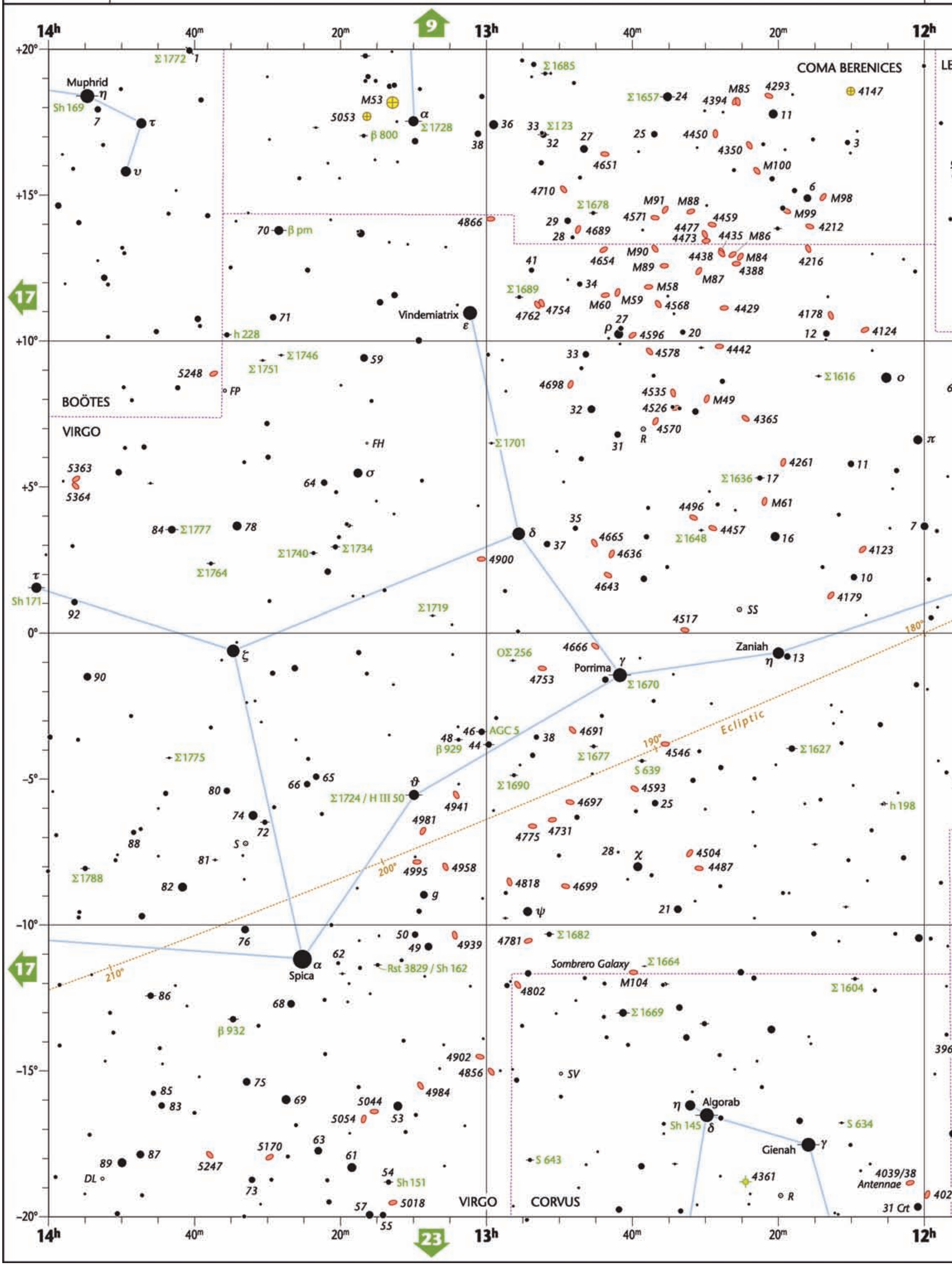
7
13
13
21
6h
5h
4h
40m
20m
+20°
+15°
+10°
+5°
0°
−5°
−10°
−15°
−20°
TAURUS
ORION
ERIDANUS
MONOCEROS
LEPUS
Hyades
Aldebaran
Betelgeuse
Bellatrix
Meissa
Mintaka
Alnilam
Alnitak
Saiph
Rigel
Cursa
Beid
Keid
Zaurak
Arneb
Hind's Variable Nebula
I.434 Horsehead Nebula
Great Orion Nebula
M43/42
M78
1647
1817
1807
1662
1554/55
1637
1723
1535
2024
1981
1973/75/77
2017
I.418
Kui 17 / H VI 101
LDS 2246
Dawes 5 / H VI 67
Dawes 6
42 = Dawes 4
Knott 3
Wnc 2
Kui 18
β 321 / h 3780
h 3766
h 3759
h 2268
h 2224
GAn 2
Σ 630 / A 2630
Wil Tirion


15
Magnitudes
brighter than 0.0
0.0–0.5
0.5–1.0
1.0–1.5
1.5–2.0
2.0–2.5
2.5–3.0
3.0–3.5
3.5–4.0
4.0–4.5
4.5–5.0
5.0–5.5
5.5–6.0
6.0–6.5
6.5–7.0
7.0–7.5
fainter
11h
40m
20m
10h
40m
20m
9h
+20°
+15°
+10°
+5°
0°
−5°
−10°
−15°
−20°
9
16
16
23
Algieba
Regulus
Acubens
Alphard
Ecliptic
140°
150°
160°
LEO
CANCER
SEXTANS
HYDRA
CRATER
PYXIS
Spindle Galaxy
Ghost of Jupiter
AC 5
H V 58
H V 63
H VI 76
H IV 47
H VII 111
Sh 105 / Doolittle
Sh 107
Sh 115
Sh 110
h 2530
h 4311
h 1167
h 2489
Kui 51
A 556
Ho 533
S 617
S 605
S 584
S 585
S 604
Arg 72
β 1280
Oξ 215
Oξ 216
Oξ 218
Σ II 6
Σ 1424
Σ 1466
Σ 1476
Σ 1500
Σ 1441
Σ 1474
Σ 1377
Σ 1347
Σ 1348
Σ 1355
Σ 1365
Σ 1336
Σ 1356
Σ 1357
Σ 1295
β 409
β 910
β 911
U5470
U5373
3377
3489
3412
3367
3384
M105
M96
M95
3169
3166
2967
2974
2775
2 Sex
3115
3242

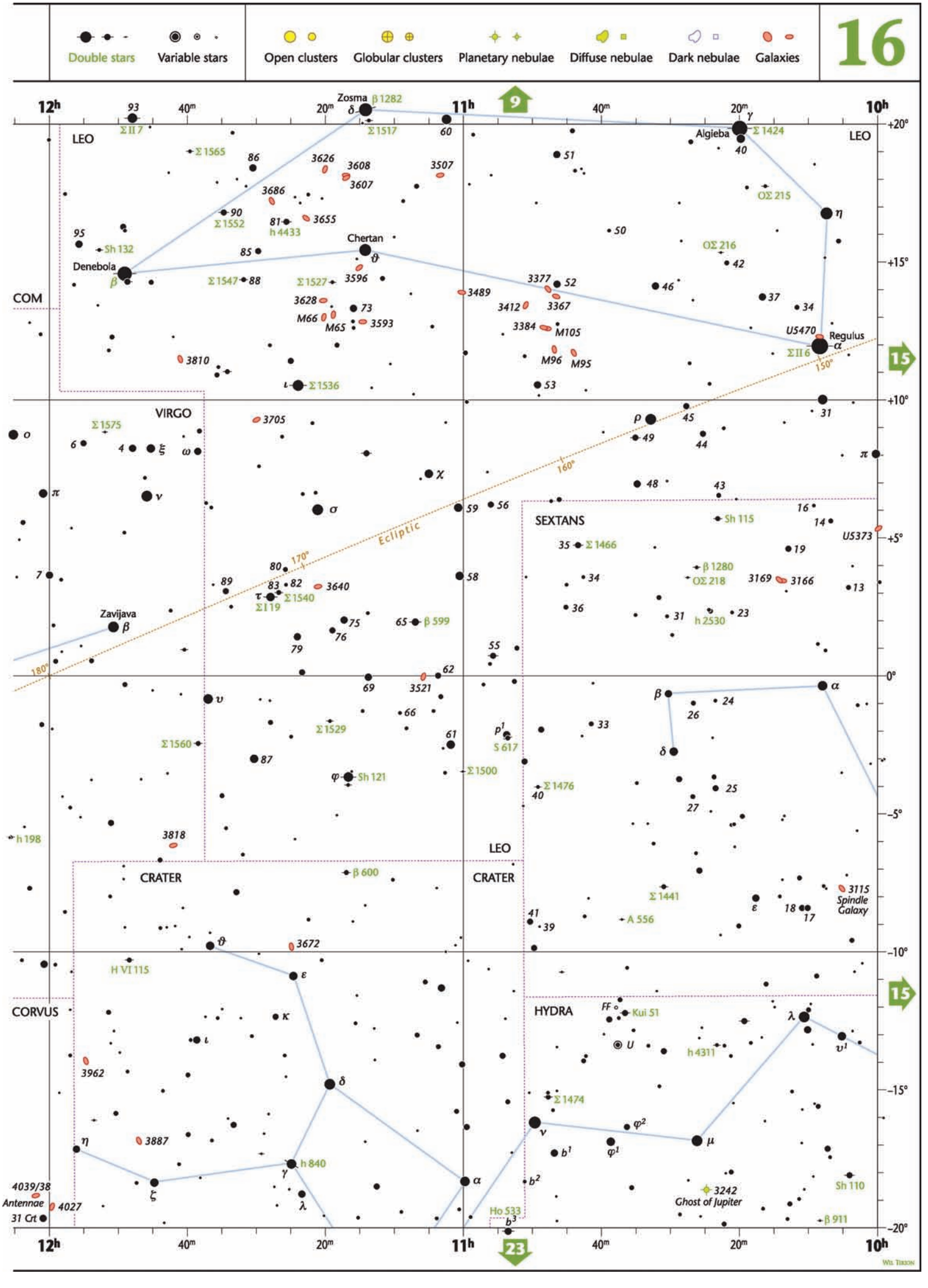

Double stars
Variable stars
Open clusters
Globular clusters
Planetary nebulae
Diffuse nebulae
Dark nebulae
Galaxies
15
9h
8h
7h
40m
20m
+20°
+15°
+10°
+5°
0°
−5°
−10°
−15°
−20°
Ecliptic
Galactic Equator
M44 Beehive
Asellus Australis
Acubens
M67
Gomeisa
Procyon
M48
M50
M46
M47
GEMINI
CANCER
CANIS MINOR
HYDRA
PUPPIS
MONOCEROS
PYXIS

16

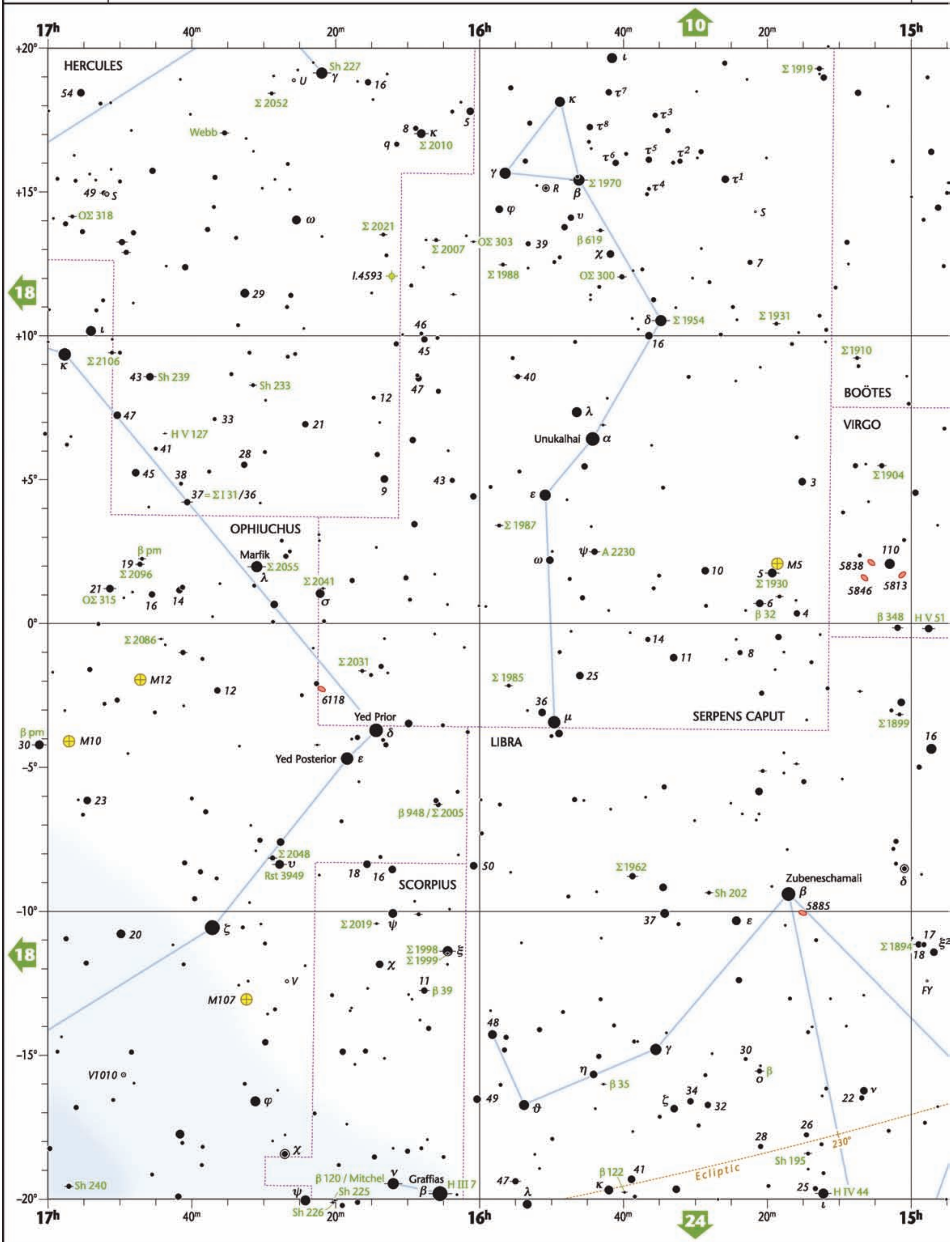
Magnitudes																
brighter than 0.0	0.0–0.5	0.5–1.0	1.0–1.5	1.5–2.0	2.0–2.5	2.5–3.0	3.0–3.5	3.5–4.0	4.0–4.5	4.5–5.0	5.0–5.5	5.5–6.0	6.0–6.5	6.5–7.0	7.0–7.5	fainter



14h
40m
20m
13h
40m
20m
12h
+20°
+15°
+10°
+5°
0°
−5°
−10°
−15°
−20°
9
17
17
23
COMA BERENICES
LEO
BOÖTES
VIRGO
VIRGO
CORVUS
CRT
Muphrid
Vindemiatrix
Porrima
Zaniah
Spica
Algorab
Gienah
Sombrero Galaxy
Antennae
Ecliptic
180°
190°
200°
210°
M53
M85
M100
M98
M99
M91
M88
M86
M84
M90
M89
M87
M58
M59
M60
M49
M61
M104
Σ1772
Σ1685
Σ1657
Σ123
Σ1728
β 800
Σ1678
β pm
Σ1689
h 228
Σ1746
Σ1751
Σ1616
Σ1701
Σ1636
Σ1648
Σ1777
Σ1734
Σ1740
Σ1764
Σ1719
OΣ 256
Σ1670
AGC 5
β 929
Σ1627
Σ1677
S 639
Σ1775
Σ1690
Σ1724 / H III 50
h 198
Σ1788
Σ1682
Rst 3829 / Sh 162
Σ1664
Σ1604
Σ1669
β 932
Sh 145
S 634
S 643
Sh 151
Sh 169
Sh 171
31 Crt


16
Double stars
Variable stars
Open clusters
Globular clusters
Planetary nebulae
Diffuse nebulae
Dark nebulae
Galaxies
12h
11h
10h
9
15
23
LEO
COM
VIRGO
CRATER
CORVUS
HYDRA
SEXTANS
Zosma
Chertan
Denebola
Algieba
Regulus
Zavijava
Ecliptic
Spindle Galaxy
Ghost of Jupiter
Antennae

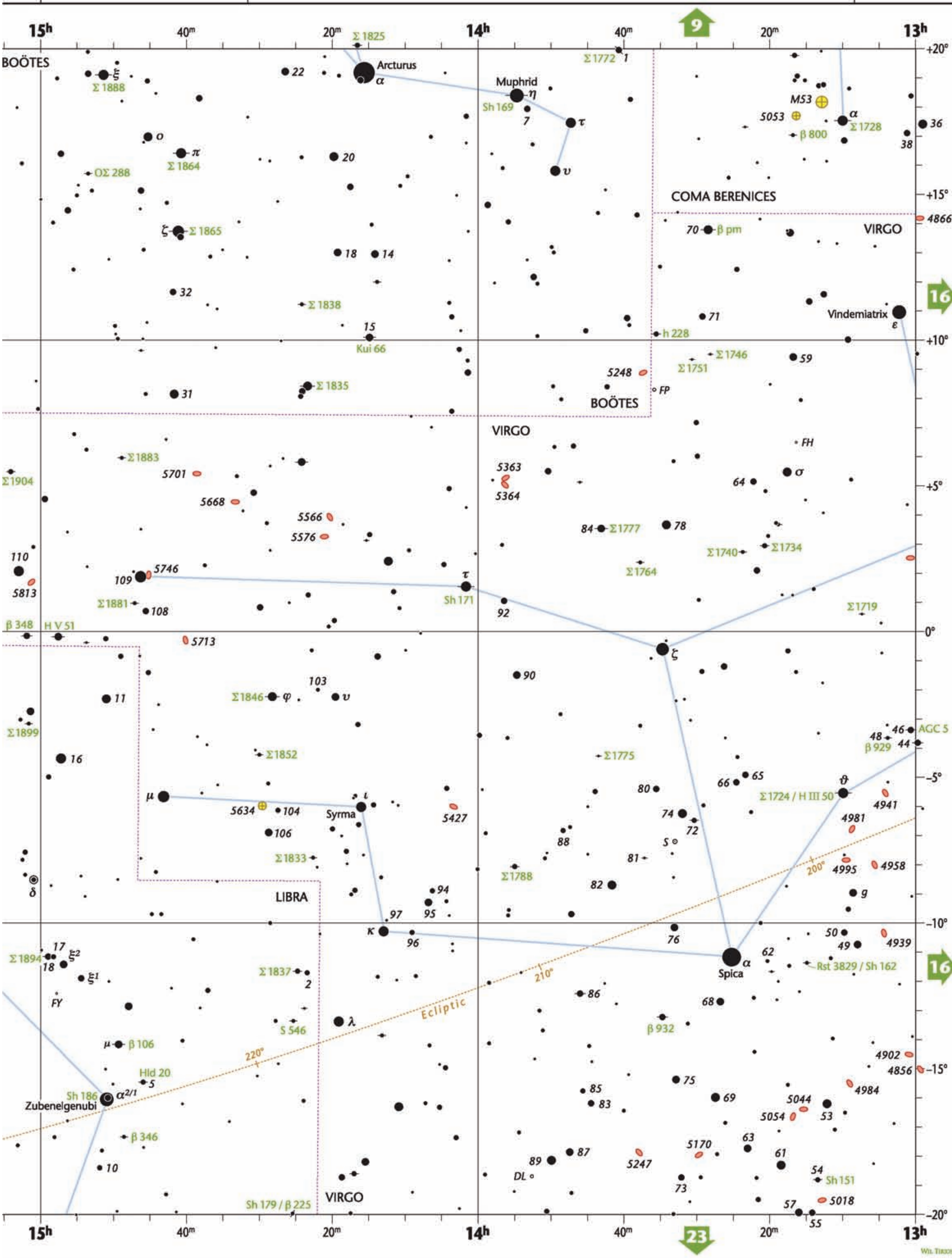
Magnitudes: brighter than 0.0 · 0.0–0.5 · 0.5–1.0 · 1.0–1.5 · 1.5–2.0 · 2.0–2.5 · 2.5–3.0 · 3.0–3.5 · 3.5–4.0 · 4.0–4.5 · 4.5–5.0 · 5.0–5.5 · 5.5–6.0 · 6.0–6.5 · 6.5–7.0 · 7.0–7.5 · fainter



17h
40m
20m
16h
40m
20m
15h
10
18
24
+20°
+15°
+10°
+5°
0°
-5°
-10°
-15°
-20°
HERCULES
OPHIUCHUS
BOÖTES
VIRGO
SERPENS CAPUT
LIBRA
SCORPIUS
Unukalhai
Marfik
Yed Prior
Yed Posterior
Zubeneschamali
Graffias
Ecliptic
230°
Sh 227
Σ 2052
Webb
Σ 2010
Σ 2021
I.4593
Σ 2007
OΣ 303
Σ 1988
β 619
OΣ 300
Σ 1970
Σ 1954
Σ 1931
Σ 1919
Σ 1910
OΣ 318
Σ 2106
Sh 239
Sh 233
H V 127
37 = Σ I 31/36
Σ 1987
A 2230
Σ 2055
Σ 2041
β pm
Σ 2096
OΣ 315
M5
Σ 1930
β 32
5838
5846
5813
Σ 1904
β 348
H V 51
Σ 2086
M12
Σ 2031
Σ 1985
6118
Σ 1899
M10
β 948 / Σ 2005
Σ 2048
Rst 3949
Σ 1962
Sh 202
5885
Σ 2019
Σ 1998
Σ 1999
β 39
Σ 1894
FY
M107
V1010
β 35
Sh 240
β 120 / Mitchel
Sh 225
Sh 226
H III 7
β 122
Sh 195
H IV 44

Double stars · Variable stars · Open clusters · Globular clusters · Planetary nebulae · Diffuse nebulae · Dark nebulae · Galaxies

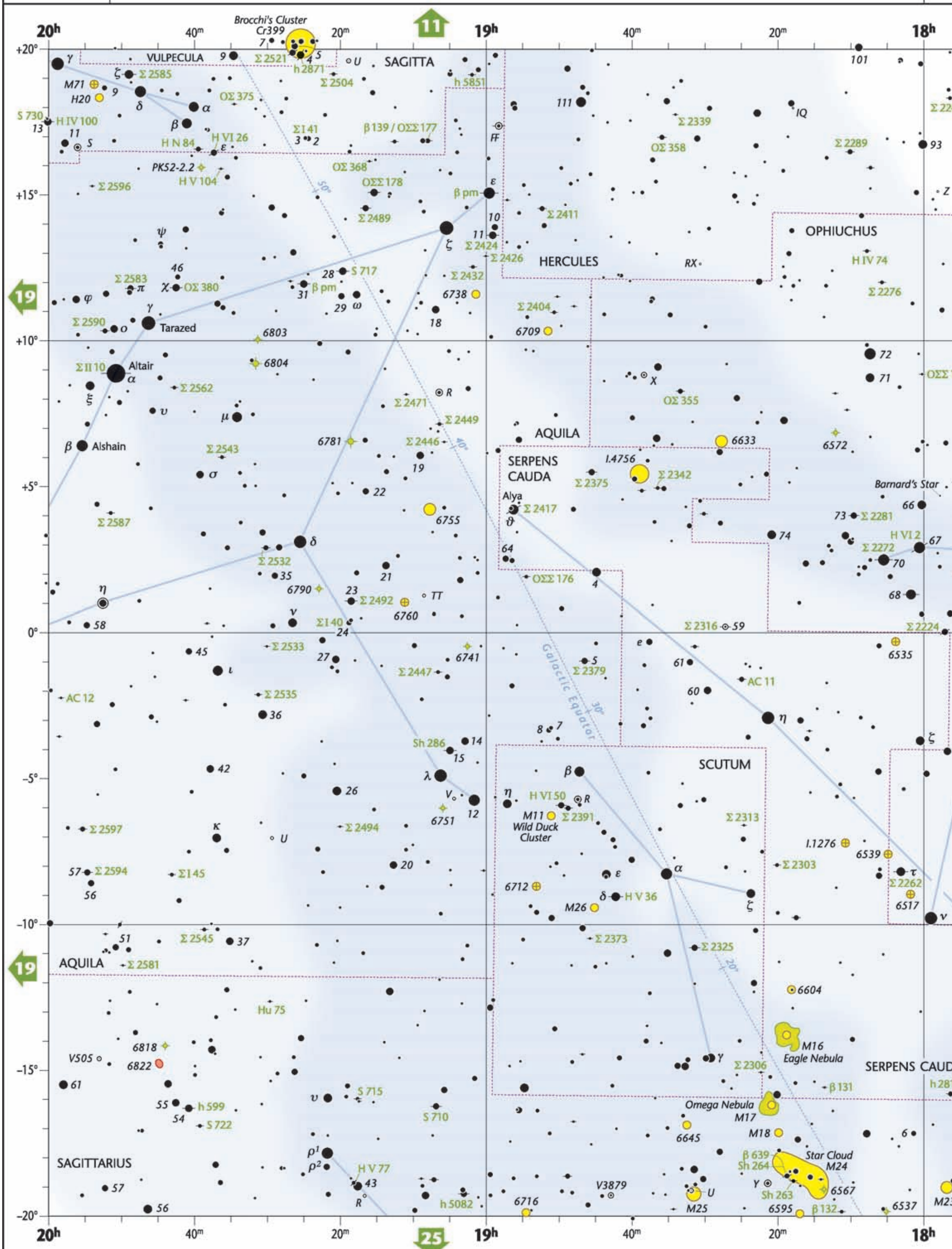
17



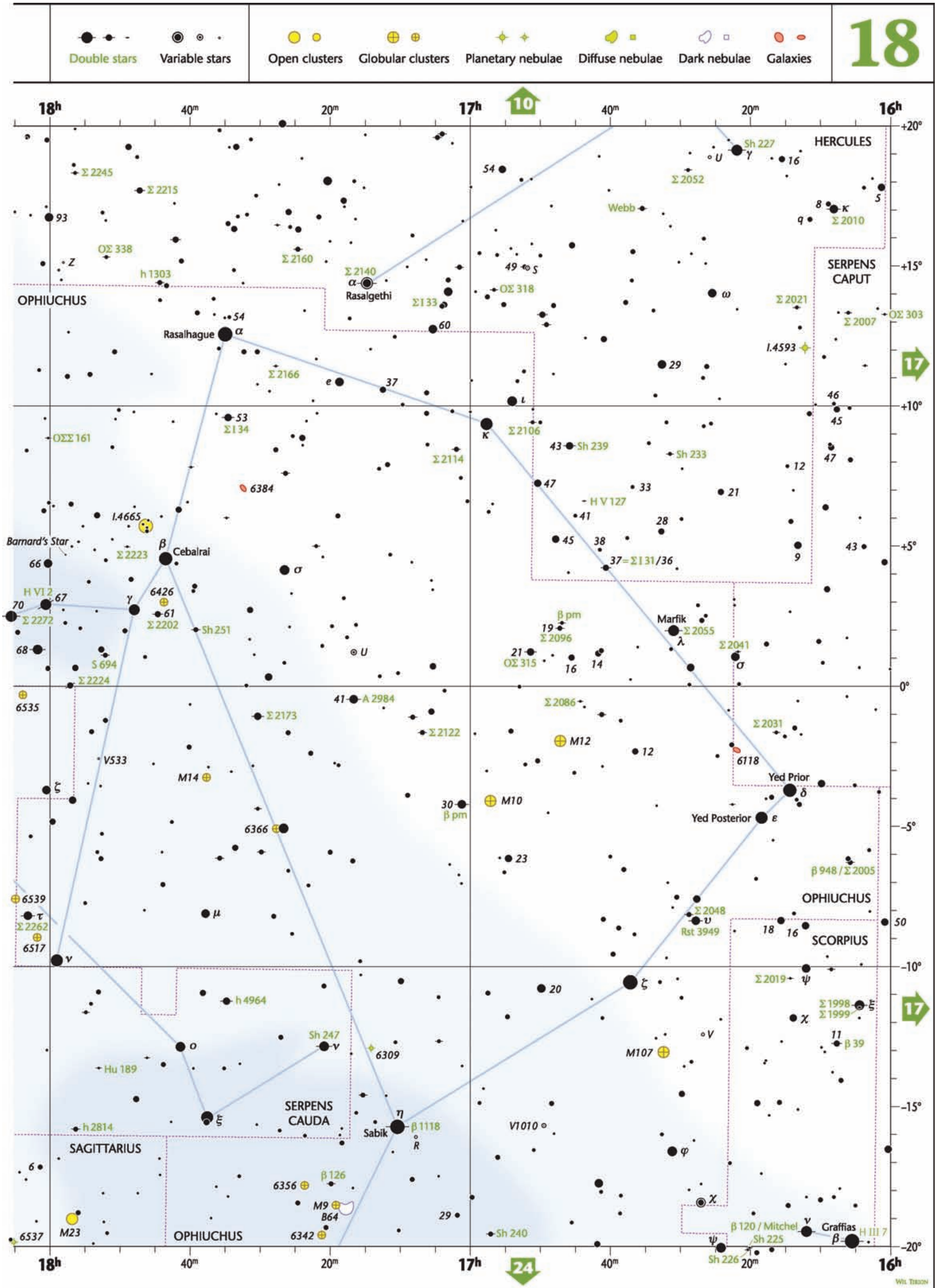
15h
40m
20m
14h
40m
20m
13h
9
16
16
23
+20°
+15°
+10°
+5°
0°
−5°
−10°
−15°
−20°
BOÖTES
COMA BERENICES
VIRGO
BOÖTES
VIRGO
LIBRA
VIRGO
Arcturus
Muphrid
Vindemiatrix
Syrma
Spica
Zubenelgenubi
M53
Ecliptic
200°
210°
220°
Σ 1825
Σ 1888
Σ 1864
OΣ 288
Σ 1865
Σ 1838
Kui 66
Σ 1835
Sh 169
Σ 1772
β 800
Σ 1728
β pm
h 228
Σ 1746
Σ 1751
Σ 1883
Σ 1904
Σ 1777
Σ 1740
Σ 1734
Σ 1764
Σ 1881
Sh 171
Σ 1719
β 348
H V 51
Σ 1846
Σ 1899
Σ 1852
Σ 1775
Σ 1724 / H III 50
AGC 5
β 929
Σ 1833
Σ 1788
Σ 1894
Σ 1837
Rst 3829 / Sh 162
S 546
β 932
β 106
Hld 20
Sh 186
β 346
Sh 179 / β 225
Sh 151
Wil Tirion

18

Magnitudes																
brighter than 0.0	0.0–0.5	0.5–1.0	1.0–1.5	1.5–2.0	2.0–2.5	2.5–3.0	3.0–3.5	3.5–4.0	4.0–4.5	4.5–5.0	5.0–5.5	5.5–6.0	6.0–6.5	6.5–7.0	7.0–7.5	fainter

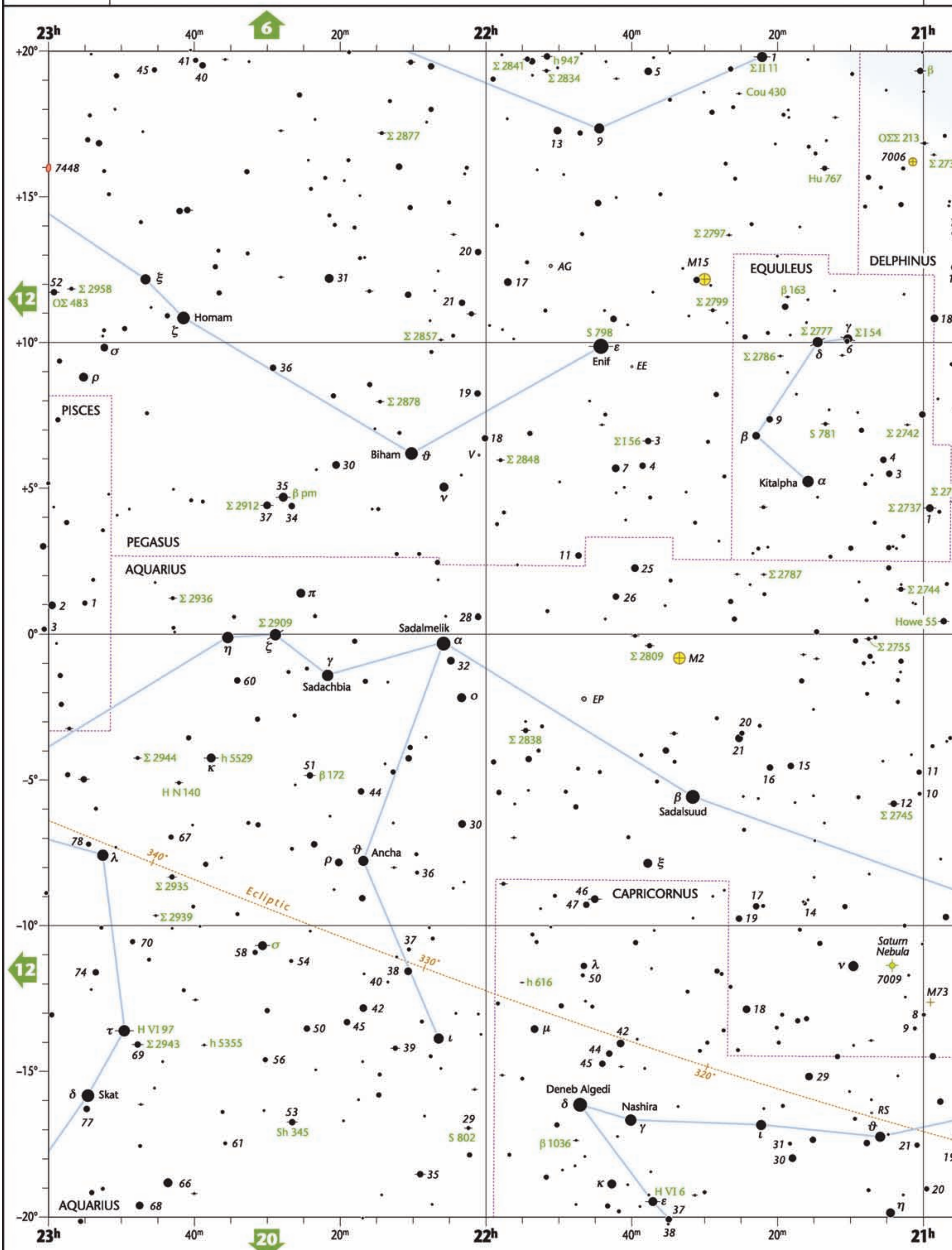


20h
40m
20m
19h
40m
20m
18h
+20°
+15°
+10°
+5°
0°
–5°
–10°
–15°
–20°
11
19
19
25
VULPECULA
SAGITTA
Brocchi's Cluster
Cr399
h 2871
Σ 2521
Σ 2585
Σ 2504
h 5851
M71
H20
OΣ 375
S 730
H IV 100
Σ141
β 139 / OΣΣ 177
H N 84
H VI 26
PK52-2.2
H V 104
OΣ 368
OΣΣ 178
Σ 2596
β pm
Σ 2489
Σ 2411
Σ 2424
Σ 2426
HERCULES
OPHIUCHUS
H IV 74
Σ 2276
Σ 2339
OΣ 358
Σ 2289
Σ 2245
IQ
RX
Σ 2583
OΣ 380
S 717
Σ 2432
6738
Σ 2590
Tarazed
Σ 2404
6709
6803
6804
Altair
Σ II 10
Σ 2562
Σ 2471
Σ 2449
OΣ 355
OΣΣ 16
Alshain
6781
Σ 2446
AQUILA
6633
6572
Σ 2543
SERPENS
CAUDA
I.4756
Σ 2342
Σ 2375
Barnard's Star
Σ 2587
6755
Alya
Σ 2417
Σ 2281
H VI 2
Σ 2272
Σ 2532
OΣΣ 176
6790
Σ 2492
6760
TT
Σ140
Σ 2316
Σ 2224
6535
Σ 2533
6741
Σ 2379
Σ 2447
AC 11
AC 12
Σ 2535
Galactic Equator
Sh 286
SCUTUM
H VI 50
M11
Wild Duck
Cluster
Σ 2391
Σ 2313
Σ 2597
Σ 2494
6751
I.1276
6539
Σ 2303
Σ 2594
Σ145
6712
H V 36
M26
Σ 2262
6517
Σ 2545
Σ 2373
Σ 2325
AQUILA
Σ 2581
6604
Hu 75
M16
Eagle Nebula
6818
V505
6822
SERPENS CAUDA
Σ 2306
β 131
h 2814
h 599
S 715
S 722
S 710
Omega Nebula
M17
6645
M18
SAGITTARIUS
H V 77
β 639
Sh 264
Star Cloud
M24
6567
V3879
Sh 263
h 5082
6716
M25
6595
β 132
6537
M23

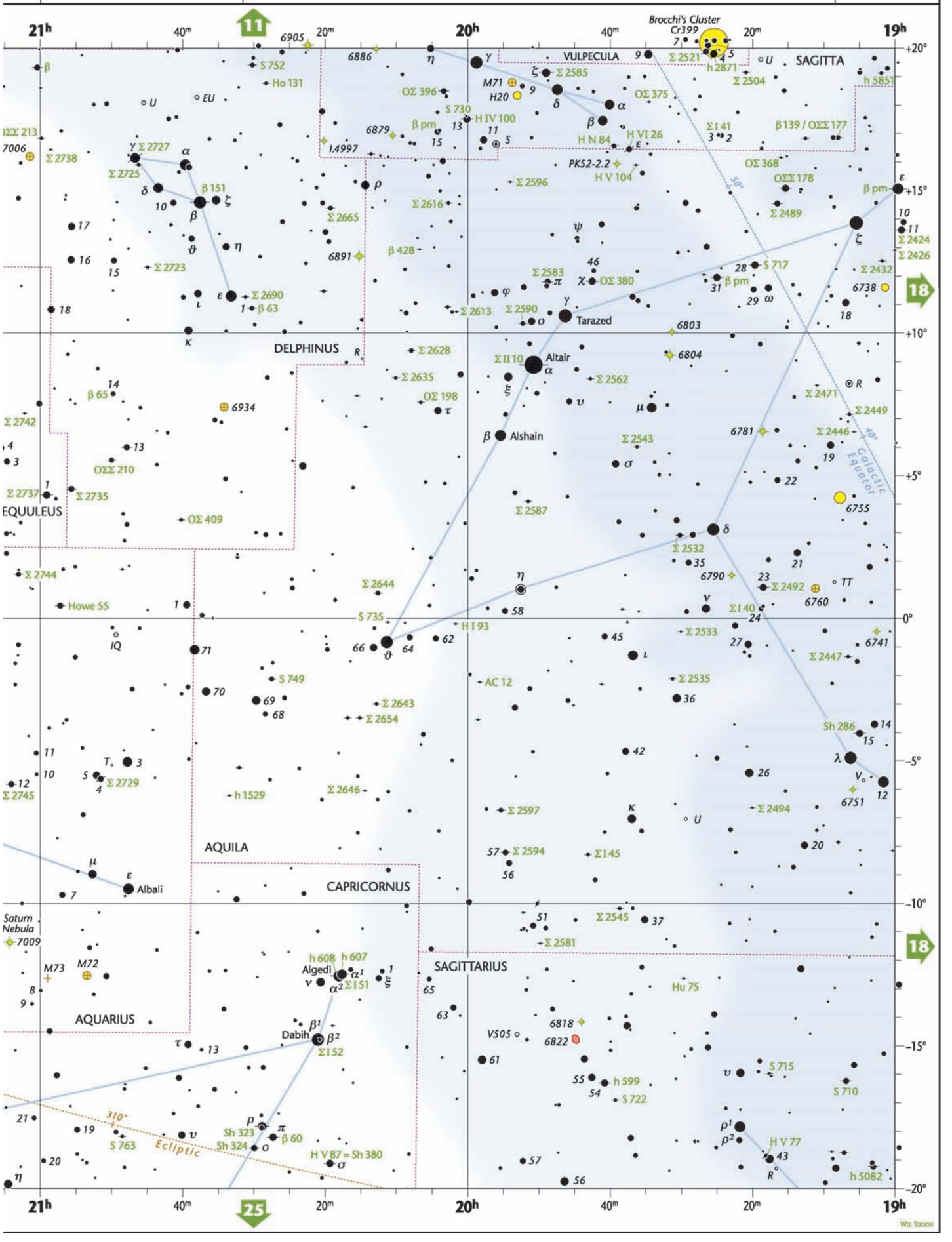


Double stars
Variable stars
Open clusters
Globular clusters
Planetary nebulae
Diffuse nebulae
Dark nebulae
Galaxies
18
18h
40m
20m
17h
10
40m
20m
16h
+20°
+15°
+10°
+5°
0°
−5°
−10°
−15°
−20°
17
17
24
HERCULES
SERPENS CAPUT
OPHIUCHUS
OPHIUCHUS
SCORPIUS
SERPENS CAUDA
SAGITTARIUS
OPHIUCHUS
Rasalgethi
Rasalhague
Cebalrai
Barnard's Star
Marfik
Yed Prior
Yed Posterior
Sabik
Graffias
Σ 2245
Σ 2215
OΣ 338
h 1303
Σ 2160
Σ 2140
Σ 133
OΣ 318
Webb
Σ 2052
Sh 227
Σ 2010
Σ 2021
OΣ 303
Σ 2007
I.4593
Σ 2166
OΣΣ 161
Σ 134
Σ 2114
Σ 2106
Sh 239
Sh 233
H V 127
6384
I.4665
Σ 2223
H VI 2
Σ 2272
6426
Σ 2202
Sh 251
S 694
Σ 2224
6535
37 = Σ 131/36
β pm
Σ 2096
OΣ 315
Σ 2055
Σ 2041
A 2984
Σ 2173
Σ 2122
Σ 2086
M12
Σ 2031
6118
V533
M14
M10
β pm
6366
β 948 / Σ 2005
6539
Σ 2262
6517
Σ 2048
Rst 3949
Σ 2019
Σ 1998
Σ 1999
h 4964
Sh 247
6309
M107
β 39
Hu 189
h 2814
β 1118
V1010
6356
β 126
M9
B64
6342
Sh 240
M23
6537
β 120 / Mitchel
Sh 225
Sh 226
H III 7
WIL TIRION

Magnitudes: brighter than 0.0 | 0.0–0.5 | 0.5–1.0 | 1.0–1.5 | 1.5–2.0 | 2.0–2.5 | 2.5–3.0 | 3.0–3.5 | 3.5–4.0 | 4.0–4.5 | 4.5–5.0 | 5.0–5.5 | 5.5–6.0 | 6.0–6.5 | 6.5–7.0 | 7.0–7.5 | fainter

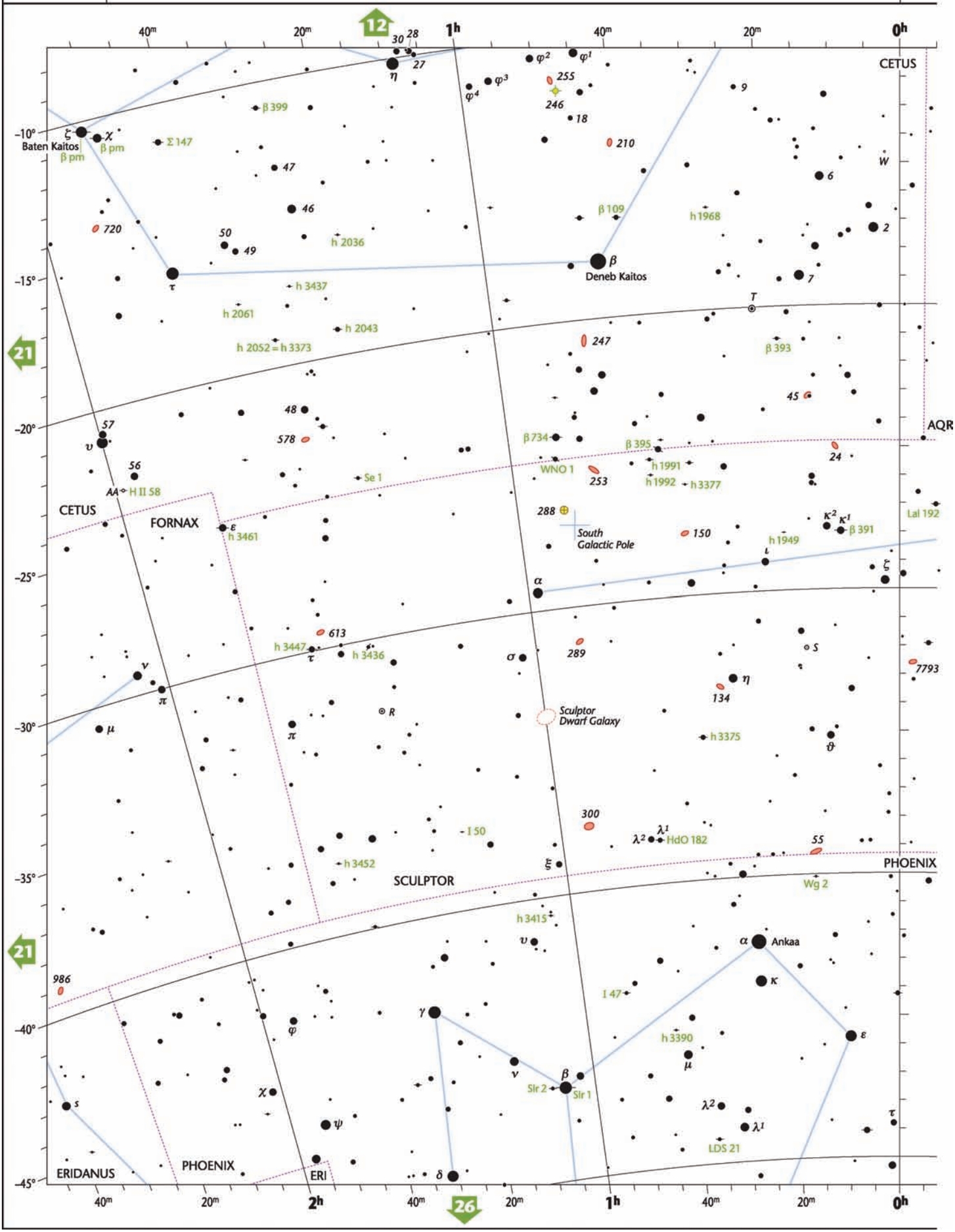


23h
40m
20m
22h
40m
20m
21h
6
12
12
20
+20°
+15°
+10°
+5°
0°
–5°
–10°
–15°
–20°
PEGASUS
AQUARIUS
PISCES
EQUULEUS
DELPHINUS
CAPRICORNUS
Homam
Biham
Enif
Kitalpha
Sadalmelik
Sadachbia
Sadalsuud
Ancha
Skat
Deneb Algedi
Nashira
Saturn Nebula
7009
M73
M15
M2
7006
7448
Ecliptic
340°
330°
320°
Σ 2841
h 947
Σ 2834
Σ II 11
Cou 430
Σ 2877
OΣΣ 213
Σ 2738
Hu 767
Σ 2797
Σ 2958
OΣ 483
β 163
Σ 2799
Σ 2857
S 798
Σ 2777
Σ 154
Σ 2786
Σ 2878
S 781
Σ 2742
Σ 156
Σ 2848
β pm
Σ 2912
Σ 2735
Σ 2737
Σ 2787
Σ 2936
Σ 2744
Howe 55
Σ 2909
Σ 2809
Σ 2755
Σ 2838
Σ 2944
h 5529
β 172
H N 140
Σ 2745
Σ 2935
Σ 2939
h 616
H VI 97
Σ 2943
h 5355
Sh 345
S 802
β 1036
H VI 6
AG
EE
EP
V
RS

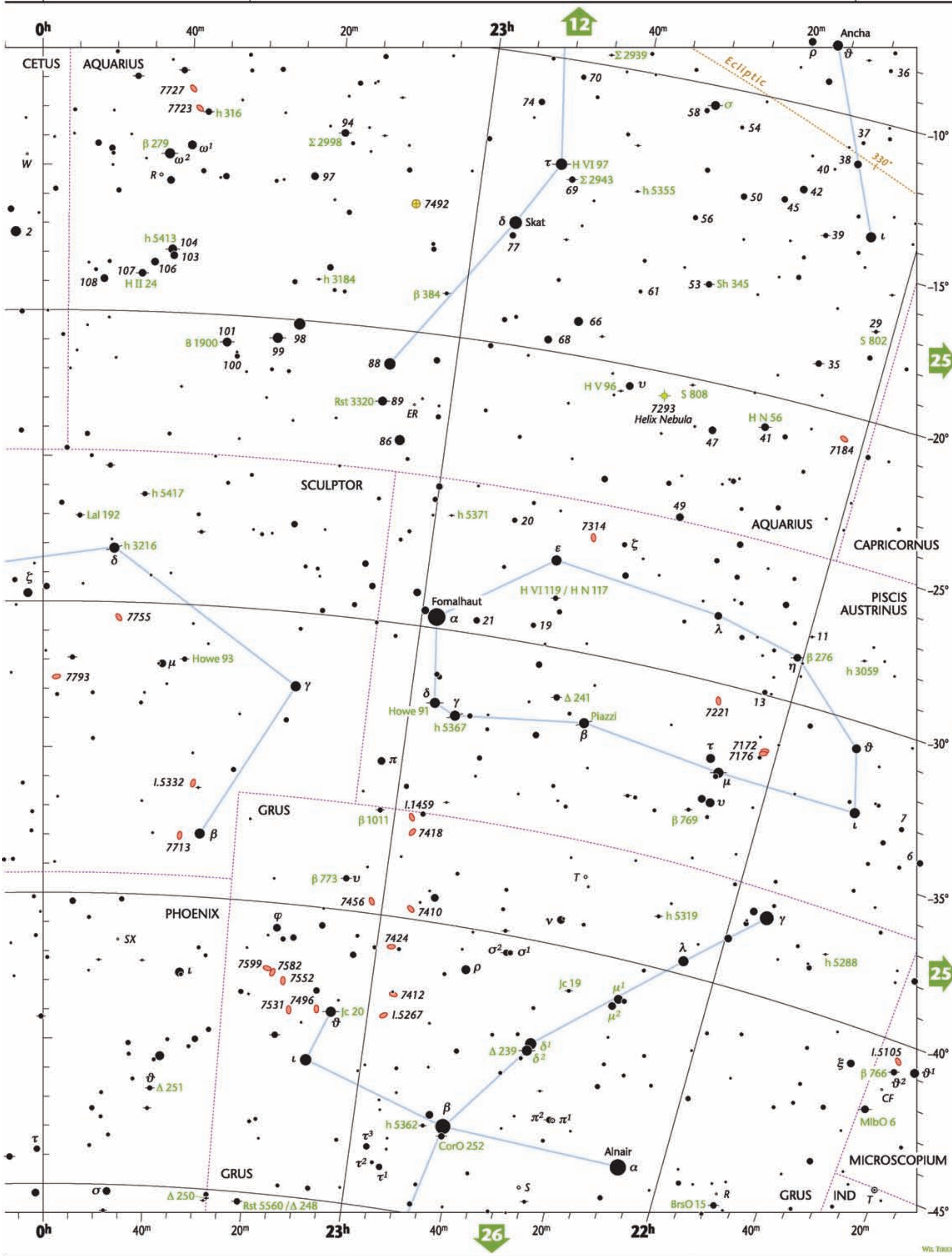

21h
40m
20m
20h
40m
20m
19h
+20°
+15°
+10°
+5°
0°
−5°
−10°
−15°
−20°
11
18
25
Brocchi's Cluster
Cr399
VULPECULA
SAGITTA
DELPHINUS
EQUULEUS
AQUILA
CAPRICORNUS
SAGITTARIUS
AQUARIUS
Altair
Alshain
Tarazed
Albali
Dabih
Algedi
Saturn Nebula
Galactic Equator
Ecliptic
50°
40°
310°

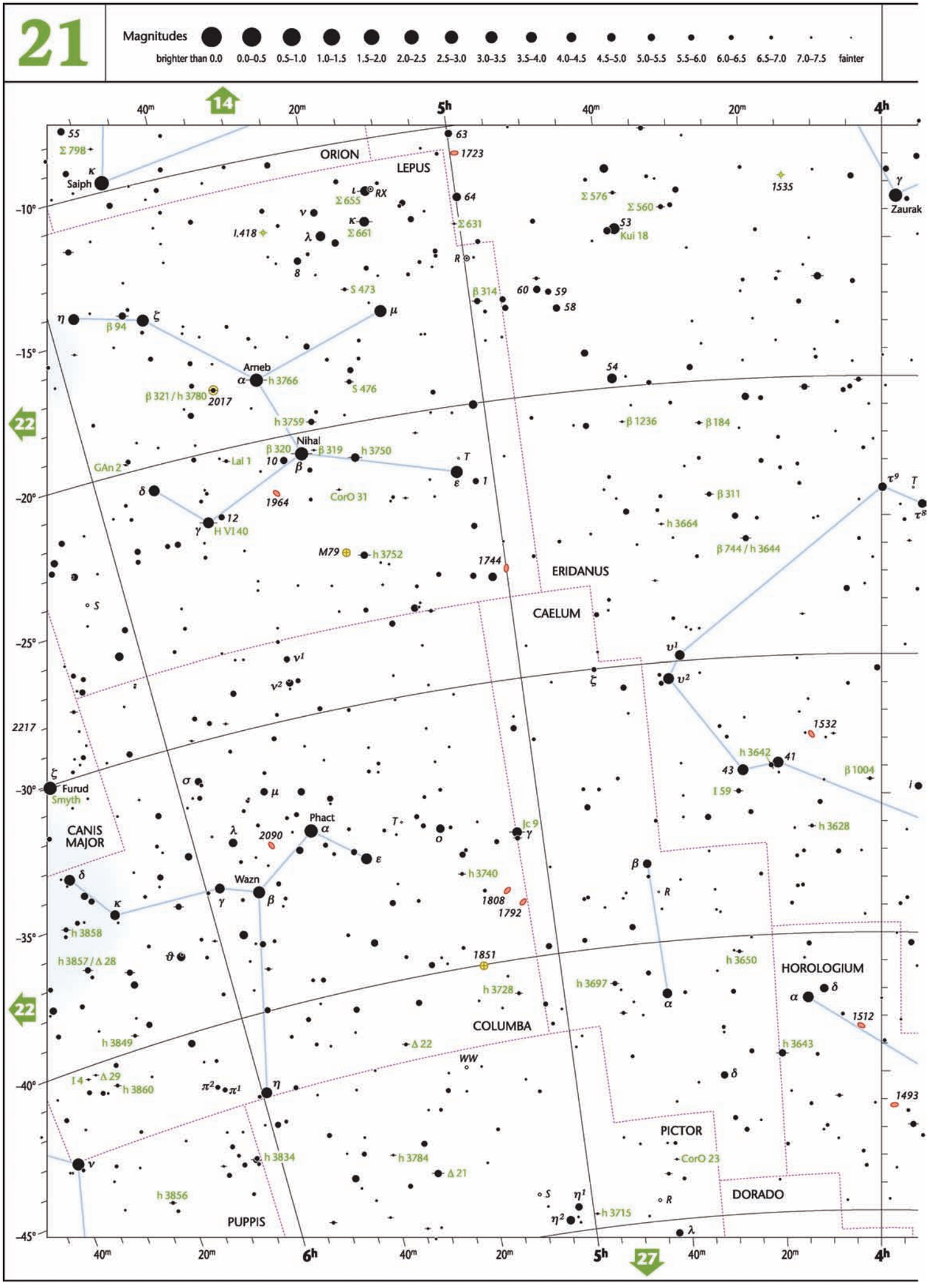
Magnitudes

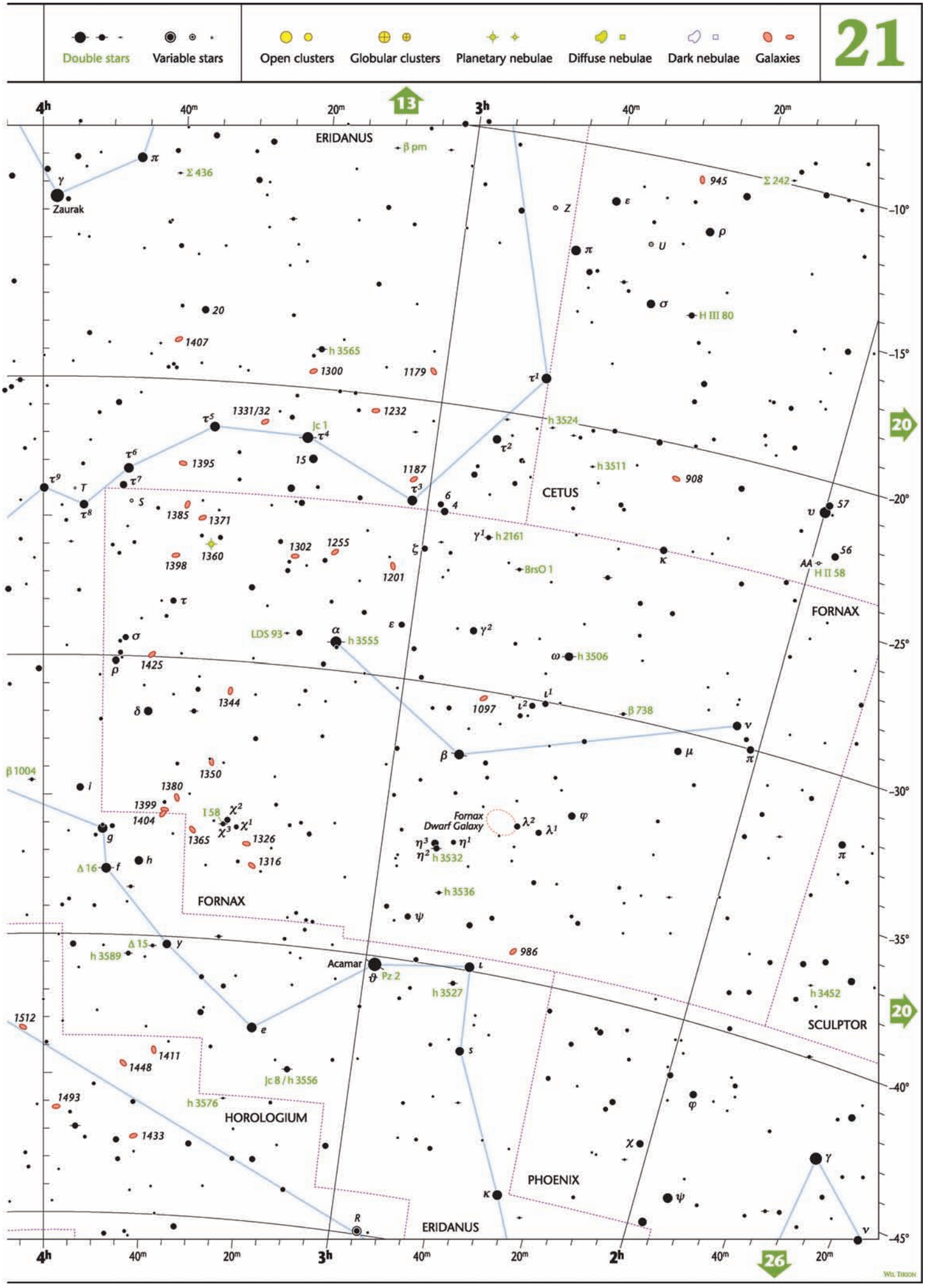
brighter than 0.0 | 0.0–0.5 | 0.5–1.0 | 1.0–1.5 | 1.5–2.0 | 2.0–2.5 | 2.5–3.0 | 3.0–3.5 | 3.5–4.0 | 4.0–4.5 | 4.5–5.0 | 5.0–5.5 | 5.5–6.0 | 6.0–6.5 | 6.5–7.0 | 7.0–7.5 | fainter



Double stars · Variable stars · Open clusters · Globular clusters · Planetary nebulae · Diffuse nebulae · Dark nebulae · Galaxies

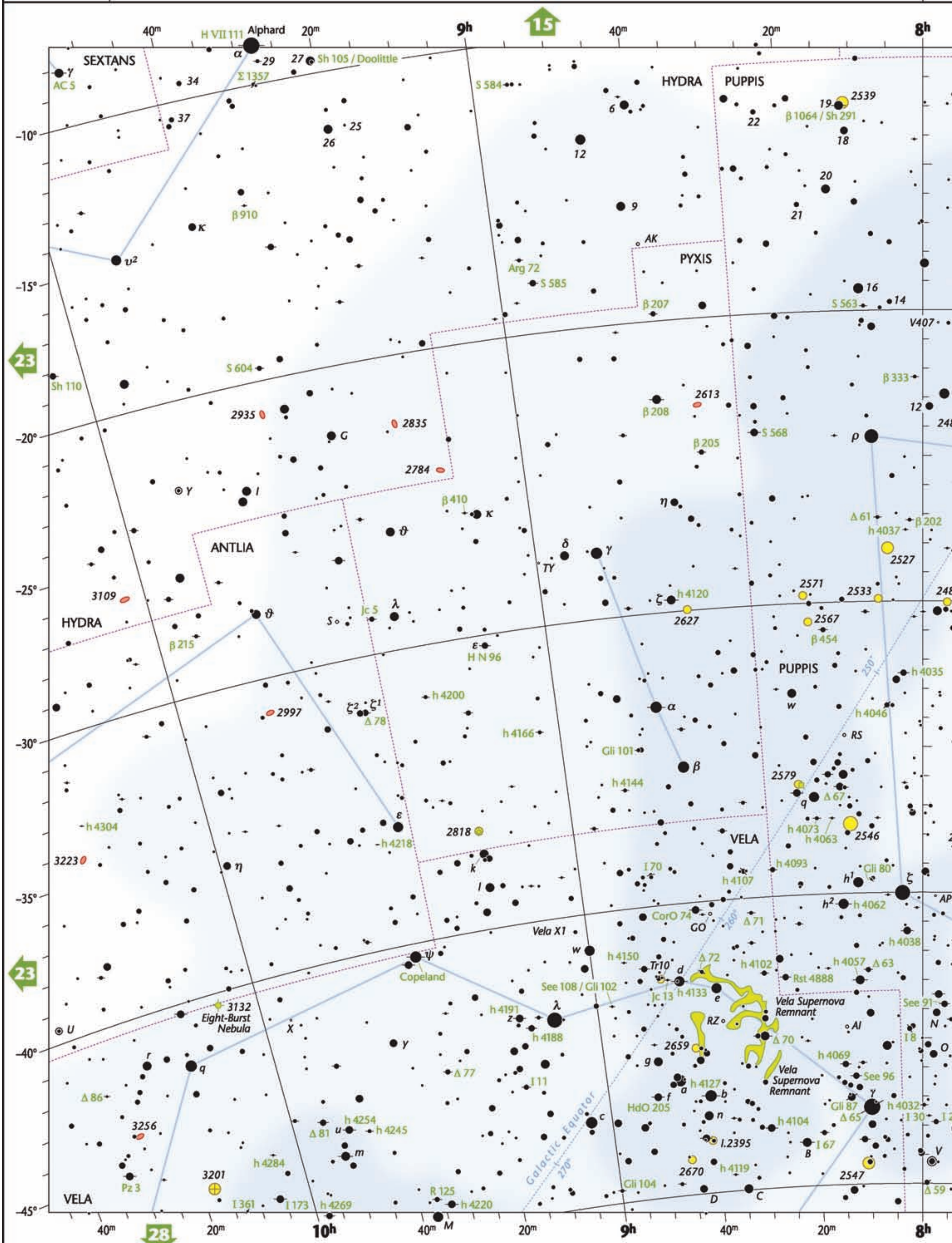

0h
40m
20m
23h
12
40m
20m
Ancha
CETUS
AQUARIUS
SCULPTOR
PISCIS AUSTRINUS
CAPRICORNUS
GRUS
PHOENIX
MICROSCOPIUM
IND
Ecliptic
330°
–10°
–15°
–20°
–25°
–30°
–35°
–40°
–45°
25
26
Skat
Fomalhaut
Alnair
Piazzi
Helix Nebula
7293
7492
7727
7723
7755
7793
7713
7314
7221
7172
7176
7184
7418
7456
7410
7424
7599
7582
7552
7531
7496
7412
I.5267
I.5332
I.1459
I.5105
h 316
β 279
Σ 2998
Σ 2939
Σ 2943
H VI 97
h 5355
h 5413
H II 24
h 3184
β 384
Sh 345
S 802
B 1900
Rst 3320
H V 96
S 808
H N 56
h 5417
Lal 192
h 5371
h 3216
H VI 119 / H N 117
Howe 93
β 276
h 3059
Δ 241
Howe 91
h 5367
β 1011
β 769
β 773
h 5319
h 5288
Jc 19
Jc 20
Δ 239
Δ 251
β 766
MlbO 6
h 5362
CorO 252
Δ 250
Rst 5560 / Δ 248
BrsO 15
0h
40m
20m
23h
40m
20m
22h
40m
20m
Wil Tirion


21
Magnitudes
brighter than 0.0
0.0–0.5
0.5–1.0
1.0–1.5
1.5–2.0
2.0–2.5
2.5–3.0
3.0–3.5
3.5–4.0
4.0–4.5
4.5–5.0
5.0–5.5
5.5–6.0
6.0–6.5
6.5–7.0
7.0–7.5
fainter
40m
20m
5h
40m
20m
4h
14
22
22
27
−10°
−15°
−20°
−25°
−30°
−35°
−40°
−45°
2217
ORION
LEPUS
ERIDANUS
CAELUM
CANIS MAJOR
COLUMBA
PUPPIS
PICTOR
DORADO
HOROLOGIUM
Saiph
Arneb
Nihal
Furud
Smyth
Phact
Wazn
Zaurak
Kui 18
CorO 31
H VI 40
GAn 2
Lal 1
M79
CorO 23
55
Σ 798
63
1723
64
Σ 655
RX
Σ 631
Σ 661
1.418
Σ 576
Σ 560
53
1535
S 473
β 314
60
59
58
β 94
54
S 476
β 321 / h 3780
2017
h 3759
β 1236
β 184
β 320
β 319
h 3750
10
1964
1
β 311
h 3664
β 744 / h 3644
12
h 3752
1744
1532
h 3642
41
43
β 1004
I 59
h 3628
2090
Jc 9
h 3740
1808
1792
h 3858
h 3857 / Δ 28
1851
h 3650
h 3697
1512
h 3728
h 3849
Δ 22
WW
h 3643
I 4
Δ 29
h 3860
1493
h 3834
h 3784
Δ 21
h 3856
h 3715


Double stars
Variable stars
Open clusters
Globular clusters
Planetary nebulae
Diffuse nebulae
Dark nebulae
Galaxies
4h
40m
20m
13
3h
40m
20m
ERIDANUS
β pm
Σ 436
Zaurak
γ
π
945
Σ 242
Z
ε
ρ
U
π
σ
H III 80
20
1407
h 3565
1300
1179
τ1
1331/32
1232
τ5
Jc 1
τ4
h 3524
τ6
1395
15
τ2
h 3511
908
1187
τ9
T
τ7
τ3
CETUS
τ8
S
6
4
57
υ
1385
1371
γ1
h 2161
1360
1302
1255
ζ
κ
56
AA
H II 58
1398
1201
BrsO 1
τ
FORNAX
ε
γ2
σ
LDS 93
α
h 3555
ω
h 3506
ρ
1425
1344
δ
1097
ι1
ι2
β 738
ν
β
μ
π
β 1004
1350
i
1380
1399
1404
I 58
χ2
χ3
χ1
Fornax
Dwarf Galaxy
λ2
λ1
φ
η3
η1
η2
h 3532
g
1365
1326
Δ 16
f
h
1316
h 3536
FORNAX
ψ
Δ 15
y
h 3589
986
Acamar
ι
ϑ Pz 2
h 3527
h 3452
20
SCULPTOR
1512
e
s
1411
1448
Jc 8 / h 3556
1493
h 3576
HOROLOGIUM
1433
χ
γ
PHOENIX
κ
ψ
ν
R
ERIDANUS
2h
40m
20m
26
−10°
−15°
−20°
−25°
−30°
−35°
−40°
−45°

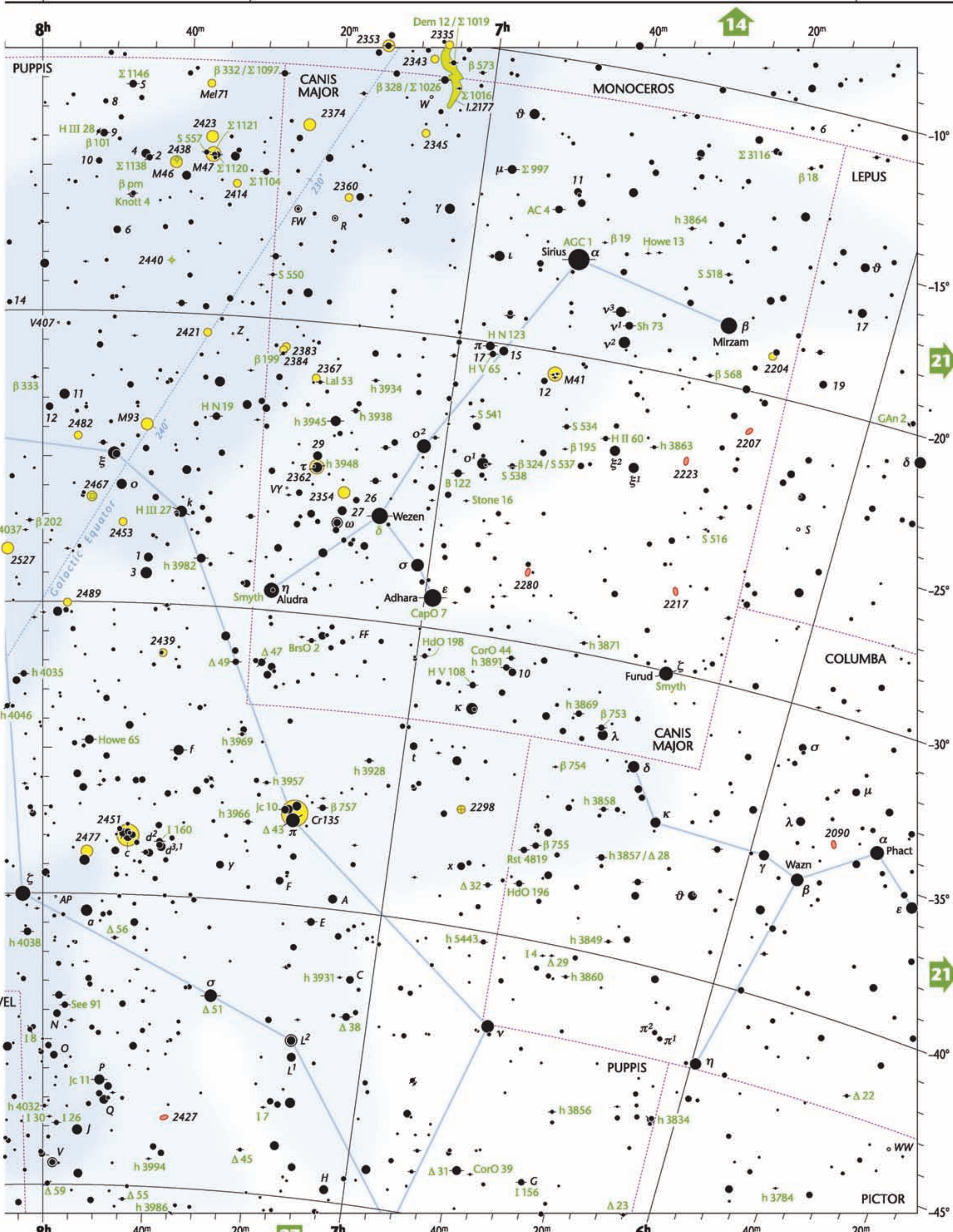
22

Magnitudes: brighter than 0.0 · 0.0–0.5 · 0.5–1.0 · 1.0–1.5 · 1.5–2.0 · 2.0–2.5 · 2.5–3.0 · 3.0–3.5 · 3.5–4.0 · 4.0–4.5 · 4.5–5.0 · 5.0–5.5 · 5.5–6.0 · 6.0–6.5 · 6.5–7.0 · 7.0–7.5 · fainter



15
23
23
28
40m
20m
9h
40m
20m
8h
10h
−10°
−15°
−20°
−25°
−30°
−35°
−40°
−45°
SEXTANS
HYDRA
PUPPIS
PYXIS
ANTLIA
HYDRA
VELA
PUPPIS
VELA
Alphard
H VII 111
Σ 1357
27
Sh 105 / Doolittle
AC 5
S 584
β 1064 / Sh 291
2539
β 910
Arg 72
S 585
β 207
S 563
V407
S 604
Sh 110
β 333
2935
2835
2613
β 208
2784
S 568
β 205
2482
β 410
Δ 61
h 4037
β 202
2527
3109
Jc 5
h 4120
2571
2533
2489
2627
2567
β 454
β 215
H N 96
h 4035
h 4200
2997
Δ 78
h 4166
h 4046
Gli 101
RS
h 4144
2579
Δ 67
h 4304
2818
h 4218
h 4073
h 4063
2546
3223
I 70
h 4093
h 4107
Gli 80
h 4062
CorO 74
Δ 71
Vela X1
h 4038
h 4150
Tr10
Δ 72
h 4102
h 4057
Δ 63
Rst 4888
Copeland
See 108 / Gli 102
Jc 13
h 4133
3132
Eight-Burst Nebula
h 4191
h 4188
Vela Supernova Remnant
See 91
2659
Δ 70
h 4069
Δ 77
h 4127
See 96
Δ 86
I 11
HdO 205
Gli 87
Δ 65
h 4032
I 30
h 4254
h 4245
h 4104
3256
Δ 81
I.2395
I 67
h 4284
Galactic Equator
2670
h 4119
2547
3201
Pz 3
R 125
h 4220
Gli 104
I 361
I 173
h 4269
Δ 59
250°
260°
270°

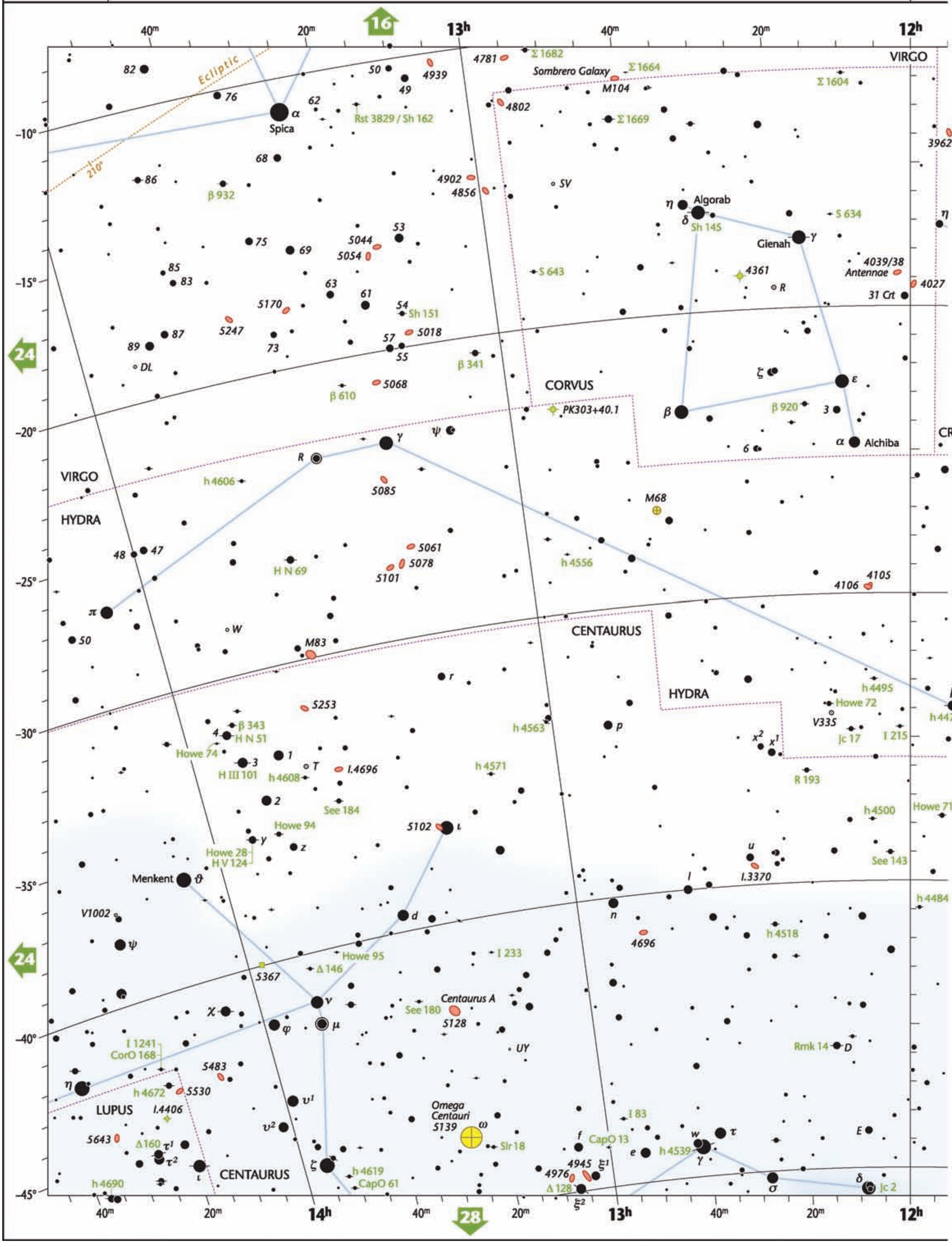
Double stars | Variable stars | Open clusters | Globular clusters | Planetary nebulae | Diffuse nebulae | Dark nebulae | Galaxies



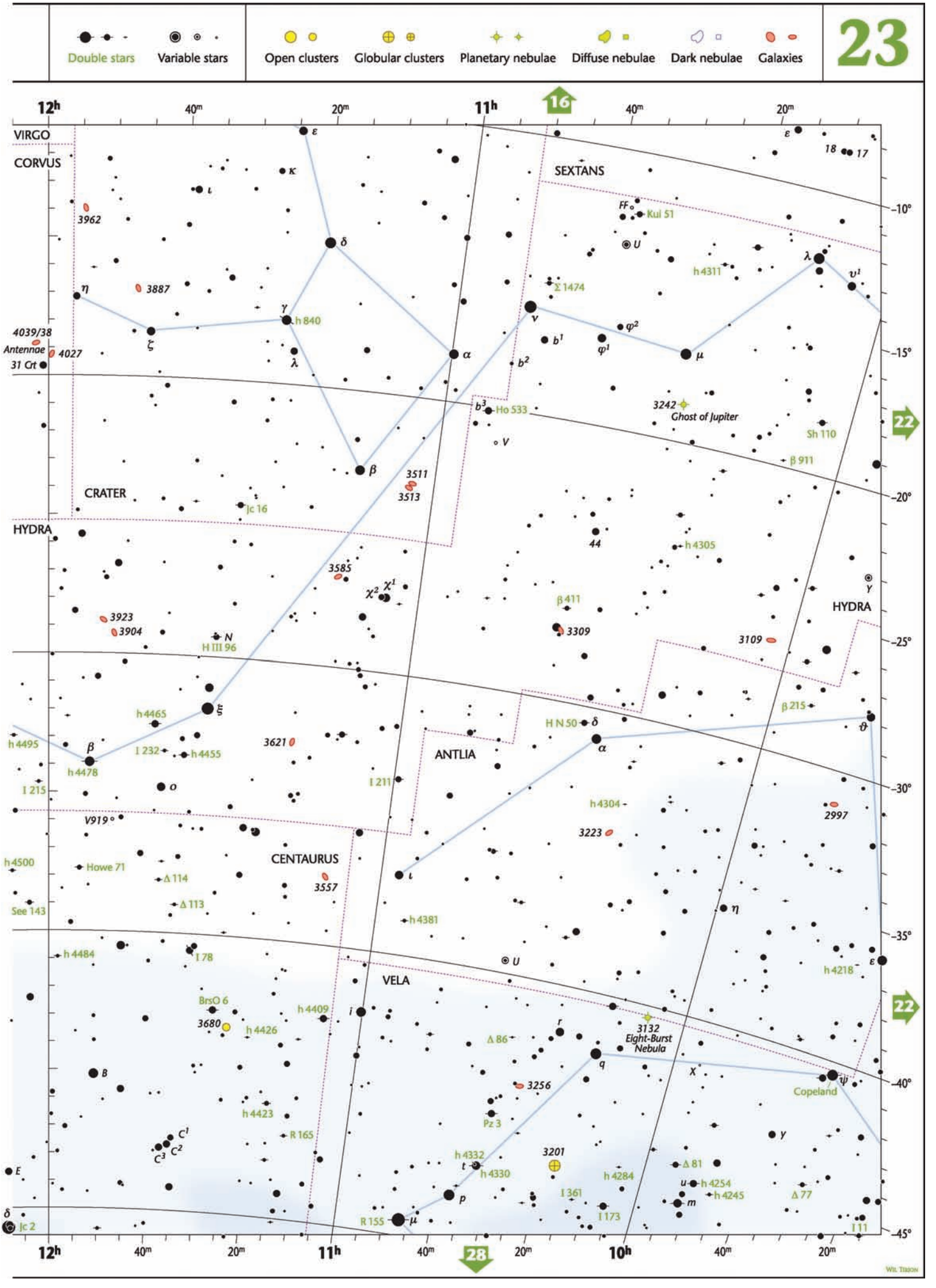
14
21
27
8h
7h
6h
40m
20m
−10°
−15°
−20°
−25°
−30°
−35°
−40°
−45°
PUPPIS
CANIS MAJOR
MONOCEROS
LEPUS
COLUMBA
CANIS MAJOR
PUPPIS
VEL
PICTOR
Galactic Equator
230°
240°
Sirius
Mirzam
Wezen
Adhara
Aludra
Furud
Wazn
Phact
AGC 1
M41
M46
M47
M93
Mel71
Cr135
Dem 12 / Σ 1019
β 332 / Σ 1097
β 328 / Σ 1026
Σ 1016
I.2177
β 573
2335
2343
2345
2353
2360
2374
2383
2384
2367
Lal 53
2421
2423
2438
2414
2440
2482
2467
2453
2527
2489
2439
2451
2477
2427
2298
2362
2354
2280
2217
2223
2207
2204
2090
Σ 1146
Σ 1121
Σ 1120
Σ 1138
Σ 1104
S 557
H III 28
β 101
β pm
Knott 4
S 550
Σ 997
Σ 3116
β 18
AC 4
h 3864
β 19
Howe 13
S 518
H N 123
H V 65
Sh 73
β 568
β 199
h 3934
h 3938
h 3945
H N 19
S 541
S 534
H II 60
h 3863
β 195
β 324 / S 537
S 538
h 3948
B 122
Stone 16
S 516
H III 27
h 3982
β 202
h 4037
β 333
GAn 2
Smyth
CapO 7
HdO 198
CorO 44
h 3891
H V 108
h 3871
BrsO 2
Δ 47
Δ 49
h 4035
h 4046
Howe 65
h 3969
h 3869
β 753
h 3928
h 3957
β 754
Jc 10
β 757
h 3966
Δ 43
I 160
h 3858
β 755
Rst 4819
h 3857 / Δ 28
Δ 32
HdO 196
Δ 56
h 4038
h 5443
h 3849
I 4
Δ 29
h 3860
h 3931
See 91
Δ 51
Δ 38
I 8
Jc 11
h 4032
I 30
I 26
I 7
h 3856
h 3834
Δ 22
h 3994
Δ 45
Δ 31
CorO 39
I 156
Δ 59
Δ 55
h 3986
Δ 23
h 3784
WW
V407
FW
R
FF
Wil Tirion

23

Magnitudes: brighter than 0.0 · 0.0–0.5 · 0.5–1.0 · 1.0–1.5 · 1.5–2.0 · 2.0–2.5 · 2.5–3.0 · 3.0–3.5 · 3.5–4.0 · 4.0–4.5 · 4.5–5.0 · 5.0–5.5 · 5.5–6.0 · 6.0–6.5 · 6.5–7.0 · 7.0–7.5 · fainter

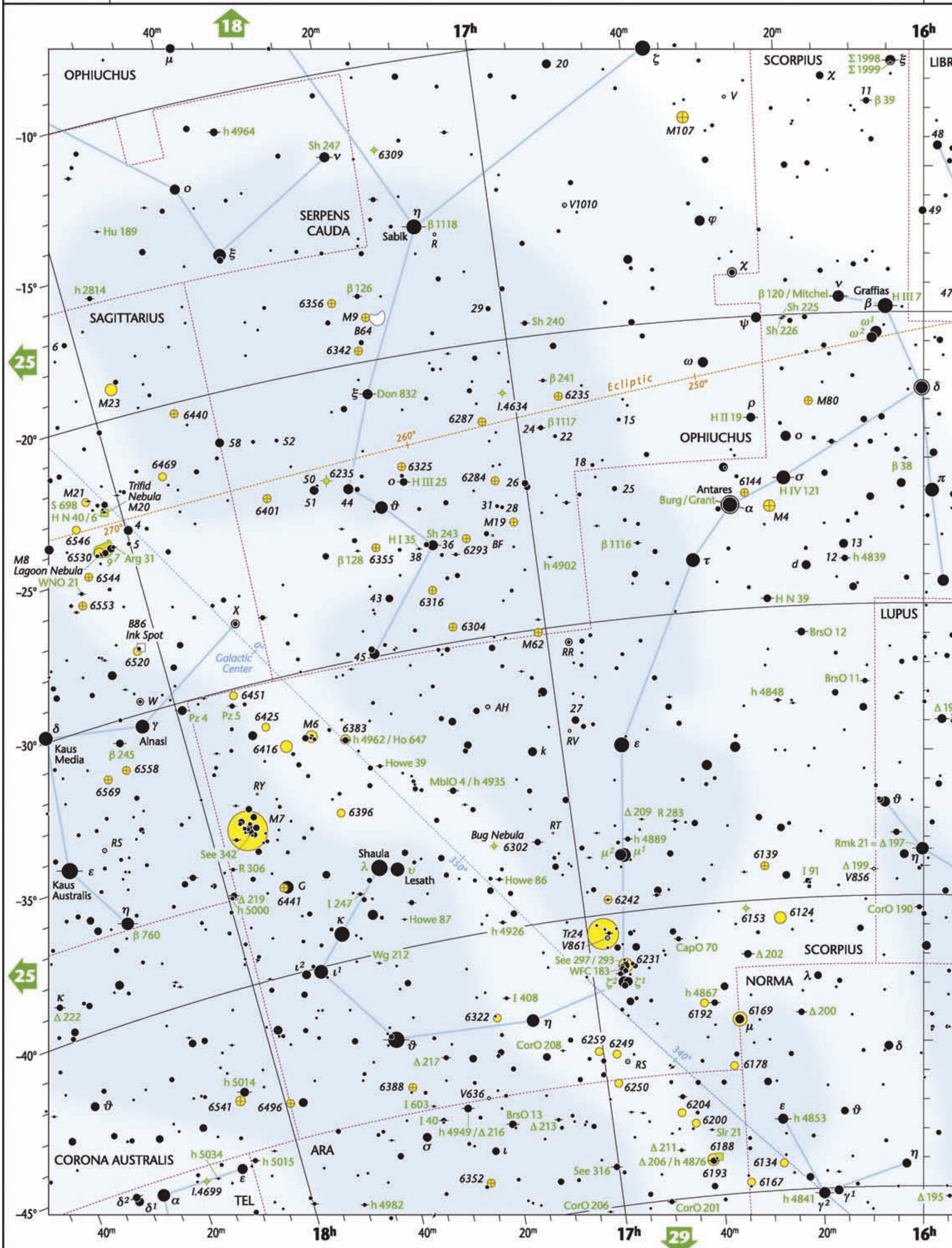


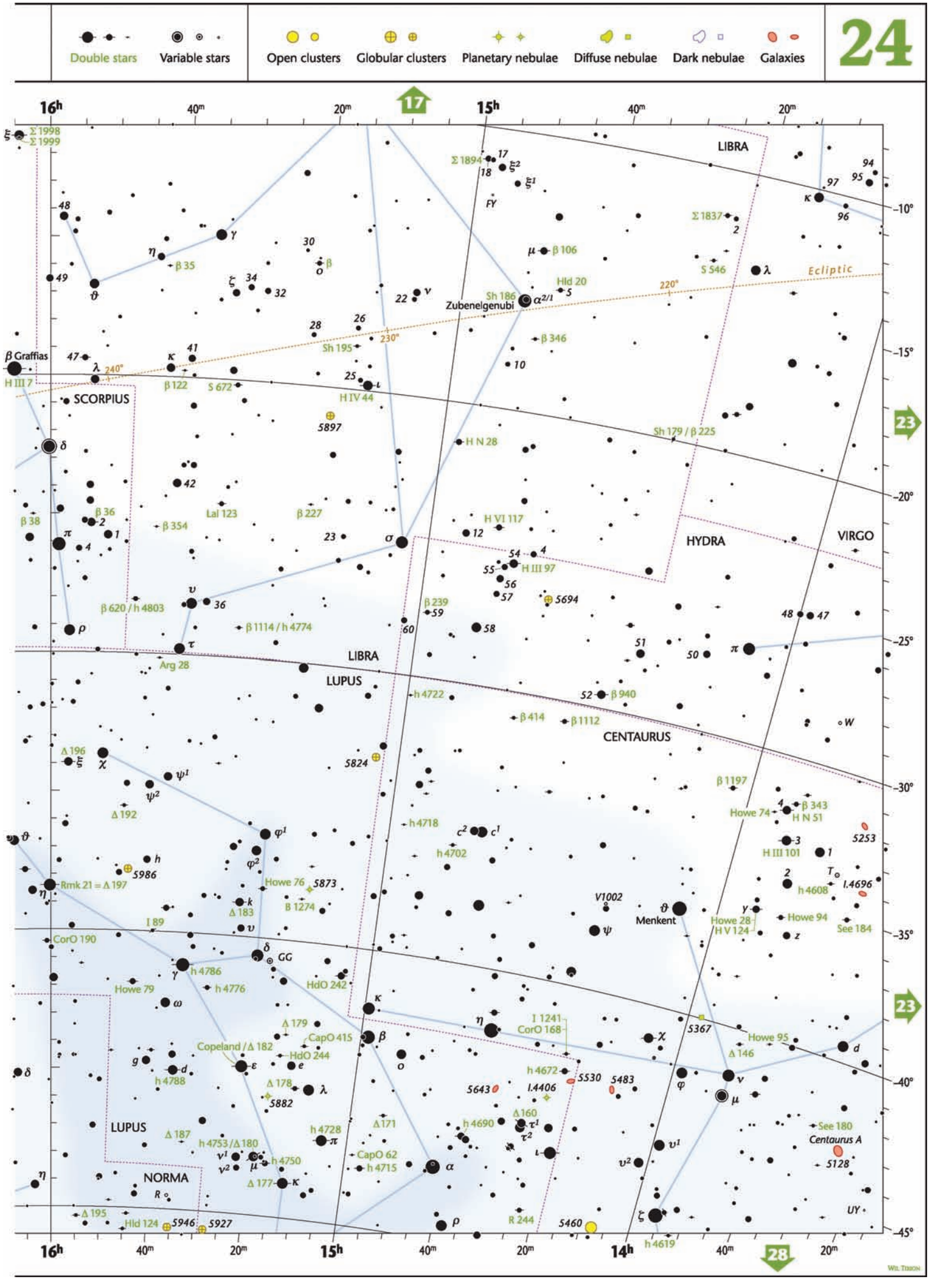
16
24
28
13h
12h
14h
40m
20m
-10°
-15°
-20°
-25°
-30°
-35°
-40°
-45°
Ecliptic
210°
VIRGO
CORVUS
CRT
HYDRA
CENTAURUS
LUPUS
Spica
Algorab
Gienah
Alchiba
Menkent
Sombrero Galaxy
M104
Antennae
4039/38
M68
M83
Centaurus A
5128
Omega Centauri
5139
PK303+40.1
Rst 3829 / Sh 162
Σ 1682
Σ 1664
Σ 1604
Σ 1669
S 634
S 643
Sh 145
Sh 151
β 932
β 341
β 610
β 920
β 343
h 4606
H N 69
H N 51
H III 101
h 4556
h 4563
h 4571
h 4608
See 184
Howe 74
Howe 94
Howe 28
H V 124
Howe 95
Δ 146
I 233
See 180
I 1241
CorO 168
h 4672
I.4406
Δ 160
h 4690
h 4619
CapO 61
Slr 18
I 83
CapO 13
h 4539
Δ 128
h 4495
Howe 72
V335
Jc 17
I 215
h 4478
R 193
h 4500
Howe 71
See 143
h 4484
h 4518
Rmk 14
Jc 2
4781
4939
4802
4902
4856
5044
5054
5170
5247
5018
5068
5085
5061
5078
5101
4105
4106
3962
4027
31 Crt
4361
5253
I.4696
5102
I.3370
4696
5367
5483
5530
5643
4976
4945
SV
DL
W
T
UY


Double stars
Variable stars
Open clusters
Globular clusters
Planetary nebulae
Diffuse nebulae
Dark nebulae
Galaxies
23
12h
40m
20m
11h
16
VIRGO
CORVUS
SEXTANS
CRATER
HYDRA
ANTLIA
CENTAURUS
VELA
22
28
10h
-10°
-15°
-20°
-25°
-30°
-35°
-40°
-45°
3962
3887
4039/38
Antennae
4027
31 Crt
h 840
Kui 51
h 4311
Σ 1474
3242
Ghost of Jupiter
Ho 533
Sh 110
β 911
3511
3513
Jc 16
44
h 4305
3585
β 411
3309
3109
3923
3904
H III 96
h 4465
h 4495
h 4478
I 232
h 4455
3621
β 215
H N 50
I 215
I 211
h 4304
2997
3223
V919
h 4500
Howe 71
Δ 114
Δ 113
3557
See 143
h 4381
h 4484
I 78
h 4218
BrsO 6
3680
h 4426
h 4409
Δ 86
3132
Eight-Burst
Nebula
3256
Copeland
h 4423
R 165
Pz 3
3201
h 4332
h 4330
h 4284
Δ 81
h 4254
h 4245
Δ 77
I 361
I 173
R 155
Jc 2
I 11
Wil Tirion

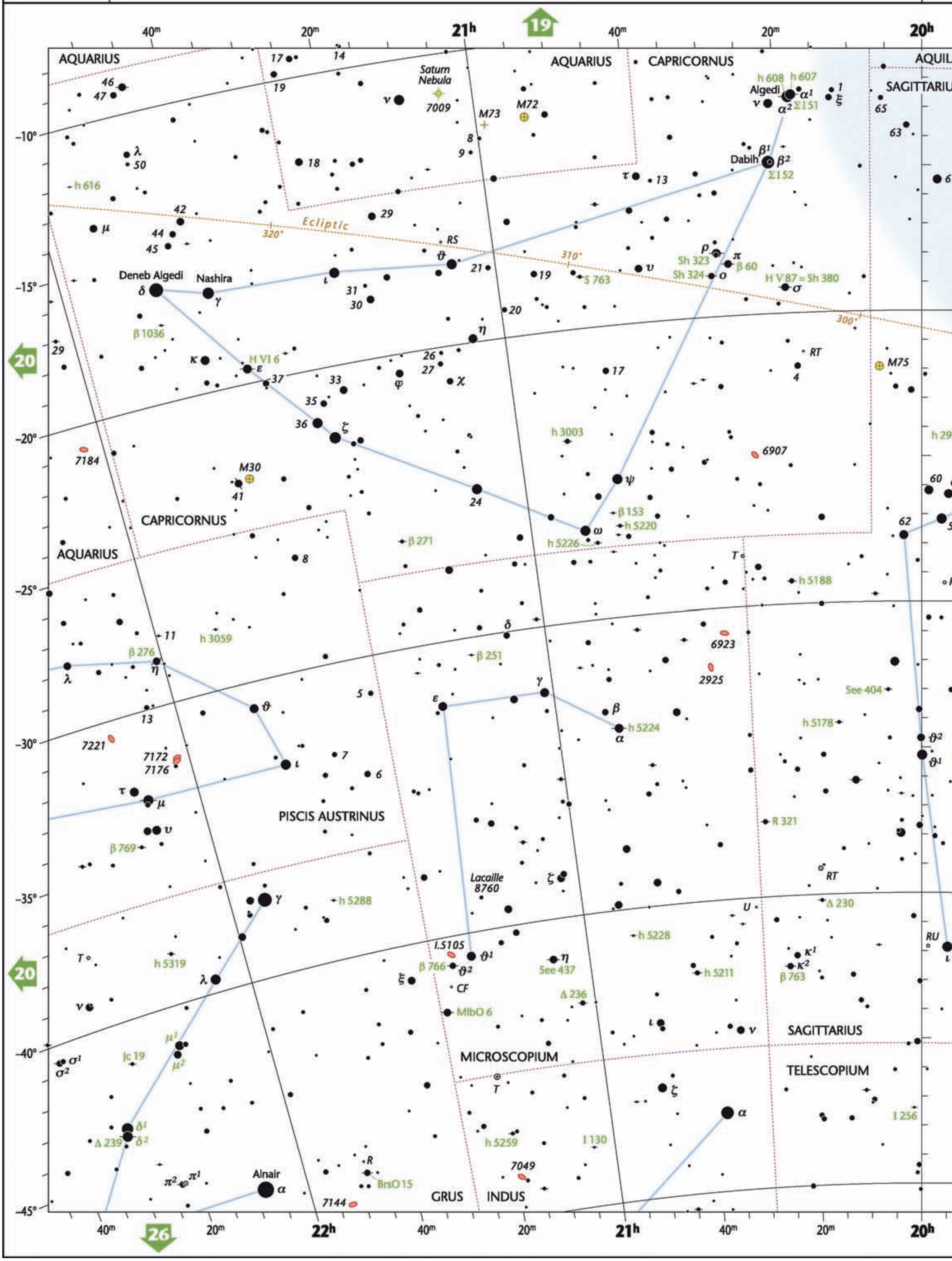
24

Magnitudes: brighter than 0.0 · 0.0–0.5 · 0.5–1.0 · 1.0–1.5 · 1.5–2.0 · 2.0–2.5 · 2.5–3.0 · 3.0–3.5 · 3.5–4.0 · 4.0–4.5 · 4.5–5.0 · 5.0–5.5 · 5.5–6.0 · 6.0–6.5 · 6.5–7.0 · 7.0–7.5 · fainter

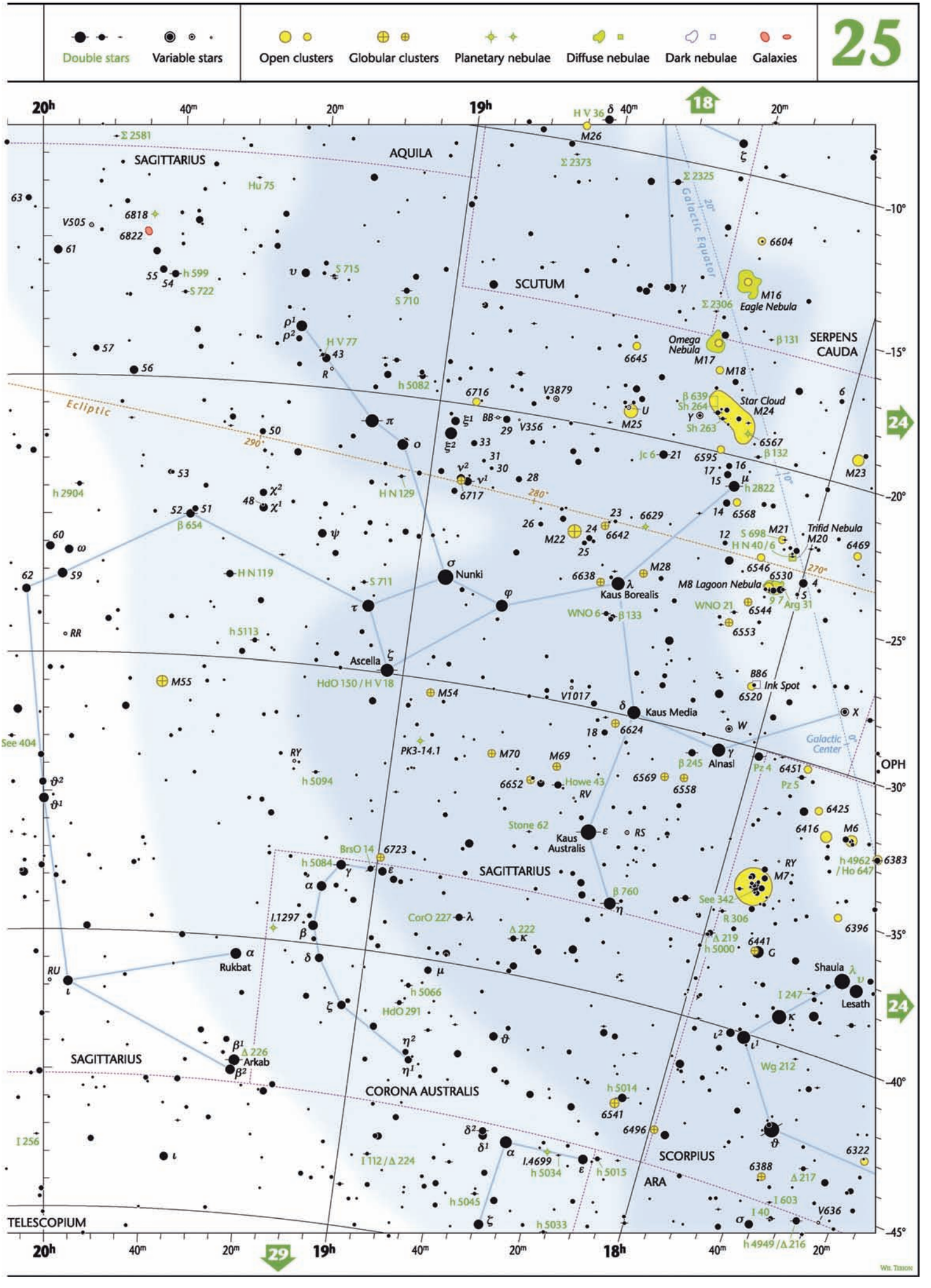



Double stars
Variable stars
Open clusters
Globular clusters
Planetary nebulae
Diffuse nebulae
Dark nebulae
Galaxies
24
16h
40m
20m
17
15h
40m
20m
LIBRA
SCORPIUS
HYDRA
VIRGO
LIBRA
LUPUS
CENTAURUS
LUPUS
NORMA
Ecliptic
Zubenelgenubi
β Graffias
Menkent
Centaurus A
23
23
28
14h
40m
20m
16h
40m
20m
15h
40m
20m
-10°
-15°
-20°
-25°
-30°
-35°
-40°
-45°

Magnitudes																
brighter than 0.0	0.0–0.5	0.5–1.0	1.0–1.5	1.5–2.0	2.0–2.5	2.5–3.0	3.0–3.5	3.5–4.0	4.0–4.5	4.5–5.0	5.0–5.5	5.5–6.0	6.0–6.5	6.5–7.0	7.0–7.5	fainter

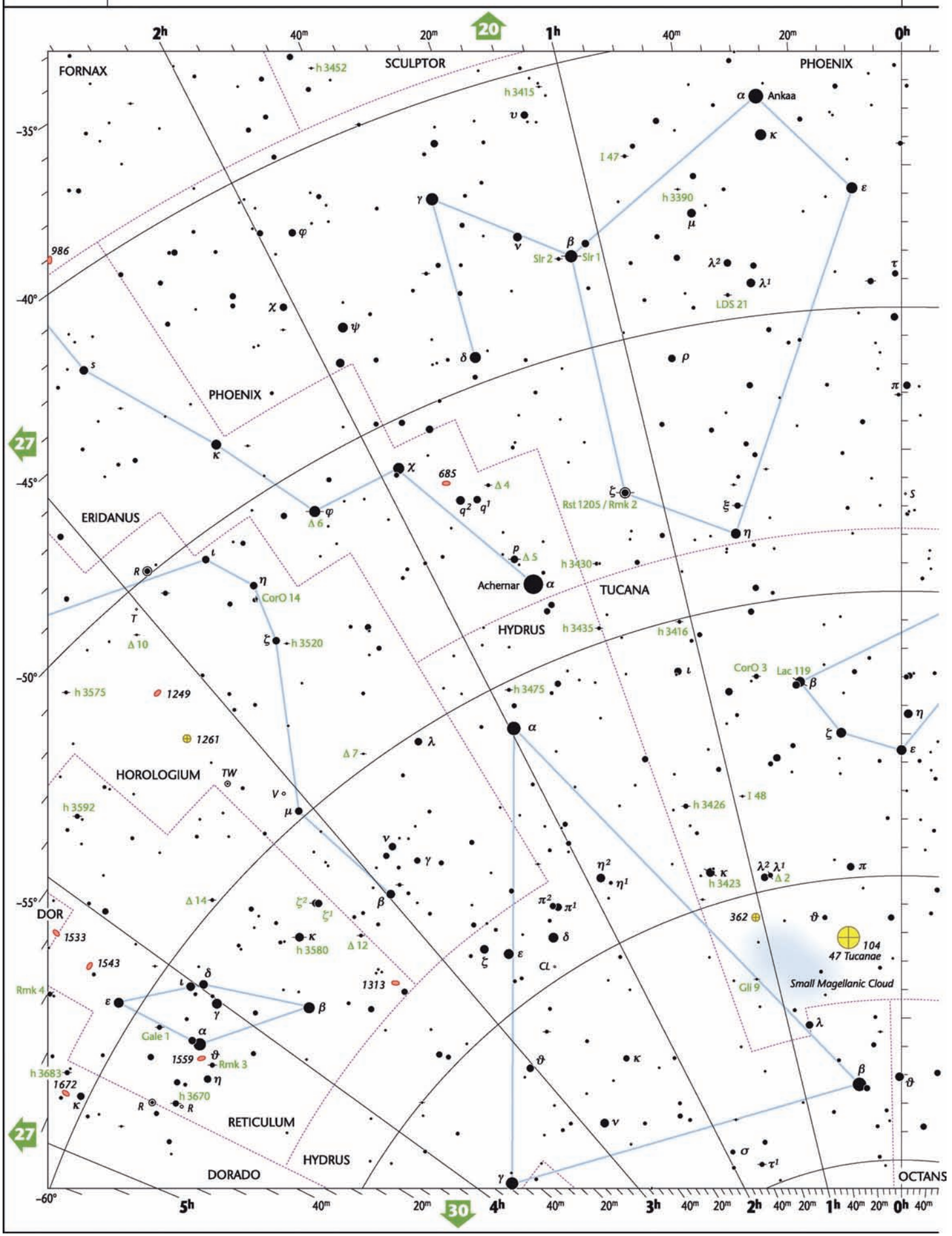


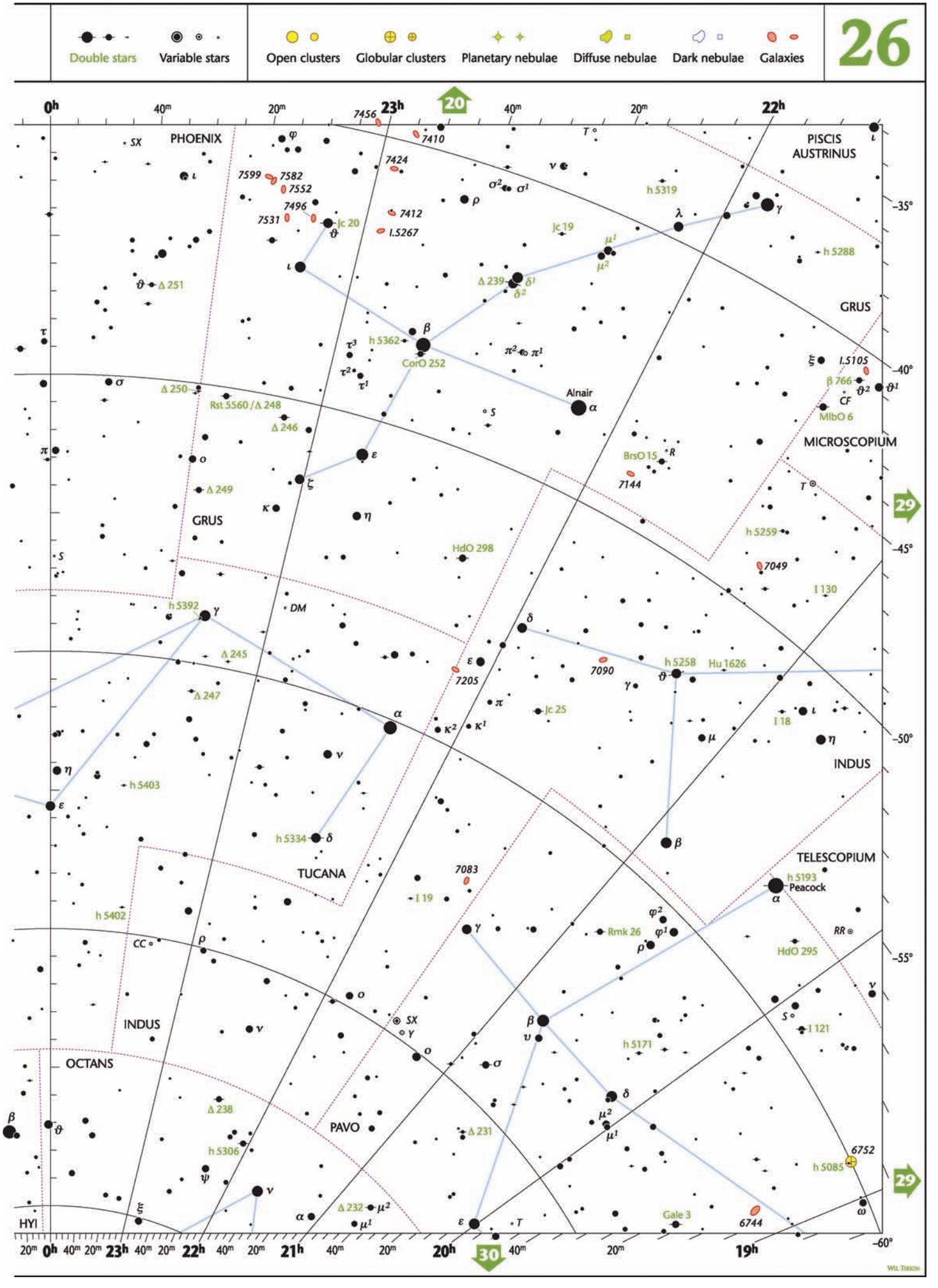
AQUARIUS
CAPRICORNUS
AQUILA
SAGITTARIUS
PISCIS AUSTRINUS
MICROSCOPIUM
TELESCOPIUM
GRUS
INDUS
19
20
26
21h
22h
20h
40m
20m
-10°
-15°
-20°
-25°
-30°
-35°
-40°
-45°
Ecliptic
320°
310°
300°
Saturn Nebula
7009
M73
M72
M30
M75
Deneb Algedi
Nashira
Algedi
Dabih
Alnair
Lacaille 8760
h 608
h 607
Σ151
Σ152
h 616
β 1036
H VI 6
Sh 323
Sh 324
β 60
S 763
H V 87 = Sh 380
h 3003
6907
7184
β 153
h 5220
h 5226
β 271
h 5188
h 3059
β 276
6923
2925
β 251
h 5224
See 404
h 5178
7221
7172
7176
R 321
β 769
h 5288
Δ 230
h 5228
h 5319
I.5105
β 766
See 437
h 5211
β 763
Δ 236
MlbO 6
Jc 19
Δ 239
h 5259
I 130
I 256
7049
BrsO 15
7144
h 2904
CF
RS
RT
RR
RU


Double stars
Variable stars
Open clusters
Globular clusters
Planetary nebulae
Diffuse nebulae
Dark nebulae
Galaxies
25
20h
40m
20m
19h
18
18h
29
24
SAGITTARIUS
AQUILA
SCUTUM
SERPENS CAUDA
OPH
CORONA AUSTRALIS
SCORPIUS
ARA
TELESCOPIUM
Ecliptic
Galactic Equator
Galactic Center
Eagle Nebula
Omega Nebula
Star Cloud
Trifid Nebula
M8 Lagoon Nebula
Ink Spot
Nunki
Ascella
Kaus Borealis
Kaus Media
Kaus Australis
Alnasl
Rukbat
Arkab
Shaula
Lesath
See 404
See 342
-10°
-15°
-20°
-25°
-30°
-35°
-40°
-45°

Magnitudes

brighter than 0.0 | 0.0–0.5 | 0.5–1.0 | 1.0–1.5 | 1.5–2.0 | 2.0–2.5 | 2.5–3.0 | 3.0–3.5 | 3.5–4.0 | 4.0–4.5 | 4.5–5.0 | 5.0–5.5 | 5.5–6.0 | 6.0–6.5 | 6.5–7.0 | 7.0–7.5 | fainter

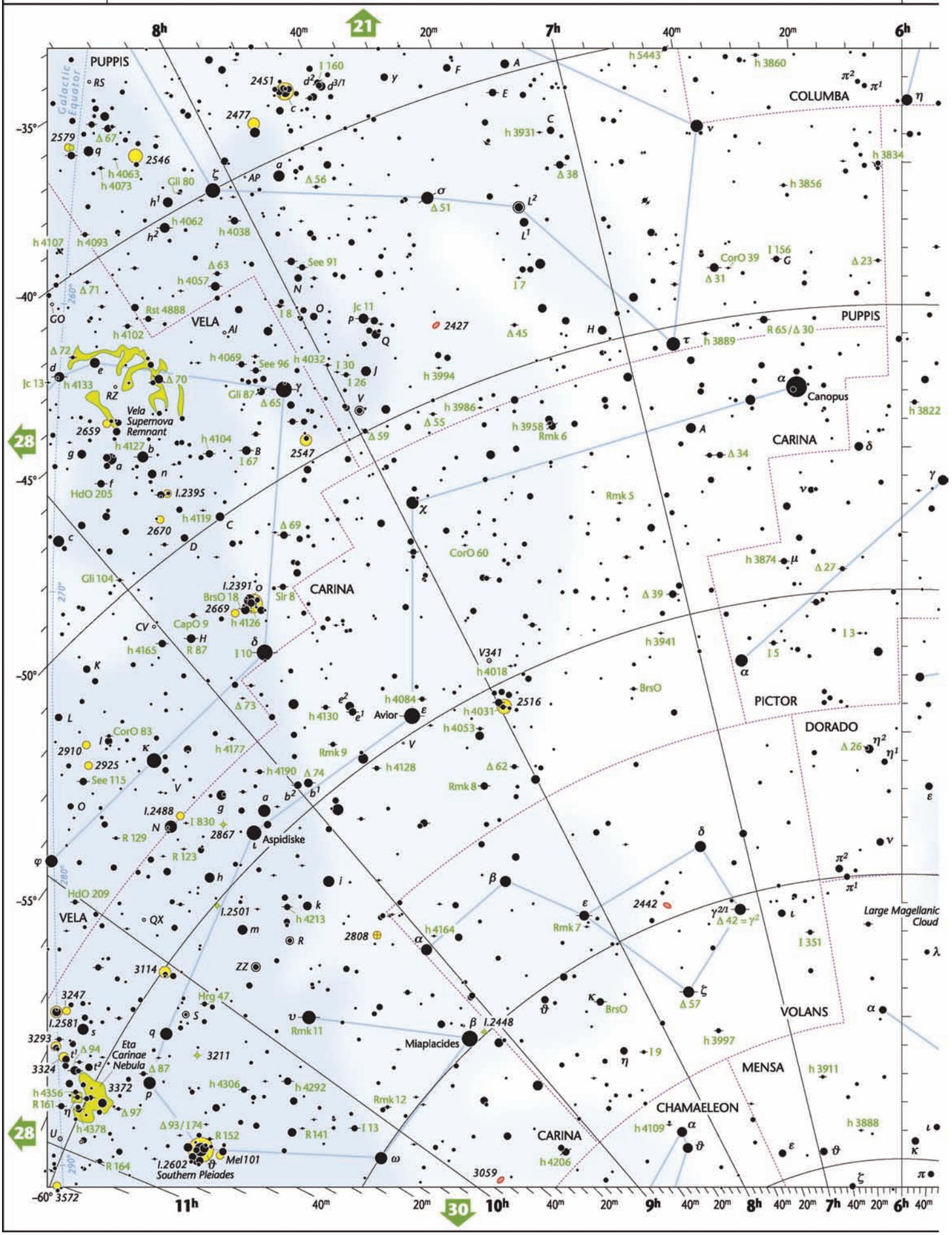


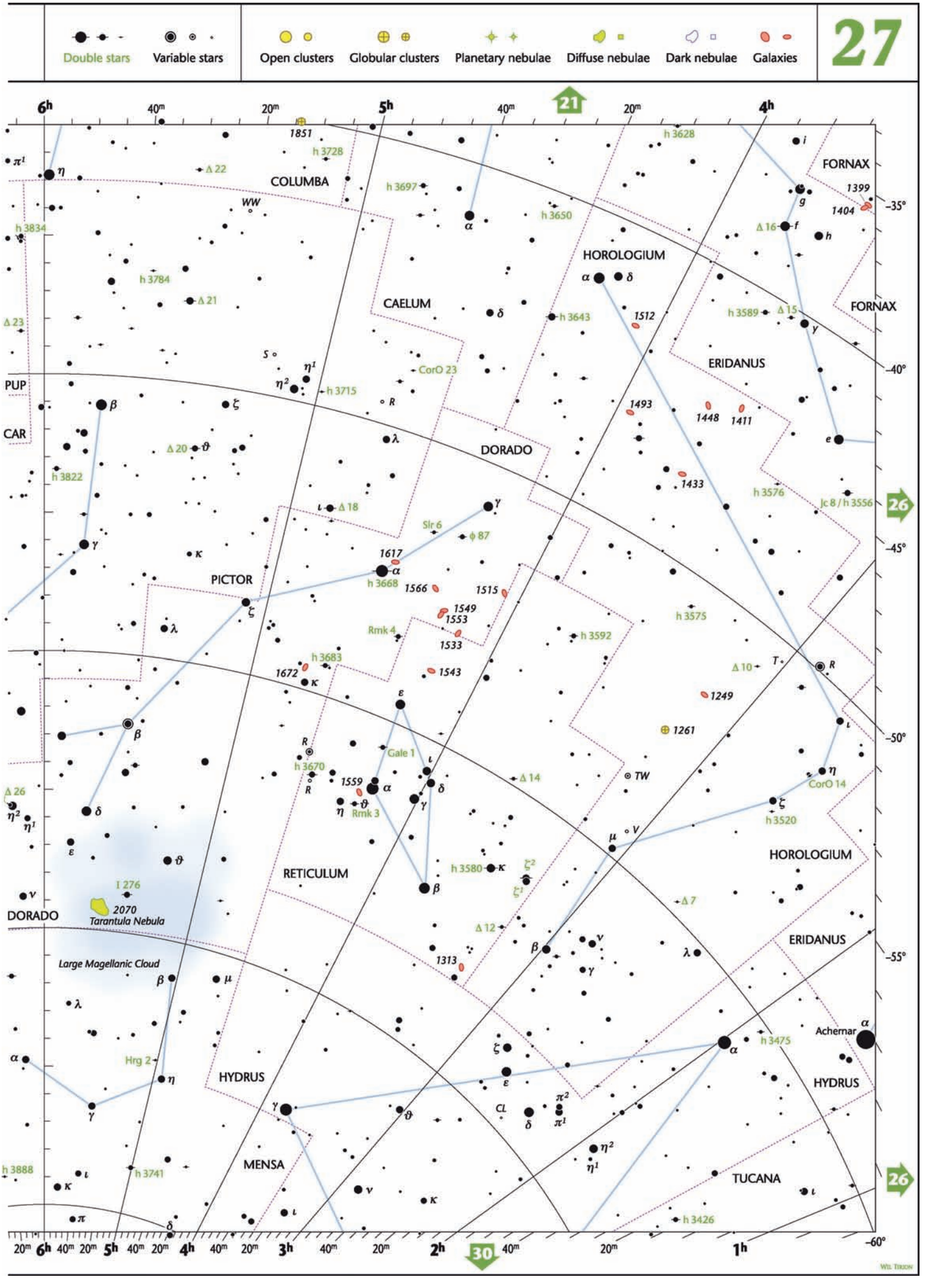

Double stars
Variable stars
Open clusters
Globular clusters
Planetary nebulae
Diffuse nebulae
Dark nebulae
Galaxies
PHOENIX
PISCIS AUSTRINUS
GRUS
MICROSCOPIUM
INDUS
TELESCOPIUM
TUCANA
OCTANS
PAVO
HYI
Alnair
CorO 252
HdO 298
Rmk 26
HdO 295
Peacock
Hu 1626
Jc 19
Jc 20
Jc 25
Rst 5560 / Δ 248
MlbO 6
BrsO 15
Gale 3
0h
23h
22h
21h
20h
19h
-35°
-40°
-45°
-50°
-55°
-60°

27

Magnitudes

brighter than 0.0 | 0.0–0.5 | 0.5–1.0 | 1.0–1.5 | 1.5–2.0 | 2.0–2.5 | 2.5–3.0 | 3.0–3.5 | 3.5–4.0 | 4.0–4.5 | 4.5–5.0 | 5.0–5.5 | 5.5–6.0 | 6.0–6.5 | 6.5–7.0 | 7.0–7.5 | fainter

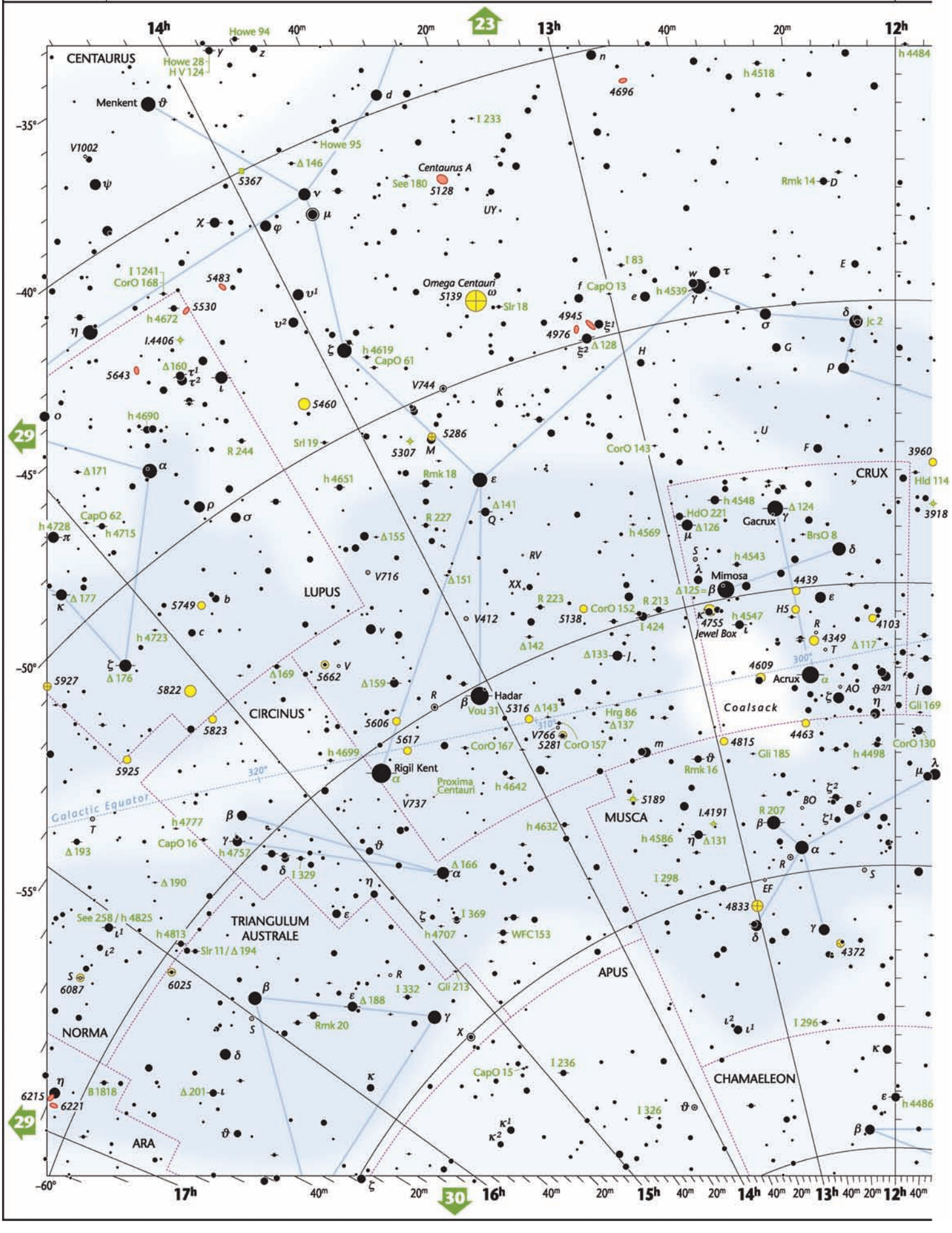


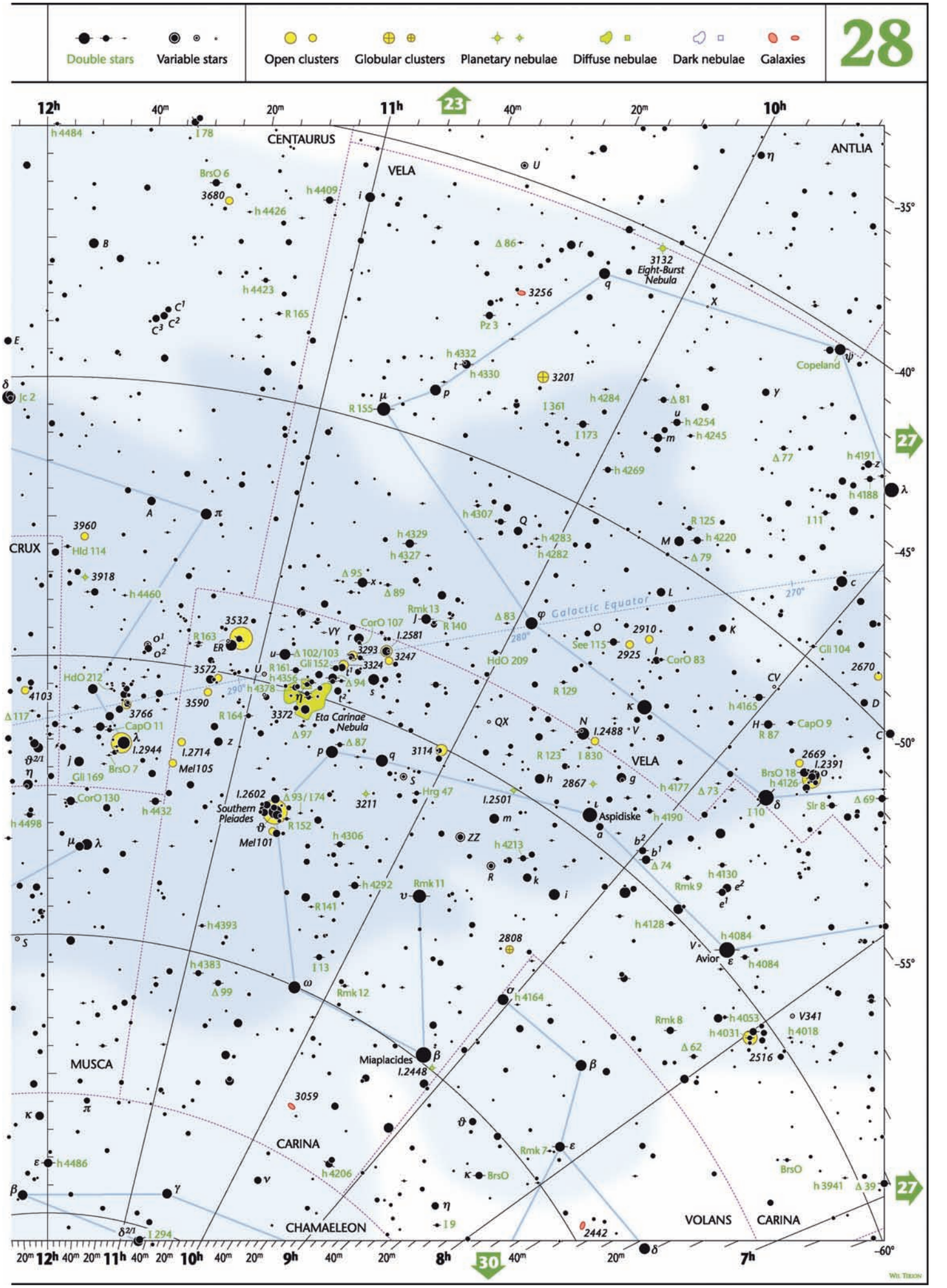

Double stars
Variable stars
Open clusters
Globular clusters
Planetary nebulae
Diffuse nebulae
Dark nebulae
Galaxies
27
6h
40m
20m
5h
40m
20m
4h
21
COLUMBA
CAELUM
HOROLOGIUM
FORNAX
ERIDANUS
PUP
CAR
DORADO
PICTOR
RETICULUM
HYDRUS
MENSA
TUCANA
Large Magellanic Cloud
2070 Tarantula Nebula
I 276
Achernar
-35°
-40°
-45°
-50°
-55°
-60°
26
30
3h
2h
1h
WIL TIRION

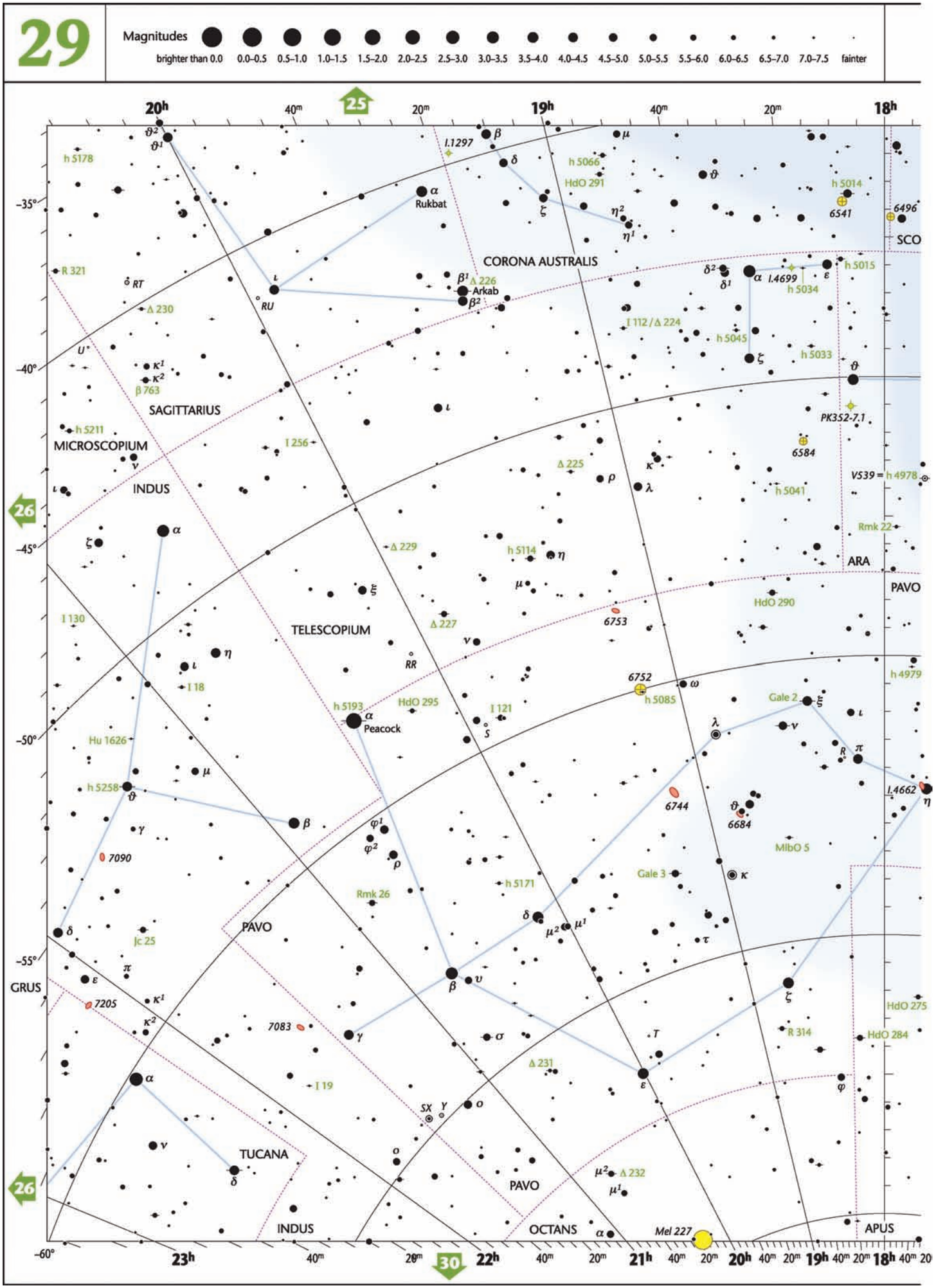
28

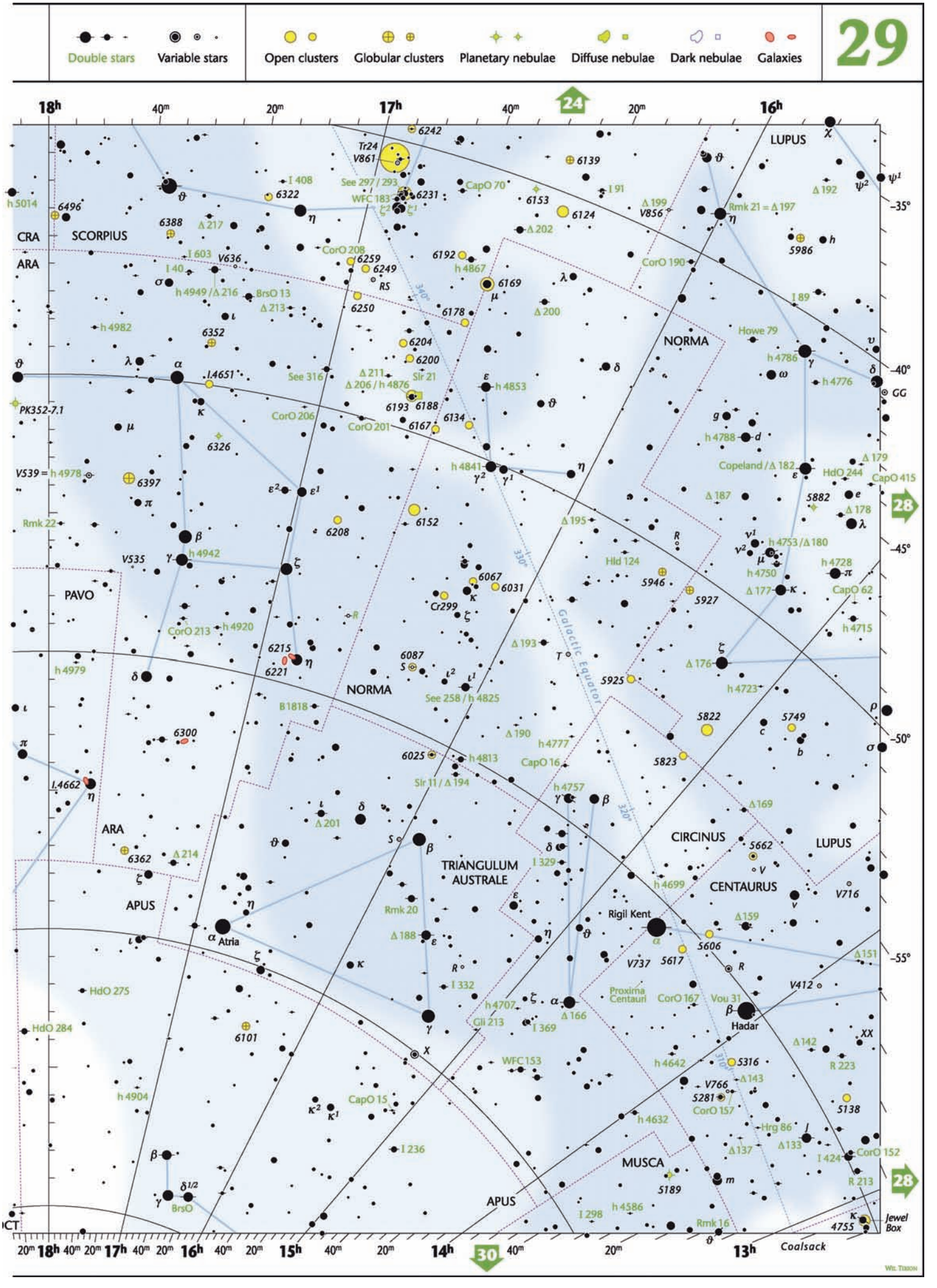
Magnitudes

brighter than 0.0 | 0.0–0.5 | 0.5–1.0 | 1.0–1.5 | 1.5–2.0 | 2.0–2.5 | 2.5–3.0 | 3.0–3.5 | 3.5–4.0 | 4.0–4.5 | 4.5–5.0 | 5.0–5.5 | 5.5–6.0 | 6.0–6.5 | 6.5–7.0 | 7.0–7.5 | fainter



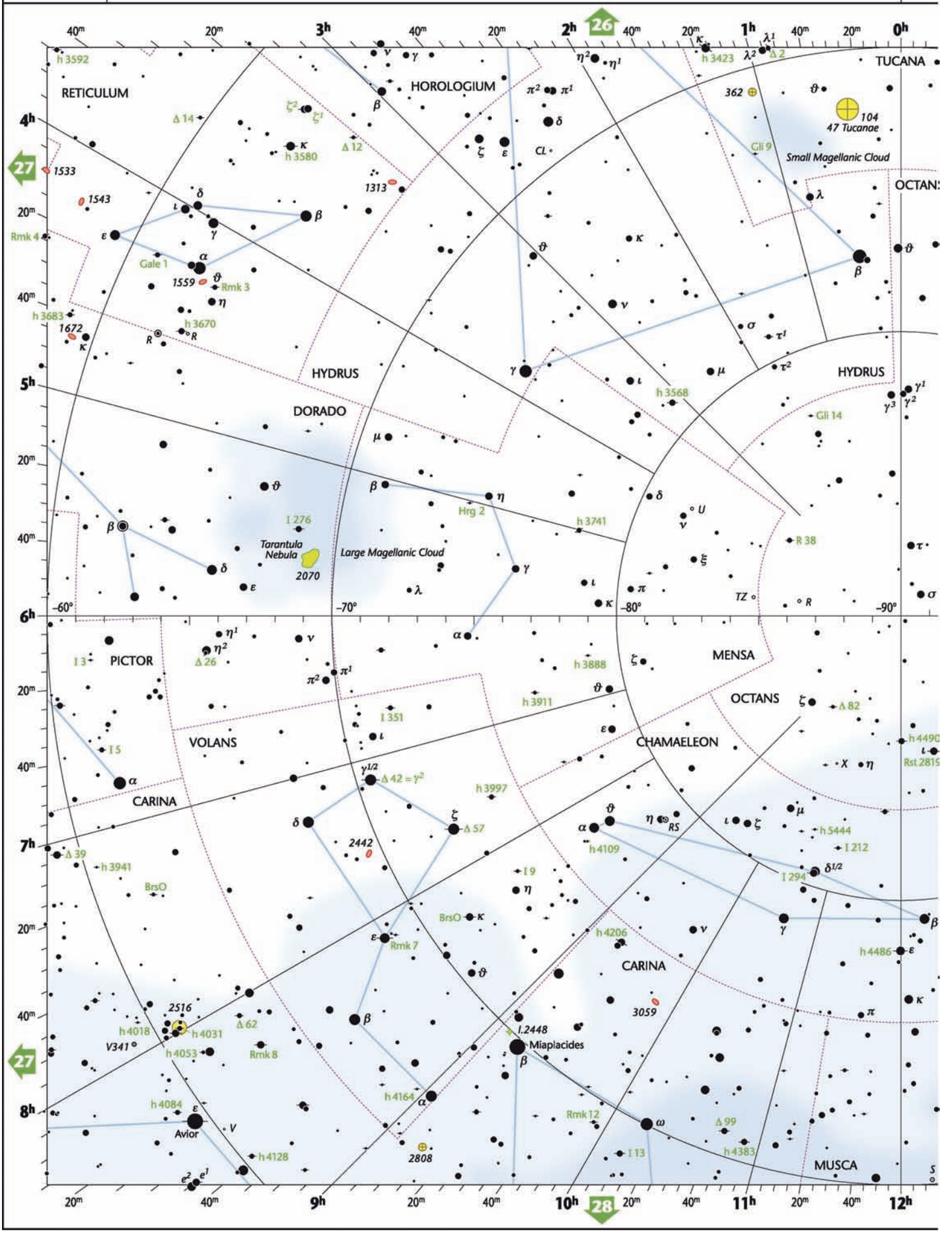

Double stars
Variable stars
Open clusters
Globular clusters
Planetary nebulae
Diffuse nebulae
Dark nebulae
Galaxies
CENTAURUS
VELA
ANTLIA
CRUX
MUSCA
CARINA
CHAMAELEON
VOLANS
Eta Carinae Nebula
Southern Pleiades
Mel105
Mel101
Miaplacides
Aspidiske
Avior
Copeland
3132 Eight-Burst Nebula
Galactic Equator
12h
11h
10h
9h
8h
7h
-35°
-40°
-45°
-50°
-55°
-60°

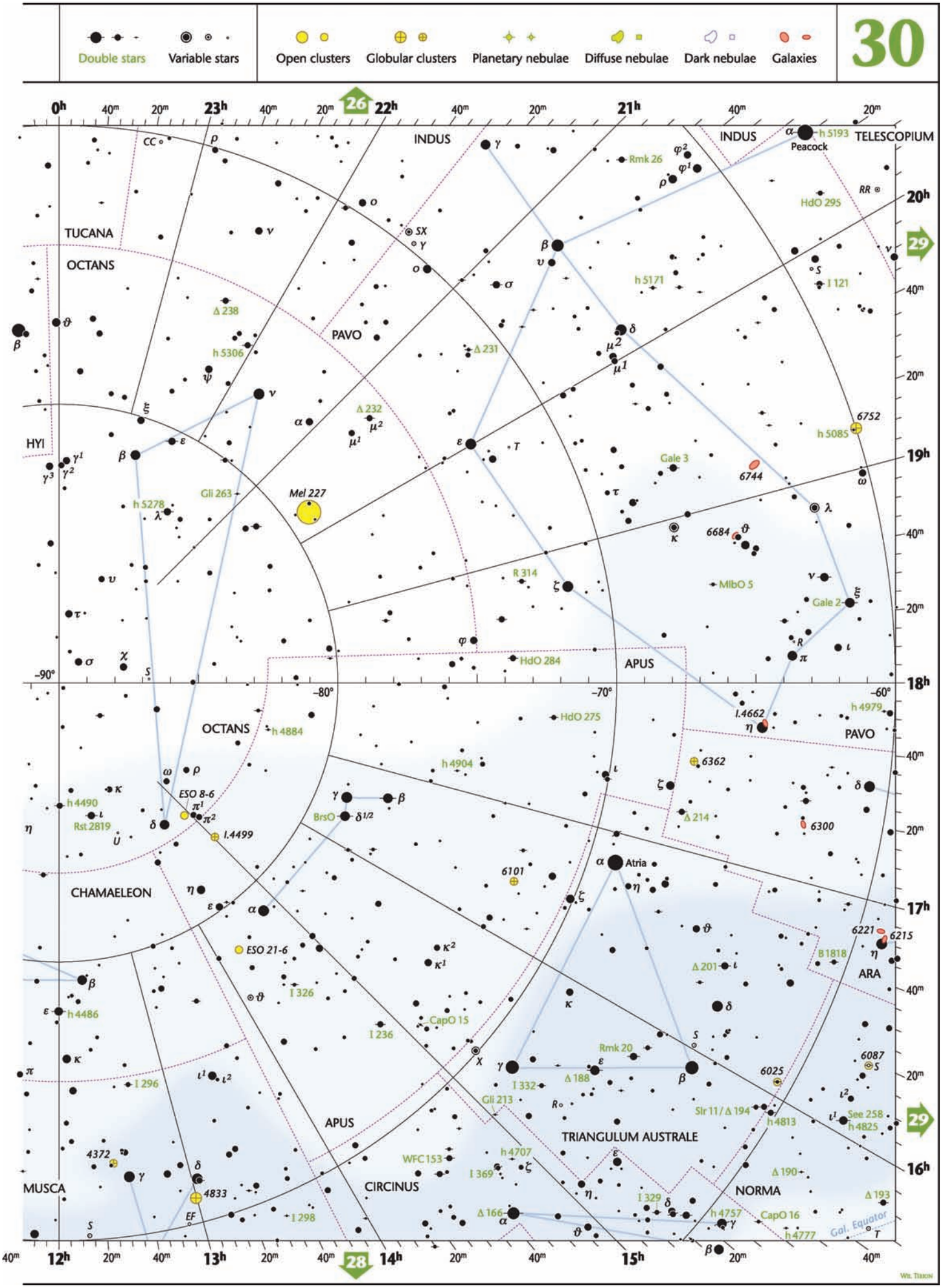

29
Magnitudes
brighter than 0.0
0.0–0.5
0.5–1.0
1.0–1.5
1.5–2.0
2.0–2.5
2.5–3.0
3.0–3.5
3.5–4.0
4.0–4.5
4.5–5.0
5.0–5.5
5.5–6.0
6.0–6.5
6.5–7.0
7.0–7.5
fainter
20h
40m
20m
19h
40m
20m
18h
25
26
30
−35°
−40°
−45°
−50°
−55°
−60°
23h
40m
20m
22h
40m
20m
21h
40m
20m
20h
40m
20m
19h
40m
20m
18h
CORONA AUSTRALIS
SAGITTARIUS
MICROSCOPIUM
INDUS
TELESCOPIUM
PAVO
ARA
SCO
GRUS
TUCANA
OCTANS
APUS
Rukbat
Arkab
Peacock
Hu 1626
RU
RT
RR
R 321
Δ 230
β 763
I 256
I 130
I 18
Δ 229
Δ 227
I 121
I 112 / Δ 224
Δ 225
h 5178
h 5211
h 5193
h 5258
h 5066
HdO 291
h 5014
6541
6496
h 5015
I.4699
h 5034
h 5045
h 5033
PK352-7.1
6584
V539 = h 4978
h 5041
Rmk 22
h 5114
HdO 290
6753
6752
h 5085
h 4979
Gale 2
I.4662
6744
6684
MlbO 5
Gale 3
h 5171
Rmk 26
Jc 25
7090
7205
7083
I 19
Δ 231
R 314
HdO 275
HdO 284
Δ 232
Mel 227
HdO 295


29
Double stars
Variable stars
Open clusters
Globular clusters
Planetary nebulae
Diffuse nebulae
Dark nebulae
Galaxies
18h
17h
16h
15h
14h
13h
LUPUS
SCORPIUS
CRA
ARA
NORMA
PAVO
APUS
TRIANGULUM AUSTRALE
CIRCINUS
CENTAURUS
MUSCA
Galactic Equator
Rigil Kent
Atria
Hadar
Proxima Centauri
Jewel Box
Coalsack
Tr24
V861
CapO 70
WFC 183
See 297 / 293
See 316
See 258 / h 4825
CorO 208
CorO 206
CorO 201
CorO 213
CorO 190
CorO 167
CorO 157
CorO 152
CapO 415
CapO 62
CapO 16
Slr 21
Slr 11 / Δ 194
BrsO 13
BrsO
Howe 79
Copeland / Δ 182
HdO 244
HdO 275
HdO 284
Hld 124
Vou 31
Hrg 86
Rmk 21 = Δ 197
Rmk 22
Rmk 20
Rmk 16
WFC 153
Gli 213
CapO 15
B1818
PK352-7.1
V539 = h 4978
V535
V636
V856
V737
V766
V716
V412
RS
Cr299
I 408
I 40
I 603
I 91
I 89
I 332
I 329
I 369
I 236
I 424
I 298
h 5014
h 4982
h 4949 / Δ 216
h 4867
h 4853
h 4841
h 4786
h 4776
h 4788
h 4753 / Δ 180
h 4750
h 4728
h 4715
h 4723
h 4777
h 4757
h 4699
h 4642
h 4632
h 4586
h 4979
h 4942
h 4920
h 4904
h 4707
Δ 211
Δ 206 / h 4876
Δ 217
Δ 213
Δ 214
Δ 202
Δ 200
Δ 199
Δ 195
Δ 193
Δ 192
Δ 190
Δ 188
Δ 187
Δ 179
Δ 178
Δ 177
Δ 176
Δ 169
Δ 166
Δ 159
Δ 151
Δ 143
Δ 142
Δ 137
Δ 133
Δ 201
I.4651
I.4662
6496
6388
6322
6231
6242
6139
6153
6124
6192
6169
6178
6250
6259
6249
6352
6204
6200
6193
6188
6167
6134
6326
6397
6208
6152
6215
6221
6067
6031
6087
6025
6300
6362
6101
5986
5882
5946
5927
5925
5822
5823
5749
5662
5606
5617
5316
5281
5189
5138
4755
R 223
R 213
XX
-35°
-40°
-45°
-50°
-55°
24
28
30
340°
330°
320°

Magnitudes

brighter than 0.0 | 0.0–0.5 | 0.5–1.0 | 1.0–1.5 | 1.5–2.0 | 2.0–2.5 | 2.5–3.0 | 3.0–3.5 | 3.5–4.0 | 4.0–4.5 | 4.5–5.0 | 5.0–5.5 | 5.5–6.0 | 6.0–6.5 | 6.5–7.0 | 7.0–7.5 | fainter




Double stars
Variable stars
Open clusters
Globular clusters
Planetary nebulae
Diffuse nebulae
Dark nebulae
Galaxies
30
INDUS
TELESCOPIUM
Peacock
TUCANA
OCTANS
PAVO
HYI
APUS
CHAMAELEON
MUSCA
CIRCINUS
TRIANGULUM AUSTRALE
NORMA
ARA
Atria
Mel 227
Gli 263
Rmk 26
HdO 295
h 5193
h 5171
I 121
Δ 238
h 5306
Δ 231
Δ 232
6752
h 5085
Gale 3
6744
h 5278
6684
R 314
MlbO 5
Gale 2
HdO 284
HdO 275
h 4884
h 4904
h 4979
I.4662
6362
Δ 214
6300
h 4490
Rst 2819
ESO 8-6
I.4499
BrsO
6101
ESO 21-6
I 326
CapO 15
I 236
h 4486
I 296
4372
4833
EF
I 298
WFC153
h 4707
I 369
Rmk 20
I 332
Δ 188
Gli 213
6221
6215
B 1818
Δ 201
6025
6087
Slr 11 / Δ 194
h 4813
See 258
h 4825
Δ 190
Δ 193
I 329
Δ 166
h 4757
CapO 16
h 4777
Gal. Equator
0h
23h
22h
21h
20h
19h
18h
17h
16h
15h
14h
13h
12h
40m
20m
–90°
–80°
–70°
–60°
26
29
28
Wil Tirion

Appendix A: Constellation table

The following list gives the full names of the 88 officially recognized constellations, together with their genitive (possessive) cases, order of size in terms of number of square degrees, standard International Astronomical Union (IAU) three-letter abbreviations and *Atlas* map number/s on which they are shown.

Name	Genitive	Size	Abbrev.	Map number(s)
Andromeda	Andromedae	19	AND	6 2 7
Antlia	Antliae	62	ANT	23 22 28
Apus	Apodis	67	APS	30 29 28
Aquarius	Aquarii	10	AQR	19 12 20 25
Aquila	Aquilae	22	AQL	19 18 11
Ara	Arae	63	ARA	29 30 28
Aries	Arietis	39	ARI	7 6 13 12
Auriga	Aurigae	21	AUR	3 7 8
Bootes	Bootis	13	BOO	10 9 17 16 4 5
Caelum	Caeli	81	CAE	21 27
Camelopardalis	Camelopardalis	18	CAM	1 3 2 4
Cancer	Cancri	31	CNC	8 15
Canes Venatici	Canum Venaticorum	38	CVN	9 4 10
Canis Major	Canis Majoris	43	CMA	22 14 15
Canis Minor	Canis Minoris	71	CMI	15 14
Capricornus	Capricorni	40	CAP	19 25
Carina	Carinae	34	CAR	27 28 30
Cassiopeia	Cassiopeiae	25	CAS	2 3 1
Centaurus	Centauri	9	CEN	28 23 24 29
Cepheus	Cephei	27	CEP	2 1 5
Cetus	Ceti	4	CET	13 12 20 21
Chamaeleon	Chamaeleontis	79	CHA	30 28 27
Circinus	Circini	85	CIR	28 29 30
Columba	Columbae	54	COL	21 22 27
Coma Berenices	Comae Berenices	42	COM	9 16 17
Corona Australis	Coronae Australis	80	CRA	25 24 29
Corona Borealis	Coronae Borealis	73	CRB	10 5
Corvus	Corvi	70	CRV	23 16
Crater	Crateris	53	CRT	23 16
Crux	Crucis	88	CRU	28
Cygnus	Cygni	16	CYG	11 5 2 6
Delphinus	Delphini	69	DEL	19 11
Dorado	Doradus	7	DOR	27 30
Draco	Draconis	8	DRA	5 4 1

Name	Genitive	Size	Abbrev.	Map number(s)
Equuleus	Equulei	87	EQU	19 11
Eridanus	Eridani	6	ERI	21 13 14 26 27
Fornax	Fornacis	41	FOR	21 20 26
Gemini	Geminorum	30	GEM	8 14 15
Grus	Gruis	45	GRU	20 26 25
Hercules	Herculis	5	HER	10 11 5 18 17
Horologium	Horologii	58	HOR	27 26 21
Hydra	Hydrae	1	HYA	15 23 22 24 26
Hydrus	Hydri	61	HYI	26 30 27
Indus	Indi	49	IND	26 29 30
Lacerta	Lacertae	68	LAC	2 6 11
Leo	Leonis	12	LEO	9 16 15 8
Leo Minor	Leonis Minoris	64	LMI	9 8 4
Lepus	Leporis	51	LEP	21 14 22
Libra	Librae	29	LIB	24 17
Lupus	Lupi	46	LUP	24 29 28
Lynx	Lyncis	28	LYN	3 8 4
Lyra	Lyrae	52	LYR	11 5
Mensa	Mensae	75	MEN	30 27
Microscopium	Microscopii	66	MIC	25
Monoceros	Monocerotis	35	MON	14 15 8
Musca	Muscae	77	MUS	28 20
Norma	Normae	74	NOR	29 28 24
Octans	Octantis	50	OCT	30 26 29
Ophiuchus	Ophiuchi	11	OPH	18 24 17 10
Orion	Orionis	26	ORI	14 7 8 13
Pavo	Pavonis	44	PAV	30 29 26
Pegasus	Pegasi	7	PEG	6 19 12 11
Perseus	Persei	24	PER	7 3 2
Phoenix	Phoenicis	37	PHE	26 20 21
Pictor	Pictoris	59	PIC	27 30
Pisces	Piscium	14	PSC	12 6 13
Piscis Austrinus	Piscis Austrini	60	PSA	20 25
Puppis	Puppis	20	PUP	22 27 15 14
Pyxis	Pyxidis	65	PYX	22
Reticulum	Reticuli	82	RET	27 26 30
Sagitta	Sagittae	86	SGE	11 19 18
Sagittarius	Sagittarii	15	SGR	25 24 18 19 29
Scorpius	Scorpii	33	SCO	24 17 18 25 29
Sculptor	Sculptoris	36	SCL	20
Scutum	Scuti	84	SCT	18 25
Serpens	Serpentis	23	SER	17 18 10 24
Sextans	Sextantis	47	SEX	15 16
Taurus	Tauri	17	TAU	7 13 14

Name	Genitive	Size	Abbrev.	Map number(s)
Telescopium	Telescopii	57	TEL	29 25
Triangulum	Trianguli	78	TRI	7 6 2
Triangulum Australe	Trianguli Australis	83	TRA	30 29 28
Tucana	Tucanae	48	TUC	26 29 30
Ursa Major	Ursae Majoris	3	UMA	4 9 3 5 1
Ursa Minor	Ursae Minoris	56	UMI	1 4 5
Vela	Velorum	32	VEL	28 27 22 23
Virgo	Virginis	2	VIR	16 17 23 9 24
Volans	Volantis	76	VOL	30 27 28
Vulpecula	Vulpeculae	55	VUL	11

Appendix B: Table of Greek letters

Upper case symbol	Lower case symbol	Greek letter
A	α	Alpha
B	β	Beta
Γ	γ	Gamma
Δ	δ	Delta
E	ε	Epsilon
Z	ζ	Zeta
H	η	Eta
Θ	θ (ϑ on the maps)	Theta
I	ι	Iota
K	κ	Kappa
Λ	λ	Lambda
M	μ	Mu
N	ν	Nu
Ξ	ξ	Xi
O	ο	Omicron
Π	π	Pi
P	ρ	Rho
Σ	σ	Sigma
T	τ	Tau
Y	υ	Upsilon
Φ	ϕ (φ on the maps)	Phi
X	χ	Chi
Ψ	ψ	Psi
Ω	ω	Omega

Appendix C: *Cambridge Double Star Atlas* target list

Below is the original master working list used in plotting all of the double and multiple stars shown in this *Atlas*. Pairs having companions at or above the map visual magnitude limit of 7.5 and 180 arcseconds or more in separation were plotted as separate stars, the position angle (PA) in degrees being given where available as an aid in positioning them with respect to their primaries.

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
WZ CAS	O ΣΣ 254	00 01 +60 21	7.6–10, 8.7	58″
85 PEG	β 733	00 02 +27 05	5.8, 8.9, 8.6	0.7,″ 33″
CAS	Σ 3053	00 03 +66 06	6.0, 7.2	15″
CAS	Σ 3057	00 05 +58 32	6.7, 9.3	4″
AND	β 997	00 05 +45 14	6.5, 9.5	22″
AND	O Σ 514	00 05 +42 06	6.1, 8.7	5″
CAS	Σ 3062	00 06 +58 26	6.4, 7.3	1.6″
AND	O ΣΣ 256	00 08 +31 23	7.1, 7.3	110″
σ CEP	Σ 2	00 09 +79 43	6.7, 6.9	0.8″
κ-1 SCL	β 391	00 09 −27 59	6.1, 6.2	1.4″
34 PSC	Σ 5	00 10 +11 09	5.5, 9.4	8″
AND	O Σ 2	00 13 +26 59	6.7, 7.5	0.5″
CEP	O ΣΣ 1	00 14 +76 02	7.6, 7.9	76″
35 PSC	Σ 12	00 15 +08 49	6.1, 7.5	11″
PHE	Wg 2	00 15 −40 06	7.5, 9.7	14″
CEP	Σ 13	00 16 +76 57	7.0, 7.1	0.9″
AND	h 1947	00 16 +43 36	6.2, 10.2	9″
38 PSC	Σ 22	00 17 +08 53	7.1, 7.7	4″
AND	Σ 24	00 18 +26 08	7.6, 8.4	5″
CET	β 393	00 18 −21 08	7.1, 7.9	0.7″
SCL	h 1949	00 18 −27 57	8.6, 8.9	75″
26 AND	O Σ 5	00 19 +43 47	6.0, 9.7	6″
ι CET	h 1953	00 19 −08 49	3.5, 8.4	108″
AND	S 384	00 20 +38 14	7.2, 9.7	90″
CEP	O Σ 6	00 21 +67 00	7.5, 8.8	0.6″
AND	AC 1	00 21 +32 59	7.3, 8.3	1.8″
PSC	β 1093	00 21 +10 59	7.0, 7.9	0.7″
42 PSC	Σ 27	00 22 +13 29	6.4, 10.3	29″
CAS	O Σ 9	00 26 +56 47	6.8, 10.0, 9.8	2.0,″ 23″
CAS	Σ 30	00 27 +49 59	7.0, 8.9	14″
PSC	O Σ 10	00 28 +16 02	6.4, 10.2	120″
CET	h 1968	00 28 −16 25	7.3, 8.0	33″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
12 CET	h 322	00 30 −03 57	5.7, 10.5	10″
AND	h 5451	00 31 +33 35	6.0, 8.4	56″
CET	h 1981	00 31 −10 05	6.9, 8.5	79″
λ CAS	O Σ 12	00 32 +54 31	5.5, 5.8	0.6″
51 PSC	Σ 36	00 32 +06 57	5.7, 9.5	27″
β-1/2 TUC	Lac 119	00 32 −62 58	4.3, 4.5	27″
AND	β 1310	00 33 +23 12	7.0, 9.2	95″
SCL	h 3377	00 34 −26 06	7.5, 9.8	21″
SCL	h 3375	00 34 −35 00	6.6, 8.5	4″
CET	Σ 39	00 34 −04 33	7.1, 8.6	20″
AND	Σ 40	00 35 +36 50	6.7, 8.5	12″
π AND	H V 17 = h 1030	00 37 +33 43	4.3, 7.1	36″
CET	β 395	00 37 −24 46	6.3, 6.4	0.7″
PHE	LDS 21	00 37 −49 08	6.8, 8.6	330″
CAS	Σ 45	00 39 +46 57	6.9, 9.9	18″
CAS	O Σ 16	00 39 +49 21	5.7, 10.2	13″
SCL	h 1991	00 39 −25 06	6.6, 9.7	47″
SCL	h 1992	00 39 −25 36	7.8, 8.4	45″
CAS	O ΣΣ 5	00 40 +76 52	7.0, 8.7	116″
α CAS	H V 18 = h 1993	00 40 +56 32	2.4, 9.0	70″
AND	Σ 47	00 40 +24 03	7.3, 8.8	17″
55 PSC	Σ 46	00 40 +21 26	5.6, 8.5	7″
CET	β 109	00 40 −16 31	6.6, 9.1	105″
CET	h 1995	00 43 −09 55	6.6, 9.6	39″
λ-1 SCL	HdO 182	00 43 −38 28	6.6, 7.0	0.7″
PHE	h 3390	00 43 −45 11	7.1, 10.3	14″
TUC	CorO 3	00 44 −62 30	6.3, 8.0	2.3″
21 = YZ CAS	H N 122	00 46 +74 59	5.7–6.1, 10.6	36″
AND	Σ I 1	00 46 +30 57	7.3, 7.4	47″
CAS	Σ 59	00 48 +51 27	7.2, 8.1	2.3″
CAS	H V 82	00 48 +51 06	8.0, 8.3	52″
η CAS	Σ 60	00 49 +57 49	3.5, 7.4	13″
PSC	O ΣΣ 9	00 50 +30 27	7.6, 9.2	100″
65 PSC	Σ 61	00 50 +27 43	6.3, 6.3	4″
PHE	I 47	00 52 −43 43	7.2, 7.6	1.0″
λ-1 TUC	Δ 2	00 52 −69 30	6.7, 7.3	20″
CAS	β 497	00 53 +61 07	4.8, 9.3	130″
CET	β 734	00 53 −24 00	5.6, 9.6	11″
CET	WNO 1	00 53 −24 47	6.6, 9.2	5″
CAS	Σ 70	00 54 +52 41	6.3, 9.3, 9.8	8,″ 78″
36 AND	Σ 73	00 55 +23 38	6.1, 6.5	1.0″
66 PSC	O Σ 20	00 55 +19 11	6.1, 7.2	0.5″
CAS	Es 940	00 57 +52 14	7.5, 9.5	63″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
TUC	I 48	00 58 −66 34	7.6, 8.6	0.5″
AND	Σ 79	01 00 +44 43	6.0, 6.8	8″
AND	O Σ 21	01 03 +47 23	6.8, 8.1	1.2″
TUC	h 3416	01 03 −60 06	7.6, 7.7	5″
26 CET	Σ 84	01 04 +01 22	6.1, 9.5	16″
PHE	h 3415	01 04 −40 39	7.6, 8.5	1.0″
76 PSC	S 393	01 06 +32 11	6.7, 9.6	57″
ψ-1 PSC	Σ 88	01 06 +21 28	5.3, 5.5	30″
77 PSC	Σ 90	01 06 +04 55	6.4, 7.3	33″
β PHE	Slr 1	01 06 −46 43	4.1, 4.2	0.6″
CAS	H IV 66	01 07 +53 30	6.5, 10.1	22″
PSC	O Σ 22	01 07 +11 33	7.2, 10.2	9″
CET	Σ 91	01 07 −01 44	7.4, 8.6	5″
AND	β 397	01 08 +46 50	7.5, 10.1	9″
ζ PHE	Rst 1205/Rmk 2	01 08 −55 15	4.0, 6.9/8.2	0.8″/7″
PHE	Slr 2	01 09 −46 40	7.3, 8.3	1.2″
φ AND	O Σ 515	01 10 +47 15	4.6, 5.6	0.5″
β AND	Barnard 1	01 10 +35 37	2.1, 11.8	80″ In field with SG NGC 404
PSC	β 303	01 10 +23 48	7.3, 7.6	0.7″
TUC	Gli 9	01 10 −72 57	7.2, 10.2	3″
θ CAS	β pm	01 11 +55 09	4.3, 10.2	140″
CAS	β 235/O ΣΣ 12	01 11 +51 01	6.9, 10.4/9.0	43″/59″
PSC	Σ 98	01 13 +32 05	7.0, 8.1	20″
PSC	O Σ 26	01 13 +30 04	6.3, 10.5	11″
φ PSC	Σ 99	01 14 +24 35	4.7, 9.1	8″
ζ PSC	Σ 100	01 14 +07 35	5.2, 6.2	23″
37 CET	Σ I 3	01 14 −07 55	5.2, 7.8	48″
κ TUC	h 3423	01 16 −68 53	5.0, 7.0, 7.9	5,″ 320″
CAS	h 2028	01 17 +74 02	7.1, 7.9	61″
SCL	I 50	01 17 −37 16	7.7, 9.7	71″
TUC	h 3426	01 17 −66 24	6.4, 8.3	2.4″
AND	Σ 102	01 18 +49 01	7.2, 8.4, 8.8, 10.6	0.5,″ 10,″ 27″
AND	h 1077	01 18 +44 38	7.4, 9.4	41″
CEP	O Σ 28/O ΣΣ 14	01 19 +80 52	7.2, 8.7/7.8	0.8″/130″
AND	Σ 108	01 19 +37 23	6.5, 9.6	6″
φ CAS	H III 23	01 20 +58 14	5.1, 7.0	135″ In OC NGC 457
42 CET	Σ 113	01 20 −00 31	6.5, 7.0	1.6″
CET	h 2036	01 20 −15 49	7.4, 7.6	2.2″
PHE	h 3430	01 20 −57 20	7.2, 9.5	3″
35 CAS	S 397	01 21 +64 40	6.3, 8.6	57″
CET	h 2043	01 22 −19 05	6.5, 8.6	5″
CAS	Σ 115	01 23 +58 09	7.1, 7.3	0.7″
CAS	Σ 114	01 24 +72 51	7.3, 10.5	4″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
CET	Se 1	01 24 −24 21	6.9, 8.9	2.7″
HYI	h 3435	01 25 −59 30	7.1, 9.2	25″
ψ CAS	Sh 18/β 1101/Σ 117	01 26 +68 08	4.7, 9.2/10.0/10.0	22″/22″/2.6″
PSC	Σ 122	01 27 +03 32	6.7, 9.5	6″
SCL	h 3436	01 27 −30 14	6.9, 9.6	10″
ω AND	β 999/β 82	01 28 +45 24	5.0, 10.4/10.4	93″/5″
PSC	S 398	01 28 +07 58	6.3, 8.0	69″
CET	β 399	01 28 −10 54	6.1, 9.8	1.6″
CET	h 3437	01 28 −17 16	7.4, 9.4	12″
PSC	Σ 132	01 32 +16 57	6.9, 9.9	45″
CAS	Σ 131	01 33 +60 41	7.3, 9.9	14″ In OC M103
AND	Σ 133	01 33 +35 51	6.8, 10.3, 10.6, 10.6	3,″ 24,″ 23″
CET	h 2052 = h 3373	01 32 −19 01	6.9, 7.5	80″
100 PSC	Σ 136	01 35 +12 34	7.3, 8.3	16″
PSC	Σ 138	01 36 +07 39	7.5, 7.6	1.7″
CET	h 2061	01 36 −17 32	7.2, 9.4	70″
τ SCL	h 3447	01 36 −29 54	6.0, 7.4	0.8″
CAS	O Σ 33	01 37 +58 38	7.3, 9.0	27″
OCT	Gli 14	01 37 −82 17	7.6, 8.4	5″
103 PSC	β 5	01 39 +16 38	7.1, 9.1	1.0″
ERI	Δ 4	01 39 −53 26	7.2, 8.5	10″
SCL	h 3452	01 40 −37 28	7.4, 8.9	20″
p ERI	Δ 5	01 40 −56 12	5.8, 5.9	11″
CAS	h 1088	01 42 +58 38	6.3, 9.8	20″
44 CAS	β 1103	01 43 +60 33	5.8, 9.6, 9.2	66,″ 140″
CET	Σ 147	01 42 −11 19	6.1, 7.4	2.0″
CAS	β 870	01 44 +57 32	6.4, 7.8	1.0″
CAS	O Σ 35	01 44 +55 53	7.2, 10.4	13″
CET	β 6	01 45 −06 46	6.6, 9.4	2.6″
ε SCL	h 3461	01 46 −25 03	5.4, 8.5	5″
CAS	β pm	01 48 +63 51	5.7, 8.8	90″
PER	Σ 162	01 49 +47 54	6.5, 7.2, 8.4	1.9,″ 20″
PSC	h 644	01 49 +07 41	7.3, 9.3	127″
1 ARI	Σ 174	01 50 +22 17	6.3, 7.2	3″
χ CET	β pm	01 50 −10 41	4.9, 6.9	184″ P.A. = 250
CAS	Σ 163	01 51 +64 51	6.8, 9.1	34″
ζ CET	β pm	01 52 −10 20	3.8, 10.1	189″
AND	Σ 179	01 53 +37 19	7.6, 8.1	4″
γ ARI	Σ 180	01 54 +19 18	4.5, 4.6	8″ Mesarthim
CAS	Σ 170	01 55 +76 13	7.5, 8.2	3″
HYI	h 3475	01 55 −60 19	7.2, 7.2	2.5″
56 AND	Σ I 4	01 56 +37 15	5.8, 6.1	200″ P.A. = 300 At edge OC NGC 752

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
CET	Σ 186	01 56 +01 51	6.8, 6.8	1.0″
λ ARI	H V 12 = O ΣΣ 21	01 58 +23 36	4.8, 6.7	37″
TRI	β pm	01 59 +33 13	7.2, 9.4	125″
ARI	Σ 194	01 59 +24 51	7.6, 9.5	1.2″
AA CET	H II 58	01 59 −22 55	7.3, 7.6	8″
CAS	Σ 185	02 02 +75 30	6.7, 8.2	1.3″
48 CAS	β 513	02 02 +70 54	4.7, 6.4	0.9″
CAS	h 1000	02 00 +64 37	5.3, 9.6	42″
CET	h 3476	02 00 −08 31	5.5, 9.6	62″
α PSC	Σ 202	02 02 −02 46	4.1, 5.2	1.9″ Alrescha
CAS	Σ 191	02 03 +73 51	6.2, 9.1	5″
γ AND	Σ 205/O Σ 38	02 04 +42 20	2.3, 5.0/6.3	10″/0.4″ Almaak/ Almach
10 ARI	Σ 208	02 04 +25 56	5.8, 7.9	1.2″
61 CET	H V 102	02 04 −00 20	5.9, 10.4	43″
14 ARI	H VI 69	02 09 +25 56	5.0, 8.0, 8.0	93,″ 107″
CEP	O Σ 37	02 10 +81 29	6.9, 9.1	1.2″
59 AND	Σ 222	02 11 +39 02	6.1, 6.7	16″
6 TRI	Σ 227	02 12 +30 18	5.3, 6.7	4″ Often listed as ι TRI
CEP	S 405	02 13 +79 42	6.5, 7.1	56″
PER	O ΣΣ 24	02 13 +57 12	7.0, 8.9	68″
PER	β pm	02 13 +51 06	5.4, 9.8	27″
66 CET	Σ 231	02 13 −02 24	5.7, 7.7	16″
AND	Σ 228	02 14 +47 29	6.6, 7.2	0.9″
CET	H VI 110	02 14 −03 02	7.3, 10.1	82″
CAS	β pm = Edg 10	02 16 +67 40	7.3, 9.4	20″
CET	Σ 242	02 16 −09 49	7.3, 9.8	60″
φ ERI	Δ 6	02 16 −51 31	3.6, 8.8	87″
PER	O ΣΣ 25	02 17 +57 03	6.5, 7.4	103″
TRI	Σ 239	02 17 +28 45	7.1, 7.8	14″
AND	Σ 245	02 19 +40 17	7.3, 8.0	11″
ο CET	H VI 1	02 19 −02 59	3.5–9.1, 9.3	119″ Mira
CAS	O ΣΣ 26	02 20 +60 02	7.0, 7.3	63″
AND	Σ 249	02 22 +44 36	7.2, 9.0	2.4″
AND	β pm = σ 70	02 23 +41 24	5.8, 10.9, 7.4	56,″ 303″ P.A. = 9
FOR	β 738	02 23 −29 52	7.6, 8.0	1.6″
CET	H III 80	02 26 −15 20	5.9, 9.1, 10.8	12,″ 106″
ARI	O ΣΣ 27	02 27 +10 34	6.7, 8.3	73″
ι CAS	Σ 262	02 29 +67 24	4.6, 6.9, 9.0	3,″ 7″
PER	Σ 268	02 29 +55 32	6.7, 8.5	3″
ARI	Σ 271	02 30 +25 14	5.9, 10.4	12″
PER	Σ 270	02 31 +55 33	7.0, 9.7, 10.6	21,″ 38″
α UMI	Σ 93	02 32 +89 16	1.9–2.1, 9.1	19″ Polaris

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
CET	Σ 274	02 32 +01 06	7.5, 7.6	14″
ω FOR	h 3506	02 34 −28 14	5.0, 7.7	11″
15 TRI	AG (no #)	02 36 +34 41	5.6, 6.8	142″
ν CET	Σ 281	02 36 +05 36	5.0, 9.1	8″
CET	h 3511	02 36 −21 24	7.2, 8.7	15″
30 ARI	Σ I 5	02 37 +24 39	6.5, 7.0	39″
CAS	O ΣΣ 28	02 39 +62 36	6.7, 7.4	68″
TRI	Σ 285	02 39 +33 25	7.5, 8.1	1.8″
ARI	Σ 287	02 39 +14 52	7.4, 9.7	7″
HOR	CorO 14	02 39 −52 57	7.4, 8.3	9″
HOR	h 3520	02 39 −54 50	7.5, 8.6	21″
HOR	Δ 7	02 40 −59 34	7.2, 7.5	37″
33 ARI	Σ 289	02 41 +27 04	5.3, 9.6	27″
ARI	Σ 291	02 41 +18 48	7.7, 7.5, 9.5	3,″ 66″
84 CET	Σ 295	02 41 −00 42	5.8, 9.7	4″
γ CET	Σ 299	02 43 +03 14	3.6, 6.2	2.3″
CET	h 3524	02 43 −20 17	7.5, 9.3	19″
ERI	h 3527	02 43 −40 32	7.0, 7.2	2.1″
θ PER	Σ 296	02 44 +49 14	4.1, 10.0, 9.5	20,″ 77″
PER	h 654	02 44 +35 07	7.3, 9.9	32″
FOR	BrsO 1	02 44 −25 30	7.0, 8.5	12″
PER	β 9	02 47 +35 33	6.4, 8.5	1.7″
ARI	Σ 305	02 48 +19 22	7.5, 8.3	4″
π ARI	Σ 311	02 49 +17 28	5.3, 8.0, 10.7	4,″ 25″
FOR	h 3532	02 49 −37 24	7.0, 8.1	5″
ARI	O Σ 46	02 50 +30 32	6.8, 10.0	5″
41 ARI	H VI 5	02 50 +27 16	3.6, 8.8	122″
γ-1 FOR	h 2161	02 50 −24 34	6.1, 10.5	40″
η-2 FOR	h 3536	02 50 −35 51	6.0, 10.0	5″
CAS	Σ 306	02 51 +60 25	7.3, 9.2	2.0″
η PER	Σ 307	02 51 +55 54	3.8, 8.5, 9.8	28,″ 67″
16 PER	β pm	02 51 +38 19	4.3, 10.4	234″
PER	Σ 314	02 53 +53 00	7.0, 7.3	1.5″
τ PER	Edgecomb (no #)	02 54 +52 46	4.0, 10.5	52″
20 PER	Σ 318	02 54 +38 20	5.0, 9.7	14″
CAS	β pm	02 56 +64 20	6.2, 9.6	116″
ARI	Σ 326	02 56 +26 52	7.6, 9.8	6″
CET	Σ 330	02 57 −00 34	7.2, 9.1	9″
θ ERI	Pz 2	02 58 −40 18	3.2, 4.1	8″ Acamar
ε ARI	Σ 333	02 59 +21 20	5.2, 5.6	1.4″
CET	Σ 334	02 59 +06 39	7.9, 8.4	1.2″
CAS	O ΣΣ 31	03 01 +59 40	7.4, 8.8	74″
PER	Σ 331	03 01 +52 21	5.2, 6.2	12″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
PER	Σ 336	03 02 +32 25	7.0, 8.3	8″
α + 93 CET	–	03 02 +04 05	2.5, 5.6	960″
ERI	Σ 341	03 03 −02 05	7.7, 9.7	9″
ρ-2 ERI	β 11	03 03 −07 41	5.4, 8.9	1.5″
γ PER	h 2170	03 05 +53 30	2.9, 10.5	57″
52 ARI	Σ 346	03 05 +25 15	6.9, 6.9, 10.8, 10.8	0.5,″ 5,″ 102″
HOR	Δ 10	03 05 −51 19	7.5, 8.8	38″
CEP	Σ 320	03 06 +79 25	5.7, 9.1	5″
CAS	h 2166	03 08 +75 48	7.6, 9.4, 9.5, 9.7	59,″ 60,″ 64″
β PER	β 526	03 08 +40 57	2.1, 10.5	82″ Algol
HYI	h 3568	03 08 −78 59	5.7, 7.7	15″
PER	Σ 352	03 09 +35 28	7.7, 9.8	4″
ERI	β pm	03 11 −11 08	7.2, 8.8	144″
α FOR	h 3555	03 12 −28 59	4.0, 7.2	5″
ERI	Jc 8/h3556	03 12 −44 25	6.4, 7.4/8.8	0.7″/4″
ARI	Σ 366	03 14 +22 57	6.9, 9.6	47″
RET	Δ 12	03 15 −64 27	6.7, 9.0	19″
ERI	β 84	03 16 −05 55	6.9, 7.1	1.0″
PER	Σ 369	03 17 +40 29	6.8, 7.7	3″
CAM	O Σ 52	03 18 +65 40	6.8, 7.3	0.5″
95 CET	AC 2	03 18 −00 56	5.6, 8.0	1.2″
ζ RET	–	03 18 −62 30	5.3, 5.6	309″ P.A. = 217
ERI	h 3565	03 19 −18 34	5.9, 8.2	8″
τ-4 ERI	Jc 1	03 20 −21 45	4.0, 9.5	6″
FOR	LDS 93	03 20 −28 51	7.4, 8.4	255″
PER	Webb (no #)	03 22 +49 04	6.2, 9.7	206″
ARI	Σ 381	03 23 +20 58	7.5, 8.3	1.0″
PER	Σ 382	03 24 +33 32	5.8, 9.3	5″
HOR	h 3576	03 25 −45 40	7.3, 8.8	2.9″
HOR	h 3575	03 25 −51 04	6.7, 10.2	36″
ARI	Σ 394	03 28 +20 28	7.1, 8.1	7″
χ-3 FOR	I 58	03 28 −35 51	6.5, 10.5	6″
CAM	Σ 385	03 29 +59 56	4.2, 7.8	2.5″
PER	Σ 391	03 29 +45 03	7.6, 8.3	3″
PER	AG 67	03 29 +40 11	7.5, 10.0	24″
κ RET	h 3580	03 29 −62 56	4.7, 10.3	54″
CAM	Σ 389	03 30 +59 22	6.4, 7.9	2.6″
CAM	Σ 390	03 30 +55 27	5.1, 10.0	15″
PER	Σ 392	03 30 +52 54	7.4, 9.6	28″
TAU	Σ I 7	03 31 +27 44	7.4, 7.8	43″
TAU	Σ 401	03 31 +27 34	6.6, 6.9	11″
CAM	O Σ 54	03 32 +67 35	7.5, 9.7	24″
PER	O Σ 56	03 32 +47 52	6.8, 10.3	29″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
TAU	AG 68 = H IV 44	03 32 +11 33	6.9, 10.1	18″
ERI	S 411	03 32 −07 05	7.4, 9.2	19″
CAM	Σ 396	03 34 +58 46	6.4, 7.7	20″
PER	β 787	03 34 +48 37	7.4, 10.3	35″
7 TAU	Σ 412	03 34 +24 28	6.6, 6.9, 9.9	0.7,″ 22″
CAM	Σ 400	03 35 +60 02	6.8, 8.0	1.4″
PER	β pm	03 36 +42 53	7.4, 8.4	94″
PER	β 533	03 36 +31 41	7.6, 7.7	1.1″
TAU	Σ 422	03 37 +00 35	6.0, 6.7	7″ 10 TAU in field
PER	S 430	03 38 +44 48	7.2, 7.5	40″
RET	Δ 14	03 38 −59 47	7.0, 8.3	57″
CAM	O ΣΣ 36	03 40 +63 52	6.9, 8.3	46″
PER	Σ 425	03 40 +34 07	7.5, 7.6	2.0″
TAU	Σ 430	03 40 +05 08	6.7, 9.6, 10.5	26,″ 35″
ERI	Δ 15	03 40 −40 22	6.9, 7.7	8″
TAU	Σ 427	03 41 +28 46	7.4, 7.8	7″
ERI	Σ 436	03 41 −12 37	7.5, 9.1	40″
40 PER	Σ 431	03 42 +33 58	5.0, 10.0	26″
OCT	R 38	03 42 −85 16	6.6, 8.1	1.9″
CAM	Webb 2 = Pz 97	03 43 +59 58	5.9, 8.5	55″
δ PER	β pm	03 43 +47 47	3.0, 10.3	99″
TAU	Σ 435	03 43 +25 41	7.2, 8.9	13″
ο PER	β 535	03 44 +32 17	3.8, 8.3	1.0″
ERI	h 3589	03 44 −40 40	6.7, 9.3	5″
TAU	O ΣΣ 38	03 45 +27 54	6.8, 6.9	134″
19 TAU	h 3251	03 45 +24 28	4.3, 8.1	72″
RET	h 3592	03 45 −54 16	6.5, 9.3	5″
TAU	Σ 444	03 46 +23 09	6.9, 10.1	4″
TAU	Σ 450	03 47 +23 55	7.1, 9.1	6″
PER	Σ 448	03 48 +33 36	6.7, 9.2	3″
η TAU	Σ I 8	03 48 +24 06	2.9, 8.0, 8.0, 8.6	117″, 180″, 190″ Alcyone/in M45
TAU	S 437	–	7.6, 8.1	40″ In center of Pleiades (M45) Cluster
30 TAU	Σ 452	03 48 +11 09	5.1, 9.8	9″
CAM	S 436	03 49 +57 07	6.5, 7.3	58″
TAU	O ΣΣ 40	03 49 +24 23	6.6, 7.5	86″
f ERI	Δ 16	03 49 −37 37	4.7, 5.3	8″
γ CAM	h 2200	03 50 +71 20	4.6, 8.5	106″
PER	Σ 446	03 50 +52 39	6.9, 9.9	9″ In OC NGC 1444
PER	Es 277	03 50 +34 49	6.8, 9.8	22″
TAU	O Σ 65	03 50 +25 35	5.8, 6.2	0.6″
TAU	O Σ 64	03 50 +23 51	6.9, 10.2, 10.5	3,″ 10″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
CAM	h 1139	03 52 +70 30	7.5, 9.6	47″
31 TAU	Kui 15	03 52 +06 32	6.3, 6.6	0.7″
30 ERI	h 338	03 53 −05 22	5.5, 10.4	8″
ζ PER	Σ 464	03 54 +31 53	2.9, 9.5, 9.5, 10.2	13,″ 94,″ 120″
32 ERI	Σ 470	03 54 −02 57	4.8, 5.9	7″
CAM	O Σ 67	03 57 +61 07	5.3, 8.5	1.9″
43 PER	S 440	03 57 +50 42	5.3, 10.1	75″
PER	Σ 469	03 57 +41 53	6.8, 10.3	9″
ε PER	Σ 471	03 58 +40 01	2.9, 8.9	9″
PER	O Σ 69	04 00 +38 49	6.5, 9.2	1.5″
TAU	Σ 479 = H N 93	04 01 +23 12	6.9, 7.8, 9.5	7,″ 58″
TAU	Σ 481	04 02 +28 08	7.5, 10.1	15″
ERI	β 1004	04 02 −34 29	7.3, 7.9	1.2″
PER	Σ 483	04 04 +39 31	7.4, 9.4	1.3″
37 TAU	β pm	04 05 +22 05	4.4, 9.4	137″
AG PER	O Σ 71	04 07 +33 27	6.9, 8.9	0.8″
CAM	Σ 485	04 08 +62 20	6.9, 6.9	18″ In OC NGC 1502
PER	AG 308	04 08 +43 11	6.6, 7.2	130″
PER	O Σ 531	04 08 +38 04	7.3, 9.7	2.3″
TAU	O Σ 72	04 08 +17 20	6.1, 9.7	5″
TAU	Σ 495	04 08 +15 10	6.1, 8.8	4″
TAU	Σ 494	04 09 +23 06	7.5, 7.7	5″
CEP	Σ 460	04 10 +80 42	5.6, 6.3	0.8″
TAU	Σ 510	04 12 +00 44	6.7, 10.1	11″
ERI	h 2224	04 12 −08 50	6.8, 8.8	52″
ERI	h 3628	04 12 −36 09	7.1, 8.0	50″
47 TAU	β 547	04 14 +09 16	5.1, 7.3	1.3″
39 ERI	Σ 516	04 14 −10 15	5.0, 8.5	6″
o-2 ERI	Σ 518	04 15 −07 39	4.4, 9.7, 11.2	83,″ 9″
TAU	H VI 98	04 16 +06 11	6.4, 7.0, 10.0	64,″ 214″
TAU	Σ 517	04 16 +00 27	7.4, 9.3	3″
RET	Gale 1	04 16 −60 57	6.9, 7.4	0.7″
PER	O ΣΣ 44	04 17 +46 13	7.2, 8.6	58″
θ RET	Rmk 3	04 18 −63 15	6.0, 7.7	4″
55 TAU	O Σ 79	04 19 +16 32	7.2, 8.2	0.7″
ERI	h 3642	04 19 −33 54	6.5, 8.7	6″
HOR	h 3643	04 19 −44 16	5.5, 8.6	70″
DOR	φ 87	04 19 −52 52	6.1, 9.1	0.6″
φ TAU	Sh 40 = O ΣΣ 48	04 20 +27 21	5.1, 7.5	49″
PER	S 445	04 21 +50 15	7.3, 8.2	71″ In OC NGC 1545
PER	Σ 521	04 22 +50 02	7.5, 9.6	2.1″
TAU	β 87	04 22 +20 49	6.2, 8.6	1.9″
ERI	β 744/h 3644	04 22 −25 44	6.2, 6.7/8.2	0.6″/45″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
CAM	Arg 100	04 23 +59 37	6.2, 9.3	32″
χ TAU	Σ 528	04 23 +25 38	5.4, 8.5	19″
TAU	O Σ 82	04 23 +15 03	7.3, 8.6	1.2″
TAU	Σ 535	04 23 +11 23	7.0, 8.3	1.1″
PER	O Σ 80	04 24 +42 26	6.5, 7.0	0.5″
PER	Σ 533	04 24 +34 19	7.3, 8.5	19″
62 TAU	Σ 534	04 24 +24 18	6.4, 7.9	29″
DOR	Rmk 4	04 24 −57 04	6.9, 7.2	6″
ERI	I 59	04 25 −34 45	6.6, 10.0	42″
56 PER	O Σ 81	04 25 +33 58	5.8, 9.3	4″
κ-1/2 TAU	Σ I 9	04 25 +22 18	4.2, 5.3	340″ P.A. = 175
δ-3 TAU	Kui 17/H VI 101	04 26 +17 56	4.2, 7.5/8.7	1.5″/77″
DOR	Slr 6	04 26 −53 07	7.1, 8.9	1.0″
CAM	Σ 531	04 27 +55 39	7.6, 8.8	1.0″
TAU	Σ 545	04 27 +18 12	6.9, 8.8	19″
ERI	β 311	04 27 −24 05	6.7, 7.1	0.5″
CAE	h 3650	04 27 −40 32	7.0, 8.2	3″
ERI	β 184	04 28 −21 30	7.4, 7.7	1.7″
TAU	Σ 548	04 29 +30 22	6.4, 8.0	15″
θ-1/2 TAU	Σ I 10	04 29 +15 52	3.4, 3.9	337″ P.A. = 348 In Hyades Cluster
80 TAU	Σ 554	04 30 +15 38	5.7, 8.1	1.6″
PER	Σ 552	04 31 +40 01	6.8, 7.2	9″
TAU	LDS 2246	04 31 +16 12	4.8, 6.7	250″ P.A. = 130
81 TAU	β pm	04 31 +15 42	5.5, 9.4	162″
TAU	O Σ 84	04 31 +06 47	7.2, 8.1	9″
ERI	Σ 560	04 31 −13 39	6.3, 9.3	30″
1 CAM	Σ 550	04 32 +53 55	5.8, 6.8	10″
CAM	Es 2607	4 33 +52 48	7.5, 9.5	47″
57 PER	Sh 44 = O ΣΣ 50	04 33 +43 04	6.1, 6.8	120″
ERI	H VI 64	04 33 −03 13	5.8, 9.2	124″
TAU	Σ 559	04 34 +18 01	7.0, 7.0	3″
α DOR	h 3668	04 34 −55 03	3.5, 9.8	75″
RET	h 3670	04 34 −62 49	5.9, 9.3	32″
ERI	Σ 570	04 35 −09 44	6.7, 7.6	13″
ERI	h 3664	04 35 −25 02	7.4, 10.5	22″
PER	S 451	04 36 + 47 22	7.6, 7.9	56″
α TAU	Σ II 2	04 36 +16 31	0.8–1.0, 11.3	133″ Aldebaran
88 TAU	Sh 45	04 36 +10 10	4.3, 7.8	69″
TAU	O ΣΣ 53	04 37 +00 34	7.6, 7.6	78″
PER	Σ 565	04 38 +42 07	7.5, 8.8	1.3″
TAU	Σ 572	04 38 +26 56	7.2, 7.4	5″
90 TAU	β pm	04 38 +12 31	4.3, 10.4	115″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
ERI	Σ 576	04 38 −13 02	7.3, 7.9	12″
53 ERI	Kui 18	04 38 −14 18	4.0, 7.0	0.7″
σ-1/2 TAU	Σ I 11	04 39 +15 55	4.7, 5.1	438″ P.A. = 195 In Hyades Cluster
2 CAM	Σ 566	04 40 +53 28	5.6, 7.3	0.7″
ERI	β 1236	04 40 −21 15	7.3, 9.0	40″
DOR	h 3683	04 40 −58 57	7.3, 7.5	3″
τ TAU	S 455	04 42 +22 57	4.2, 7.0	63″
PIC	CorO 23	04 42 −47 50	7.5, 9.6	4″
PER	Σ 582	04 44 +42 25	7.5, 10.2	6″
55 ERI	Σ 590	04 44 −08 48	6.7, 6.8	9″
CAM	Σ 587	04 48 +53 07	7.4, 8.9, 9.8	21,″ 28″
ORI	H V 83	04 50 +06 57	7.2, 8.7	96″
π-3 ORI	β pm	04 50 +06 58	3.2, 8.7	90″
CAE	h 3697	04 50 −41 19	6.1, 10.4	13″
ι PIC	Δ 18	04 51 −53 28	5.6, 6.2	13″
CAM	β (no #)	04 52 +63 30	5.4, 9.9	115″
ORI	β 552	04 52 +13 39	6.5, 8.1	0.8″
TAU	β 1237	04 54 +23 33	7.5, 10.1	4″
π-1 ORI	β pm	04 55 +10 09	4.7, 8.9	172″
ORI	O Σ 90	04 55 +08 36	6.9, 8.9	2.0″
62 ERI	Sh 48	04 56 −05 10	5.5, 8.9	66″
CAM	O Σ 88	04 57 +61 45	7.1, 8.8	0.9″
7 CAM	Dem 5	04 57 +53 45	4.5, 7.8	0.7″
ω = 4 AUR	Σ 616	04 59 +37 53	5.0, 8.2	5″
ORI	Sh 49	04 59 +14 33	6.1, 7.4, 9.6	40,″ 53″
LEP	β 314	04 59 −16 23	5.9, 7.5, 10.4	0.8,″ 53″
5 AUR	O Σ 92	05 00 +39 24	6.0, 9.5	4″
TAU	Σ 623	05 00 +27 20	7.0, 8.7	20″
PIC	h 3715	05 00 −49 27	7.2, 9.1	10″
MEN	h 3741	05 00 −78 18	6.3, 10.3	46″
ORI	Σ 627	05 01 +03 37	6.6, 7.0	21″
ERI	Σ 631	05 01 −13 30	7.5, 8.8	6″
MEN	Hrg 2	05 01 −74 20	7.5, 7.9	1.0″
ε AUR	β 554	05 02 +43 49	3.0, 9.2	208″
ORI	S 463	05 02 +11 23	7.2, 10.1	33″
ORI	Σ 630/A 2630	05 02 +01 37	6.5, 7.7/9.5	14″/130″
β CAM	S 459 = O ΣΣ 57	05 03 +60 27	4.1, 7.4	83″
ERI	Σ 636	05 03 −08 40	7.1, 8.5	4″
ORI	J 307	05 04 −02 32	6.8, 9.2	52″
γ CAE	Jc 9	05 04 −35 29	4.7, 8.2	3″
11/12 CAM	Σ I 13	05 06 +58 58	5.2, 6.2	180″ P.A. = 9
TAU	O Σ 95	05 06 +19 48	7.0, 7.6	0.9″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
9 AUR	H VI 35	05 07 +51 36	5.0, 9.4	90″
66 ERI	Σ 642	05 07 −04 39	5.2, 8.4	53″
103 TAU	H V 114	05 08 +24 16	5.5, 8.6	36″
105 TAU	S 466	05 08 +21 42	6.0, 9.0	112″
14 ORI	O Σ 98	05 08 +08 30	5.8, 6.7	0.7″
ERI	Σ 649	05 08 −08 40	5.8, 9.0	22″
COL	h 3728	05 08 −41 13	6.7, 10.1	10″
ORI	A 841	05 10 +75 41	7.3, 9.0	48″
AUR	Σ 644	05 10 +37 18	6.8, 7.0	1.6″
AUR	O ΣΣ 61	05 10 +29 48	6.8, 8.3	69″
TAU	Σ 645	05 10 +28 02	6.0, 9.1	11″
TAU	Bgh (no #)	05 10 +27 33	7.3, 8.9	14″
ORI	O Σ 100	05 10 +08 10	7.3, 10.0	4″
CAM	Σ 633	05 11 +63 36	6.7, 10.3	12″
ORI	Σ 652	05 12 +01 02	6.3, 7.4	1.6″
ι LEP	Σ 655	05 12 −11 52	4.5, 9.9	12″
ρ ORI	Σ 654	05 13 +02 52	4.6, 8.5	7″
κ LEP	Σ 661	05 13 −12 56	4.4, 6.8	2.0″
CAM	Σ 638	05 14 +69 49	7.5, 9.1	5″
ORI	O Σ 517	05 14 +01 58	6.8, 7.0	0.7″
β ORI	Σ 668	05 14 −08 12	0.3, 6.8	19″ Rigel
14 AUR	Σ 653	05 15 +32 41	5.0, 7.4–7.9	15″
ORI	Σ 667	05 15 −07 04	7.2, 8.8	4″
COL	h 3740	05 15 −36 39	6.9, 8.3	24″
R AUR	Espin	05 17 +53 35	6.4, 8.6	48″
16 AUR	O Σ 103	05 18 +33 22	4.5, 10.3	4″
TAU	Σ 674	05 18 +20 08	6.8, 9.7	10″
LEP	S 473	05 18 −15 13	7.0, 8.5	21″
λ AUR	Σ II 3	05 19 +40 06	4.7, 8.5	150″
AUR	Sei 180	05 19 +34 53	7.0, 10.5	7″
TAU	Σ 680	05 19 +20 08	6.2, 9.7	9″
LEP	S 476	05 19 −18 31	6.3, 6.5	40″
LEP	h 3750	05 20 −21 14	4.7, 8.5	4″
AUR	Σ 681	05 21 +46 58	6.6, 9.2	23″ Near Capella
22 ORI	–	05 22 −00 23	4.7, 5.7	242″
LEP	h 3752	05 22 −24 46	5.4, 6.6, 9.1	3,″ 62″ Near GC M79
CAM	Σ 634	05 23 +79 14	5.0, 9.2	26″
23 ORI	Σ 696	05 23 +03 33	5.0, 6.8	32″
ORI	Σ 701	05 23 −08 25	6.1, 8.1	6″
111 TAU	S 478	05 24 +17 23	5.0, 8.0	86″
ORI	Σ 697	05 24 +16 02	7.3, 8.1	26″
ORI	Wnc 2	05 24 −00 52	6.9, 7.0	3″
LEP	CorO 31	05 24 −22 17	7.4, 9.7	18″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
AUR	Σ 698	05 25 +34 51	6.7, 8.3	32″
25 ORI	S 479	05 25 +01 48	4.7, 8.1, 8.3	158,″ 46″
η ORI	Dawes 5/H VI 67	05 25 −02 24	3.1–3.4, 4.9/9.4	1.7″/115″
θ PIC	Δ 20	05 25 −52 19	6.2, 6.7	38″
ORI	Σ 712	05 26 +02 56	6.7, 8.6	3″
LEP	h 3759	05 26 −19 42	5.9, 7.3	27″
LEP	β 319	05 26 −20 43	7.4, 10.5	4″
115 TAU	O Σ 107	05 27 +17 58	5.4, 10.2	10″
ψ-2 ORI	Knott 3	05 27 +03 06	4.6, 8.6	3″
DOR	I 276	05 27 −68 37	6.7, 7.0	1.4″
AUR	S 483	05 28 +33 46	6.8, 8.8, 10.1, 10.1	97,″ 103,″ 109″
β LEP	β 320	05 28 −20 46	3.0, 7.5	2.2″
118 TAU	Σ 716	05 29 +25 09	5.8, 6.7	5″
ORI	Dawes 6	05 29 −03 18	7.0, 7.3	0.5″
ORI	H V 101	05 29 −07 16	6.7, 9.7	49″
ORI	h 2268	05 29 −08 23	7.0, 9.6	26″
AUR	Σ 719	05 30 +29 33	7.5, 9.4	15″
TAU	h 3275	05 30 +18 25	7.6, 7.6	55″
ORI	Σ 721	05 30 +03 09	7.1, 9.1	25″
31 ORI	Σ 725	05 30 −01 06	4.7, 9.7	13″
PIC	Δ 21	05 30 −47 05	5.5, 6.7	198″ P.A. = 270
AUR	O ΣΣ 63	05 31 +39 50	6.5, 7.7	76″
32 ORI	Σ 728	05 31 +05 57	4.4, 5.8	1.2″
33 ORI	Σ 729	05 31 +03 18	5.7, 6.7	1.9″
COL	Δ 22	05 31 −42 19	7.2, 7.8	7″
AUR	Σ 718	05 32 +49 24	7.5, 7.5	8″
TAU	Σ 730	05 32 +17 03	6.1, 6.4	10″
δ ORI	Σ I 14	05 32 −00 18	2.4, 6.8	53″
ORI	Σ 734	05 33 −01 43	6.7, 8.2, 8.4	1.5,″ 30″
α LEP	h 3766	05 33 −17 49	2.6, 11, 12	36,″ 91″
CAM	Σ 704	05 34 +69 40	8.0, 10.3	20″
ORI	H V 118	05 34 −01 02	6.2, 9.8	28″
ORI	O Σ 111	05 35 +10 14	5.6, 9.8	2.9″
λ ORI	Σ 738	05 35 +09 56	3.5, 5.5	4″
ORI	Σ 750	05 35 −04 22	6.5, 8.5	4″ In OC NGC 1981
θ-1 ORI	Σ 748	05 35 −05 23	6.6, 7.5, 5.1, 6.4	9,″ 13,″ 13″ Trapezium − in Orion Nebula (M42/M43)
42 ORI	Dawes 4	05 35 −04 50	4.6, 7.5	1.1″
θ-2 ORI	Σ I 16	05 35 −05 25	5.0, 6.2	52″ In Orion Nebula (M42/M43)
ι ORI	Σ 752	05 35 −05 55	2.9, 7.0	11″
ORI	Σ 747	05 35 −06 00	4.7, 5.5	36″ In field with ι ORI
TAU	Σ 742	05 36 +22 00	7.1, 7.5	4″ Near Crab Nebula (M1)

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
AUR	Σ 736	05 37 +41 50	7.5, 8.6	2.5″
TAU	Σ 749	05 37 +26 55	6.5, 6.6	1.1″
ORI	Σ 754	05 37 −06 04	5.7, 8.9	5″
ORI	O ΣΣ 65	05 38 +00 58	7.4, 8.1	80″
PIC	h 3784	05 38 −46 06	7.5, 9.4	5″
26 AUR	Σ 753	05 39 +30 30	5.5, 8.4	12″
σ ORI	Σ 762	05 39 −02 36	3.7, 8.8, 6.6, 6.3	12,″ 13,″ 42″
ORI	Σ 761	–	8.0, 8.5, 9.0	68″, 8″ In field with σ ORI
LEP	β 321/h 3780	05 39 −17 51	6.7, 7.8/8.9, 7.9, 8.3, 9.5	0.5″/90,″ 76,″ 132,″ 60″ = OC NGC 2017
ORI	Σ 766	05 40 +15 21	7.0, 8.4	10″
LEP	Lal 1	05 40 −20 26	6.9, 7.9	11″
AUR	Σ 764	05 41 +29 29	6.4, 7.1	26″
ζ ORI	Σ 774	05 41 −01 57	1.9, 3.7, 8.5	2.6,″ 60″
ORI	β 1052	05 42 −02 54	6.7, 8.2	0.6″
TAU	Σ 768	05 43 +41 07	7.5, 10.1	19″
TAU	O Σ 115	05 44 +15 04	7.5, 8.3	0.6″
γ LEP	H VI 40	05 44 −22 27	3.6, 6.3	97″
ORI	Σ 789	05 45 +04 00	6.1, 10.2	14″
ORI	Σ 788	05 45 +03 50	7.6, 10.1, 10.4	8,″ 36″
ORI	Σ 790	05 46 −04 16	6.4, 9.0	7″
AUR	O Σ 117	05 48 +30 32	7.3, 10.0	12″
TAU	O ΣΣ 66	05 48 +24 41	7.0, 7.7	94″
TAU	O Σ 118/ΣΣ 67	05 48 +20 52	6.1, 7.6/8.6	0.6″/76″
52 ORI	Σ 795	05 48 +06 27	6.0, 6.0	1.1″
ORI	Σ 797	05 48 +04 42	7.3, 10.1	7″
ORI	Σ 798	05 48 −08 23	7.3, 9.5	21″
CAM	Σ 3115	05 49 +62 48	6.6, 7.5	1.0″
132 TAU	–	05 49 +24 34	5.0, 9.1	4″
AUR	Σ 796	05 50 +31 47	7.2, 8.2	4″
134 TAU	β pm	05 50 +12 39	4.9, 10.3	19″
LEP	β 94	05 50 −14 29	5.7, 8.2	2.4″
CAM	Σ 780	05 51 +65 45	7.0, 8.2, 10.2	4,″ 12″
29 CAM	H IV 125	05 51 +56 55	6.5, 9.5	25″
TAU	Ku 23	05 51 +14 27	6.8, 8.8	0.9″
ν AUR	H V 90	05 52 +39 09	4.0, 9.3	55″
AUR	Σ 799	05 52 +38 34	7.1, 8.2	0.8″
AUR	β 1053	05 35 +37 20	6.9, 8.9	1.4″
ORI	O Σ 123	05 54 +10 15	7.3, 9.1	2.1″
LEP	GAn 2	05 54 −19 42	7.4, 9.7	10″
AUR	Mil 2	05 55 +29 58	7.3, 9.5	11″
α ORI	H VI 39	05 55 +07 24	0.4–1.3, 10.6	176″ Betelgeuse
ORI	Σ 816	05 55 +05 52	6.9, 9.3	4″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
ORI	S 503	05 56 +13 56	6.7, 8.7, 8.4	14,″ 76″
PIC	h 3822	05 57 −53 26	6.6, 7.6	56″
59 ORI	H V 100	05 58 +01 50	5.9, 10.4	36″
ORI	O Σ 124	05 59 +12 48	6.1, 7.4	0.5″
δ AUR	β pm	06 00 +54 17	3.7, 9.5	100″
AUR	H VI 91	06 00 +44 36	6.4, 10.3	36″
θ AUR	O Σ 545	06 00 +37 13	2.7, 7.2	4″
ORI	O Σ 125	06 00 +22 28	7.5, 9.0	1.5″
3 MON	β 16	06 02 −10 36	5.0, 8.0	1.9″
AUR	O Σ 128	06 04 +51 34	6.4, 9.3	40″ Also known as 35 CAM
ORI	Σ 838	06 05 +00 53	7.1, 10.4	40″
PUP	h 3834	06 05 −45 05	6.0, 9.0, 6.4	6,″ 196″ P.A. = 320
PUP	Δ 23	06 05 −48 28	7.3, 7.7	2.6″
ORI	Σ 840	06 06 +10 45	7.2, 9.5	22″
AUR	O Σ 131	06 07 +36 16	7.0, 10.2	1.5″
AUR	O Σ 132	06 08 +37 59	7.1, 10.3	1.6″
ORI	Σ 848	06 08 +13 58	7.3, 8.2	2.3″ In OC NGC 2169
ORI	Σ 855	06 09 +02 30	5.7, 6.7, 9.7	29,″ 118″
AUR	Webb (no #)	06 10 +43 08	7.2, 8.7	44″
ORI	H VI 114	06 10 +15 54	7.2, 10.4	54″
41 AUR	Σ 845	06 12 +48 43	6.2, 6.9	8″
68 ORI	H VI 72	06 12 +19 47	5.8, 9.3	86″
ORI	Σ 867	06 12 +17 23	7.1, 8.6	2.2″
MON	AC 3	06 12 −04 40	6.2, 8.7	0.8″
PIC	I 3	06 12 −61 28	7.3, 7.8	0.9″
DOR	Δ 26	06 12 −65 32	6.9, 8.1	21″
ORI	Kui 24	06 14 +17 54	6.5, 6.5	0.5″
ORI	S 509	06 14 +14 30	7.3, 8.0	170″
ORI	O ΣΣ 71	06 14 +11 48	7.2, 7.6	91″
η GEM	β 1008	06 15 +22 30	3.3–3.9, 6.2	1.8″
71 ORI	h 2302	06 15 +19 09	5.2, 10.5, 10.0	76,″ 86″
ORI	Σ 877	06 15 +14 35	7.5, 8.0	6″
AUR	Σ 872	06 16 +36 09	6.9, 7.4	11″
ORI	β 193	06 16 +03 57	7.5, 10.5, 9.8	18,″ 59″
MON	β 567	06 16 −04 55	6.0, 10.0	4″
PIC	Δ 27	06 16 −59 13	6.5, 7.6	34″
ORI	H V 23	06 17 +15 51	7.3, 9.3	45″
75 ORI	β 96	06 17 +09 57	5.4, 9.5, 8.5	63,″ 117″
CMA	β 18	06 17 −12 03	7.0, 8.7	1.5″
12 GEM	H V 55	06 19 +23 16	7.3, 8.8, 9.7	60,″ 63″
ORI	O ΣΣ 73	06 19 +13 26	6.9, 7.7	72″
CMA	S 516	06 19 −24 58	7.3, 8.3, 7.0	60,″ 300″ P.A. = 243

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
AUR	Σ 888	06 20 +28 26	7.5, 9.6	2.8″
ζ CMA	Smyth (no #)	06 20 −30 04	3.0, 7.6	176″
COL	h 3849	06 20 −39 30	6.7, 8.1	40″
GEM	O ΣΣ 74	06 21 +25 11	7.2, 9.4	58″
CMA	Σ 3116	06 21 −11 46	5.6, 9.7	4″
4 LYN	Σ 881	06 22 +59 22	6.3, 7.7	0.7″
GEM	Σ 899	06 23 +17 34	7.4, 8.0	2.2″
PUP	h3856	06 23 −45 38	6.7, 9.7	34″
8 MON	Σ 900	06 24 +04 36	4.4, 6.6	12″ Sometimes listed as ε MON
MON	J 53	06 24 +02 40	7.1, 9.8	34″
CMA	S 518	06 24 −16 13	7.0, 8.4	16″
CMA	β 568	06 24 −19 47	7.2, 7.5	0.8″
COL	h 3857/Δ 28	06 24 −36 42	5.7, 9.8/6.9	13″/64″
LYN	O ΣΣ 72	06 25 +59 40	7.6, 7.6	134″
COL	h 3858	06 26 −35 04	6.4, 7.6, 8.2	132,″ 4″
COL	h 3860	06 26 −40 59	7.3, 8.8	9″
G PUP	I 156	06 26 −48 11	5.9, 8.4	1.2″
5 LYN	S 514	06 27 +58 25	5.4, 7.9	96″
GEM	O Σ 140	06 27 +15 31	6.9, 9.4	2.8″
MON	Σ 910	06 27 +00 27	7.0, 8.1	66″
MON	Σ 914	06 27 −07 31	6.3, 9.3	21″
CAM	O Σ 136	06 28 +70 32	6.0, 9.8	6″
15 GEM	Sh 70	06 28 +20 47	6.7, 8.2	25″
MON	Σ 915	06 28 +05 16	7.5, 8.5	6″
10 MON	β pm	06 28 −04 46	5.1, 9.3, 9.3	77,″ 81″ In OC NGC 2232
ν GEM	O ΣΣ 77	06 29 +20 13	4.1, 8.0	112″
β MON	Σ 919	06 29 −07 02	4.6, 5.0, 5.3	3,″ 7″
CMA	h 3863	06 29 −22 35	6.9, 8.7	2.6″
CMA	β 753	06 29 −32 22	5.9, 7.6	1.2″
COL	Δ 29	06 29 −40 22	7.4, 7.8	66″
MEN	h 3888	06 29 −78 54	7.4, 9.8	36″
CMA	h 3864	06 30 −14 57	6.9, 9.8	22″
PUP	R 65/Δ 30	06 30 −50 14	6.0, 6.1/ 8.0	0.8″/12″
GEM	O Σ 143	06 31 +16 56	6.3, 9.4	8″
MON	Σ 921	06 31 +11 15	6.1, 9.1	16″
COL	I 4	06 31 −40 27	7.3, 7.5	0.8″
20 GEM	Σ 924	06 32 +17 47	6.3, 6.9	20″
GEM	O Σ 145	06 32 +15 42	7.2, 10.0	1.5″
MON	O Σ 146	06 32 +11 40	6.0, 9.6	31″
MON	Σ 926	06 32 +05 46	7.2, 8.6	11″
μ PIC	h 3874	06 32 −58 45	5.6, 9.3	2.5″
CMA	h 3869	06 33 −32 02	5.7, 7.9	25″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
AUR	Σ 918	06 34 +52 28	7.3, 8.2, 10.0	5,″ 137″
AUR	O Σ 147	06 34 +38 05	6.8, 8.7, 9.9	44,″ 46″
MON	h 394	06 34 −03 04	7.3, 9.3	57″
CMA	h 3871	06 34 −29 38	7.1, 8.2	8″
AUR	Σ 929	06 35 +37 43	7.4, 8.4	6″
COL	β 754	06 35 −34 01	7.4, 7.7	0.9″
COL	β 755	06 35 −36 47	5.9, 6.9	1.5″
GEM	Ho 341	06 36 +13 42	7.0, 9.2	65″
CMA	Howe 13	06 36 −16 06	7.4, 7.5	13″
ν-1 CMA	Sh 73	06 36 −18 40	5.8, 7.4	18″
PUP	CorO 39	06 36 −48 17	7.5, 9.9	10″
CMA	H II 60	06 37 −22 37	6.4, 9.3	9″
COL	Rst 4819	06 37 −36 59	6.1, 6.9	0.6″
COL	HdO 196	06 37 −38 09	6.0, 10.0	25″
GEM	S 529	06 38 +12 11	7.6, 9.0	50″
PIC	I 5	06 38 −61 32	6.4, 8.4	2.4″
GEM	O Σ 151	06 39 +27 48	7.3, 10.2	29″
ψ-2 AUR	β pm	06 39 +42 29	4.8, 10.3	52″
AUR	Σ 941	06 39 +41 35	7.3, 8.2, 10.2	1.9,″ 83″
PUP	Δ 31	06 39 −48 13	5.1, 7.4	13″
LYN	Σ 936	06 40 +58 06	7.3, 9.0	1.2″
AUR	Σ 945	06 40 +40 58	7.3, 8.2	0.7″
54 AUR	O Σ 152	06 40 +28 16	6.2, 7.9	0.9″
15/S MON	Σ 950	06 41 +09 53	4.6, 7.8, 9.9	3,″ 17″ In OC NGC 2264
MON	Σ 954	06 41 +09 28	7.2, 10.2	13″ In Cone Nebula (NGC 2264)
MON	Σ 953	06 41 +08 59	7.1, 7.7	7″
PSC	h 5443	06 41 −40 21	6.1, 9.4	16″
VOL	I 351	06 41 −71 47	6.5, 10.0	16″
CMA	β 19	06 42 −16 00	7.1, 9.0	3″
CMA	β 195	06 42 −23 14	7.4, 10.4	6″
PUP	Δ 32	06 42 −38 24	6.6, 7.7	8″
CMA	S 534	06 43 −22 27	6.3, 8.3	18″
PUP	h 3889	06 43 −50 27	7.0, 8.8	42″
AUR	O Σ 154	06 44 +40 37	7.1, 9.7	23″
ε GEM	S 533	06 44 +25 08	3.1, 9.6	111″
CAR	Δ 34	06 44 −54 42	6.6, 6.8	130″
LYN	Σ 946	06 45 +59 27	7.3, 9.1	4″
GEM	Σ 957	06 45 +30 50	7.5, 9.4	4″
GEM	O Σ 155	06 45 +24 40	7.3, 10.2	16″
α CMA	AGC 1	06 45 −16 43	–1.5, 8.5	8″ Sirius
CMA	CorO 44	06 45 −30 35	6.5, 9.8	4″
12 LYN	Σ 948	06 46 +59 27	5.4, 6.0, 7.0	1.9,″ 9″
CMA	h 3891	06 46 −30 57	5.7, 8.2	5″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
ψ-5 AUR	Sh 75	06 47 +43 35	5.3, 8.7	31″
GEM	O Σ 156	06 47 +18 12	6.8, 7.0	0.5″
LYN	Σ 958	06 48 +55 42	6.3, 6.3	5″
MON	O Σ 157	06 48 +00 20	7.5, 7.8	0.5″
MEN	h 3911	06 48 −76 51	6.9, 10.4	22″
CMA	AC 4	06 49 −15 09	5.4, 8.1	0.9″
CMA	β 324/S 537	06 50 −24 05	6.6, 7.9/8.3	1.8″/30″
CMA	S 538	06 50 −24 09	7.2, 8.2	27″
CMA	H V 108	06 50 −31 42	5.8, 7.7	43″
ψ-7 AUR	β pm	06 51 +41 47	5.0, 10.0	40″
MON	WNO (no #)	06 52 −05 10	6.6, 10.4	58″
14 LYN	Σ 963	06 53 +59 27	5.6, 6.8	0.7″
59 AUR	Σ 947	06 53 +38 52	6.1, 10.2	22″
GEM	O Σ 160	06 54 +21 10	6.7, 9.7	1.5″
MON	O ΣΣ 79	06 54 +06 41	7.2, 7.5	116″
MON	Σ 987	06 54 −05 51	7.1, 7.2	1.3″
AUR	Σ 978	06 56 +37 55	6.8, 9.6	17″
CMA	Stone 16	06 56 −25 31	7.4, 10.4	4″
38 GEM	Σ 982	06 55 +13 11	4.7, 7.8, 10.3	7,″ 118″
17 CMA	H V 65	06 55 −20 24	5.8, 8.7, 9.0	44,″ 49″
μ CMA	Σ 997	06 56 −14 03	5.3, 7.1	3″
π CMA	H N 123	06 56 −20 08	4.6, 9.6	12″
15 LYN	O Σ 159	06 57 +58 25	4.8, 5.9	0.9″
CMA	S 541	06 57 −22 39	7.5, 8.5	23″
GEM	O ΣΣ 80	06 58 +14 14	7.3, 7.4, 8.4	124,″ 80″
CMA	B 122	06 58 −24 38	5.8, 7.1	1.0″
ε CMA	CapO 7	06 59 −28 58	1.5, 7.5	7″ Adhara
CMA	HdO 198	06 59 −31 00	6.4, 9.0, 10	35,″ 70″
GEM	Σ 1007	07 01 +12 43	7.4, 7.7	68″
GEM	h 3288	07 02 +12 35	7.3, 8.7	38″
MON	β 573	07 02 −10 53	7.1, 7.6	1.0″
CAR	Δ 39	07 03 −59 11	5.8, 6.8	1.4″
CAM	Σ 973	07 04 +75 14	7.2, 8.2	13″
MON	O ΣΣ 82	07 04 +01 29	6.5, 7.6	90″
PUP	Δ 38	07 04 −43 36	5.6, 6.7, 8.1	21,″ 185″
CMA	Σ 1016	07 05 −11 31	7.4, 9.5	5″ In DN IC 2177
LYN	Σ 1009	07 06 +52 45	6.9, 7.0	4″
GEM	O Σ 164	07 06 +24 52	7.3, 10.3	14″
MON	Dem 12/Σ 1019	07 06 −10 40	5.5, 10.1/9.6	6″/38″
PUP	h 3928	07 06 −34 47	6.5, 7.8, 9.7	2.7,″ 38″
PUP	h 3931	07 06 −42 20	7.2, 10.0, 8.8	57,″ 72″
FN CMA	β 328/Σ 1026	07 07 −11 18	5.7, 6.9/9.0	0.6″/18″
GEM	β pm	07 08 +15 32	7.4, 7.5	172″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
MON	Σ 1029	07 08 −04 41	7.5, 8.0	1.7″
δ CMA	–	07 08 −26 24	1.9, 8.8	265″
CAR	h 3941	07 09 −60 23	7.4, 7.9	0.5″
γ-2 VOL	Δ 42	07 09 −70 30	3.9, 5.4	14″
GEM	O Σ 83	07 10 +25 44	7.2, 7.8	120″
CAR	Rmk 5	07 10 −55 35	7.5, 7.6	7″
CMA	h 3934	07 11 −21 48	6.9, 8.5	14″
PUP	β 757	07 12 −36 33	6.0, 8.4	.5″
GEM	Σ 1037	07 13 +27 13	7.2, 7.3	1.1″
GEM	O Σ 167	07 14 +32 09	7.3, 10.4	5″
GEM	β pm	07 14 +24 43	6.7, 10.2	28″
CMA	h 3938	07 14 −22 54	6.3, 9.1	19″
GEM	Σ 1053	07 17 +24 32	7.1, 9.8	14″
CMA	h 3945	07 17 −23 19	5.0, 5.8	27″
CMA	BrsO 2	07 17 −30 54	6.3, 7.8	38″
π PUP	Δ 43	07 17 −37 06	2.9, 7.9	69″ In OC Cr 135
λ GEM	Σ 1061	07 18 +16 32	3.6, 10.7	10″
PUP	Jc 10	07 18 −36 44	4.7, 5.1	240″ P.A. = 98 In OC Cr 135
PUP	I 7	07 18 −46 59	7.1, 8.4	0.8″
CMA	Lal 53	07 19 −22 03	7.6, 7.7	4″ Near OC NGC 2367
τ CMA	h 3948	07 19 −24 57	4.4, 8.8	85″ In OC NGC 2362
δ GEM	Σ 1066	07 20 +21 59	3.6, 8.2	6″
CMI	Σ 1074	07 20 +00 24	7.4, 7.8	0.6″
CAR	Rmk 6	07 20 −52 19	6.0, 6.5	9″
PUP	Δ 45	07 21 −48 32	6.8, 7.7	23″
CAR	h 3958	07 21 −52 12	6.9, 9.1	8″
CAR	BrsO (no #)	07 22 −61 57	7.1, 8.4	179″
20 LYN	Σ 1065	07 22 +50 09	7.5, 7.7	15″
PUP	h 3957	07 22 −35 55	7.1, 7.9	7″
19 LYN	Σ 1062	07 23 +55 17	5.8, 6.7, 7.6	15,″ 215″
MON	Σ 1084	07 24 −03 59	7.2, 10.0	15″
η CMA	Smyth (no #)	07 24 −29 18	2.5, 6.8	180″ P.A. = 285
LYN	O ΣΣ 84	07 25 +56 34	7.6, 7.7	114″
CMA	β 199	07 25 −21 10	7.2, 8.1	1.7″
CMA	Δ 47	07 25 −31 49	5.4, 7.6	98″
PUP	h 3966	07 25 −37 17	6.9, 6.9	7″
GEM	Σ 1083	07 26 +20 30	7.3, 8.1	7″
GEM	Σ 1090	07 26 +18 31	7.3, 8.2, 9.9	61,″ 20″
GEM	Σ 1088	07 26 +14 06	7.4, 9.4	11″
CAM	Σ 1051	07 27 +73 05	7.1, 9.2, 7.8	1.1,″ 32″
GEM	O Σ 171	07 27 +31 37	7.3, 10.1	1.1″
GEM	Σ 1094	07 27 +15 19	7.4, 8.4	2.5″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
PUP	h 3969	07 27 −34 19	7.1, 8.1	18″
GEM	S 548	07 28 +22 08	7.0, 8.9	36″
63 GEM	Sh 368	07 28 +21 27	5.3, 10.9, 10.4	43,″ 146″
CMA	β 332/Σ 1097	07 28 −11 33	6.2, 7.4, 9.5/8.5	0.7,″ 23″/20″
PUP	S 550	07 28 −18 30	6.9, 7.6	39″
LYN	β 758	07 29 +48 11	5.6, 10.2	17″
GEM	O ΣΣ 85	07 29 +24 39	7.4, 9.8	59″
GEM	O ΣΣ 86	07 29 +14 22	7.0, 8.8	56″
PUP	Σ 1104	07 29 −15 00	6.4, 7.6	1.9″
PUP	Δ 49	07 29 −31 51	6.3, 7.0	9″
σ PUP	Δ 51	07 29 −43 18	3.3, 8.8	22″
CMI	Σ 1103	07 31 +05 15	7.1, 8.6	4″
CAM	Es 1895	07 32 +62 30	6.9, 9.2	10″
MON	Σ 1112	07 32 −08 53	6.0, 8.7	24″
GEM	Σ 1108	07 33 +22 53	6.6, 8.2	12″
n PUP	H N 19	07 34 −23 28	5.8, 5.9	10″
PUP	h 3986	07 34 −50 50	7.7, 9.2	44″
α GEM	Σ 1110	07 35 +31 53	1.9, 3.0, 9.8	4,″ 71″ Castor
PUP	h 3982	07 35 −28 22	4.6, 9.1, 10.4	38,″ 43″
VOL	h 3997	07 35 −74 17	7.0, 7.1	1.9″
LYN	O Σ 174	07 36 +43 02	6.6, 8.3	2.1″
PUP	Σ 1120	07 36 −14 30	5.7, 9.6	20″
PUP	Σ 1121	07 37 −14 30	7.0, 7.3	7″ In OC M47
PUP	S 557	07 38 −14 26	6.5, 9.3	64″
k PUP	H III 27	07 39 −26 48	4.4, 4.6	10″
PUP	h 3994	07 39 −49 03	7.2, 10.0, 10.4	15,″ 23″
CMI	Σ 1126	07 40 +05 14	6.6, 7.0	0.9″ In field with Procyon
d-2 PUP	I 160	07 40 −38 08	5.8, 8.5	1.2″
ζ VOL	Δ 57	07 42 −72 36	4.0, 9.7	16″
24 LYN	h 2405	07 43 +58 43	5.0, 9.5	55″
κ GEM	O Σ 179	07 44 +24 24	3.7, 8.2	7″
PUP	Δ 55	07 44 −50 27	6.7, 7.6	52″
β GEM	H VI 42/β 580/Σ II 5	07 45 +28 02	1.1, 8.8/9.6/10.3	201,″ 234,″ 260″ Pollux
2 PUP	Σ 1138	07 46 −14 41	6.0, 6.7	17″
CAM	Σ 1127	07 47 +64 03	7.0, 8.5, 9.7	5,″ 12″
PUP	Δ 56	07 47 −41 30	7.0, 7.8	50″
π GEM	Σ 1135	07 48 +33 25	5.3, 10.4	92″
GEM	Σ 1140	07 48 +18 20	7.0, 8.7	6″
5 PUP	Σ 1146	07 48 −12 12	5.7, 7.3	1.3″
PUP	β pm	07 48 −15 59	6.7, 6.8	130″
PUP	Knott 4	07 48 −16 01	6.5, 6.6	129″
p PUP	Jc 11	07 49 −46 22	4.1, 9.0	59″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
CAR	CorO 60	07 50 −55 05	7.5, 9.1	4″
MON	Σ 1154	07 52 −03 03	7.1, 9.3	2.8″
PUP	H III 28	07 52 −13 52	6.6, 10.5	19″
9 PUP	β 101	07 52 −13 54	5.6, 6.5	0.5″
PUP	Howe 65	07 52 −34 42	5.1, 8.6	4″
CAR	h 4018	07 52 −59 37	7.5, 10.0	5″
CMI	O Σ 182	07 53 +03 23	7.5, 8.0	1.0″
PUP	See 91	07 56 −43 51	6.6, 6.9	0.7″
PUP	I 26	07 57 −47 53	6.7, 7.3	0.5″
14 CMI	Sh 87	07 58 +02 13	5.4, 9.4, 9.9	99,″ 133″
CAR	h 4031	07 58 −60 51	7.1, 7.7	6″ In OC NGC 2516
PUP	I 30	07 59 −47 41	7.5, 8.7	1.7″
PUP	Δ 59	07 59 −49 59	6.2, 6.2	16″
PUP	h 4032	08 00 −47 18	6.7, 9.4	29″
PUP	β 333	08 01 −22 20	7.2, 9.2, 7.7	1.6,″ 43″
CAR	Δ 60	08 01 −54 31	6.1, 7.9	40″
CAM	Sh 86	08 02 +63 05	6.2, 7.5	51″
PUP	β 202	08 02 −27 13	6.9, 9.9	8″
PUP	I 8	08 02 −44 40	6.7, 9.2	2.3″
CNC	O Σ 186	08 03 +26 16	7.5, 8.2	0.8″
PUP	h 4037	08 03 −27 33	7.2, 8.4, 9.2	7,″ 64″
PUP	h 4035	08 03 −32 28	6.0, 9.0	36″
PUP	h 4038	08 03 −41 19	5.5, 9.0	25″
CMI	Σ 1182	08 05 +05 50	7.5, 8.8	4″
CAR	Δ 62	08 05 −62 50	6.5, 7.8	87″
CAM	Σ 1159	08 06 +71 47	7.4, 9.7	34″
CNC	Σ 1177	08 06 +27 32	6.7, 7.4	4″
MON	Σ 1183	08 06 −09 15	6.2, 7.8	31″
PUP	h 4046	08 06 −33 34	6.3, 8.4	22″
PUP	Δ 61	08 07 −27 07	7.0, 9.0	70″
PUP	S 563	08 08 −19 52	7.0, 7.6	134″
CAR	h 4053	08 08 −61 05	6.9, 8.5, 10.5	12,″ 20″
ε VOL	Rmk 7	08 08 −68 37	4.4, 7.3	6″
11 CNC	Σ 1186	08 09 +27 29	7.1, 10.1	3″
ζ MON	Σ 1190	08 09 −02 59	4.4, 10.1, 9.7	33,″ 65″
PUP	Gli 80	08 09 −39 31	7.6, 8.5	40″
PUP	Δ 63	08 10 −42 38	6.6, 7.5	6″
γ VEL	Δ 65	08 10 −47 20	1.8, 4.1, 7.3, 9.4	41,″ 2.6,″ 94″
CNC	Σ 1187	08 10 +31 13	7.2, 8.0	3″
13 CNC	β pm	08 10 +25 51	6.8, 9.8	88″
19 PUP	β 1064/Sh 291	08 11 −12 56	4.7, 8.9/9.4	61″/69″
PUP	h 4057	08 11 −42 59	4.8, 9.8	26″
ζ CNC	Σ 1196	08 12 +17 39	5.3, 6.3, 6.2	0.9,″ 6″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
VEL	See 96	08 12 −46 16	6.2, 7.7	0.6″
LYN	O Σ 189	08 15 +43 02	6.8, 9.9	4″
CNC	H VI 78	08 14 +17 41	6.4, 9.2	60″
CNC	Σ 1202	08 14 +10 51	7.4, 9.5	2.4″
PUP	Δ 67	08 14 −36 19	5.0, 6.0	67″
h-2 PUP	h 4062	08 14 −40 21	4.4, 9.5	51″
VEL	h 4069	08 14 −45 50	5.8, 8.7	32″
VEL	Gli 87	08 14 −47 00	5.1, 10.1	35″
CAR	Rmk 8	08 15 −62 55	5.3, 7.6	4″
VOL	I 9	08 15 −73 48	7.4, 7.6	1.0″
CNC	Ho 524	08 16 +18 42	7.5, 10.5	4″
HYA	Σ 1210	08 16 +02 48	7.3, 9.5	16″
PUP	β 454	08 16 −30 56	6.5, 8.2	1.9″
PUP	h 4063	08 16 −37 22	7.4, 9.3	18″
UMA	Σ 1192	08 16 +60 23	6.5, 10.2, 9.9	2.8,″ 49″
PUP	h 4073	08 18 −37 22	7.2, 7.8	1.9″
CAR	h 4084	08 18 −59 10	6.5, 9.8, 9.9	42,″ 3″
LYN	O ΣΣ 91	08 20 +35 03	7.1, 8.8	93″
κ VOL	BrsO (no #)	08 20 −71 31	5.3, 5.6, 7.7	65,″ 38″
UMA	Σ 1193	08 21 +72 24	6.2, 9.7	43″
HYA	Σ 1216	08 21 −01 36	7.1, 7.4	0.7″
CAM	O Σ 188	08 22 +74 49	6.5, 9.8	10″
B VEL	I 67	08 22 −48 29	5.1, 6.1	0.7″
CHA	h 4109	08 23 −76 26	7.2, 8.2	26″
LYN	S 565 = O ΣΣ 93	08 25 +42 00	6.2, 8.6	84″
CNC	O Σ 191	08 25 +20 09	7.4, 8.6	38″
PUP	S 568	08 25 −24 03	5.5, 8.4	42″
CNC	H VI 109	08 26 +07 34	5.1, 9.2	32″
PUP	h 4093	08 26 −39 04	6.5, 7.1	8″
PUP	Rst 4888	08 26 −42 46	6.6, 6.8	0.5″
VEL	Δ 69	08 26 −51 44	5.1, 9.6	26″
φ-2 CNC	Σ 1223	08 27 +26 56	6.2, 6.2	5″
24 CNC	Σ 1224	08 27 +24 32	6.9, 7.5	6″
HYA	Σ 1233	08 29 −02 31	6.4, 10.5	18″
VEL	h 4102	08 29 −42 35	6.4, 9.3	68″
VEL	h 4104	08 29 −47 56	5.5, 7.2, 9.2	3,″ 19″
VEL	Δ 70	08 30 −44 43	5.2, 7.0	4″
VEL	h 4107	08 31 −39 04	6.5, 8.2, 9.1	4,″ 30″
VEL	Δ 71	08 31 −40 31	7.0, 7.7	64″
θ CNC	h 2452	08 32 +18 06	5.4, 10.0	70″
VEL	Slr 8	08 32 −53 13	6.1, 7.1	0.8″
PYX	β 205	08 33 −24 36	6.8, 7.1	0.6″
CNC	Σ 1245	08 36 +06 37	6.0, 7.2	10″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
VEL	h 4119	08 37 −49 26	7.4, 10.4	10″
HYA	h 99	08 38 −06 48	6.8, 8.3	60″
PYX	β 207	08 39 −19 44	6.6, 9.2	4″
PYX	β 208	08 39 −22 40	5.4, 6.8	1.3″
CAR	h 4128	08 39 −60 19	6.8, 7.5	1.2″
39–40 CNC	β pm	08 40 +20 00	6.5, 6.6	150″ In Beehive Cluster (M44)
CNC	Σ 1254	08 40 +19 40	6.4, 8.9, 8.6, 8.9	20,″ 63,″ 83″ In Beehive Cluster
CNC	S 571	08 40 +19 33	7.3, 7.5, 6.7	45,″ 93″ In Beehive Cluster
ε CNC	S 574	08 40 +19 33	6.3, 7.4	135″ In Beehive Cluster
HYA	Σ 1255	08 40 +05 46	7.3, 8.6	26″
ζ PYX	h 4120	08 40 −29 34	5.0, 9.6	52″
VEL	CorO 74	08 40 −40 16	5.2, 9.1	4″
VEL	Δ 72	08 40 −42 23	7.2, 8.0	131″
VEL	h 4127	08 41 −46 39	3.8, 10.2	38″
VEL	h 4126	08 40 −53 03	5.2, 8.7	17″ In OC IC 2391
CAR	h 4130	08 41 −57 33	6.5, 8.3	3″
VEL	BrsO 18	08 42 −53 07	4.8, 5.5, 9.9	76,″ 60″ At edge of OC IC 2391
UMA	Σ 1258	08 43 +48 52	7.5, 7.8	10″
γ CNC	β pm	08 43 +21 28	4.7, 8.7	106″
F HYA	S 579	08 44 −07 14	4.7, 8.2	79″
d VEL	h 4133	08 44 −42 39	4.1, 10.3	45″
HYA	Σ 1270	08 45 −02 36	6.9, 7.5	5″
δ VEL	I 10	08 45 −54 43	2.1, 5.1	1.1″
CAR	Rmk 9	08 45 −58 43	6.9, 6.9	4″
VEL	Jc 13	08 46 −42 34	7.3, 8.8	2.1″
ι CNC	Σ 1268	08 47 +28 46	4.1, 6.0	31″
ε HYA	Σ 1273	08 47 +06 25	3.5, 6.7	3″
PYX	Gli 101	08 47 −34 36	6.7, 10.5	52″
VEL	I 70	08 48 −38 57	7.2, 9.2	1.3″
LYN	Σ 1274	08 49 +38 21	7.4, 9.4	9″
PYX	h 4144	08 50 −35 56	7.0, 9.0	2.4″
LYN	Σ 1282	08 51 +35 04	7.6, 7.8	3″
f VEL	HdO 205	08 51 −46 32	4.9, 9.0	3″
CNC	O ΣΣ 96	08 52 +25 43	7.5, 8.7	45″
HYA	Σ 1290	08 52 +04 28	7.4, 9.2	2.8″
15 HYA	β 587/H V 20	08 52 −07 11	5.5, 7.4/9.7	1.1″/46″
σ-1 CNC	S 583	08 53 +32 28	5.7, 10.2	77″
53 CNC	h 460	08 53 +28 16	6.2, 9.7	43″
VEL	CapO 9	08 53 −52 08	6.6, 8.2	2.9″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
57 CNC	Σ 1291	08 54 +30 35	6.1, 6.4	1.5″
VEL	h 4150	08 54 −41 50	7.3, 10.0	18″
HYA	S 584	08 55 −11 22	6.8, 9.2	66″
HYA	S 585	08 55 −18 14	5.8, 7.0	67″
17 HYA	Σ 1295	08 56 −07 58	6.7, 6.9	4″
H VEL	R 87	08 56 −52 43	4.7, 7.7	2.6″
VEL	Δ 73	08 56 −55 32	7.7, 8.2	65″
HYA	Arg 72	08 57 −17 26	7.2, 7.4	4″
VEL	See 108/Gli 102	08 57 −43 15	7.4, 9.9/10.0, 8.8	3″/43,″ 46″
CAR	Δ 74	08 57 −59 14	4.9, 6.6	40″
VOL	h 4164	08 57 −66 12	7.3, 10.1	11″
UMA	β 408	08 59 +63 26	7.2, 9.7	2.9″
ι UMA	h 2477	08 59 +48 03	3.1, 9.2	4″
σ-3 CNC	Sh 100	09 00 +32 25	5.6, 9.4	90″
VEL	Gli 104	09 00 −49 33	7.1, 9.7	9″
LYN	Kui 37	09 01 +41 47	4.1, 6.2	0.6″ Formerly 10 UMA
σ-4 CNC	Σ 1298	09 01 +32 15	6.0, 8.6	4″
HYA	β 409	09 01 −09 11	7.3, 10.1	10″
67 CNC	Sh 101	09 02 +27 54	6.1, 9.2	104″
VEL	h 4165	09 02 −52 11	5.6, 6.6	0.7″
PYX	h 4166	09 03 −33 36	7.1, 7.9	14″
VEL	h 4177	09 04 −56 20	7.2, 8.8, 9.7	13,″ 34″
CNC	Σ 1311	09 07 +22 59	6.9, 7.1	7″
σ-2 UMA	Σ 1306	09 10 +67 08	4.9, 8.9, 9.3	4,″ 205″
PYX	β 410	09 10 −25 48	7.3, 8.8	1.8″
ε PYX	H N 96	09 10 −30 22	5.6, 9.9	18″
τ UMA	H V 73	09 11 +63 31	4.7, 10.3	57″
CAR	h 4190	09 12 −57 58	6.6, 10.1	8″
VEL	h 4188	09 12 −43 37	6.0, 6.8	2.8″
UMA	Σ 1315	09 13 +61 41	7.3, 7.7	25″
UMA	Σ 1321	09 14 +52 41	7.6, 7.7	17″
θ HYA	h 2489	09 14 +02 19	3.9, 9.8	21″
z VEL	h 4191	09 14 −43 14	5.3, 9.2	6″
VEL	I 11	09 15 −45 33	6.6, 7.7	0.8″
CAR	h 4206	09 17 −74 54	5.3, 9.6, 10.3	7,″ 46″
LYN	Σ 1333	09 18 +35 22	6.6, 6.7	1.9″
HYA	Σ 1336	09 18 +00 33	7.0, 10.2	40″
38 LYN	Σ 1334	09 19 +36 48	3.9, 6.1	2.6″
27 HYA	Sh 105/Doolittle	09 20 −09 33	4.9, 7.0/9.1	229″/9″ P.A. = 212
UMA	O Σ 199	09 21 +51 16	6.2, 10.0	6″ Formerly 37 LYN
LYN	Σ 1338	09 21 +38 11	6.7, 7.1	1.1″
PYX	h 4200	09 21 −31 46	7.4, 7.9	3″
UMA	Σ 1340	09 22 +49 33	7.1, 9.0	6″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
HYA	Σ 1347	09 23 +03 30	7.3, 8.3	21″
HYA	Σ 1348	09 24 +06 21	7.5, 7.6	1.9″
UMA	O Σ 200	09 25 +51 34	6.5, 8.6	1.3″
κ LEO	β 105	09 25 +26 11	4.5, 9.7, 10.5	2.4,″ 53″
VEL	CorO 83	09 26 −53 15	7.1, 10.1	19″
CAR	h 4213	09 26 −61 57	5.8, 9.6	9″
HYA	Σ 1355	09 27 +06 14	7.5, 7.5	2.5″
PYX	Jc 5	09 27 −28 47	6.5, 7.2	0.6″
ω LEO	Σ 1356	09 28 +09 03	5.7, 7.3	0.6″
3 LEO	H IV 47	09 28 +08 11	5.7, 10.4	25″
α HYA	H VII 111	09 28 −08 40	2.0, 9.5	283″
HYA	Σ 1357	09 28 −09 59	6.9, 10.4	8″
CAR	I 830	09 28 −57 20	7.5, 9.5	18″
UMA	S 598	09 29 +45 36	5.5, 7.8, 9.7	72,″ 84″
τ-1 HYA	h 1167	09 29 −02 46	4.6, 7.3	66″
VEL	Δ 77	09 29 −44 32	7.0, 7.1	108″
UMA	Σ 1349	09 31 +67 32	7.5, 9.0	19″
7 LMI	h 1166	09 31 +33 39	6.0, 9.7, 9.7	63,″ 98″
ζ-1 ANT	Δ 78	09 31 −31 53	6.1, 6.8	8″ Near ζ-2 ANT
ψ VEL	Copeland (no #)	09 31 −40 28	3.9, 5.1	0.5″
23 UMA	Σ 1351	09 32 +63 04	3.7, 9.2	23″
6 LEO	Sh 107	09 32 +09 43	5.2, 9.3	37″
HYA	Σ 1365	09 32 +01 28	7.4, 8.0	3″
LEO	H N 29	09 33 +28 22	6.5, 10.5	30″
HYA	β 910	09 33 −14 00	7.3, 10.2, 10.0	7,″ 170″
ANT	h 4218	09 33 −36 24	7.6, 9.8	6″
CAR	R 123	09 33 −57 58	7.5, 7.6	1.9″
OCT	Δ 82	09 33 −86 01	7.1, 7.6	15″
VEL	h 4220	09 34 −49 00	5.5, 6.2	2.0″
VEL	Δ 79	09 34 −49 45	7.5, 7.6	140″
LYN	Σ 1369	09 35 +39 58	7.0, 8.0	24″
7 LEO	H V 58	09 36 +14 23	6.3, 9.4	41″
HYA	S 604	09 36 −19 35	6.3, 9.4	51″
VEL	R 125	09 36 −48 45	6.3, 10.3	3″
VEL	See 115	09 37 −53 40	6.1, 6.3	0.7″
DRA	Σ 1362	09 38 +73 05	7.0, 7.2	5″
LMI	Σ 1374	09 41 +38 57	7.3, 8.7	3″
o LEO	H VI 76	09 41 +09 54	3.5, 9.5	85″
VEL	R 129	09 43 −55 50	7.4, 7.6	3″
SEX	Σ 1377	09 44 +02 38	7.5, 10.5	4″
VEL	h 4245	09 46 −45 55	6.8, 9.6	9″
υ CAR	Rmk 11	09 47 −65 04	3.0, 6.0	5″
u VEL	h 4254	09 50 −45 44	5.1, 9.6	66″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
ϕ UMA	O Σ 208	09 52 +54 04	5.3, 5.4	0.5″
UMA	O Σ 209	09 53 +50 37	7.5, 10.5	5″
γ SEX	AC 5	09 53 −08 06	5.4, 6.4	0.6″
9 SEX	S 605	09 54 +04 57	6.9, 8.4	52″
ANT	β 215	09 54 −28 00	7.0, 9.0	1.7″
VEL	Δ 81	09 54 −45 17	5.8, 8.2	5″
CAR	Rmk 12	09 55 −69 11	6.9, 8.9	9″
VEL	h 4269	09 58 −48 25	6.1, 10.1	14″
LEO	H V 63	09 59 +10 58	7.4, 9.5	51″
VEL	HdO 209	10 01 −56 06	6.4, 9.9	15″
VEL	Δ 83	10 02 −54 59	7.7, 7.9	111″
VEL	h 4282	10 03 −52 03	7.4, 8.3	50″
HYA	Sh 110	10 04 −18 06	6.2, 7.0	21″
VEL	h 4283	10 04 −51 48	7.3, 8.4	8″
CAR	Hrg 47	10 04 −61 53	6.3, 7.9	1.2″
VEL	h 4284	10 05 −45 54	7.4, 9.5	7″
LMI	Σ 1405	10 06 +39 35	7.3, 10.5	22″
VEL	I 173	10 06 −47 22	5.3, 7.1	0.9″
α LEO	Σ II 6	10 08 +11 58	1.4, 8.2	176″ Regulus
HYA	β 911	10 08 −19 45	7.3, 9.3	66″
CAR	h 4292	10 09 −65 49	5.3, 9.5	60″
CAR	I 13	10 10 −68 41	6.5, 6.6	0.7″
VEL	I 361	10 13 −47 29	7.5, 10.1	5″
LEO	O Σ 215	10 16 +17 44	7.2, 7.5	1.4″
ζ +35 LEO	Σ I 18	10 17 +23 25	3.4, 5.9	330″ P.A. = 340
UMA	Σ 1415	10 18 +71 04	6.7, 7.3	16″
VEL	R 140	10 19 −56 01	7.5, 8.2	3″
CAR	h 4306	10 19 −64 41	6.3, 6.5	2.4″
γ LEO	Σ 1424	10 20 +19 51	2.4, 3.6	5″ Algieba
ANT	h 4304	10 20 −33 08	7.6, 9.8	9″
VEL	h 4307	10 20 −51 34	7.0, 10.5	14″
CAR	R 141	10 20 −67 10	7.5, 8.3	1.8″
HYA	h 4305	10 21 −23 39	7.5, 9.8	18″
J VEL	Rmk 13	10 21 −56 03	4.5, 7.2, 9.2	7,″ 36″
LEO	O Σ 216	10 23 +15 21	7.4, 10.3	2″
SEX	Sh 115	10 23 +05 42	6.6, 9.1	58″
HYA	h 4311	10 23 −13 23	6.6, 9.7	4″
LMI	O ΣΣ 104	10 24 +34 11	7.2, 7.3	208″
SEX	h 2530	10 24 +02 22	6.4, 6.7	202″ P.A. = 65
SEX	β 1280	10 26 +03 56	6.7, 9.4	116″
SEX	O Σ 218	10 28 +03 34	7.4, 8.9	0.5″
LMI	O ΣΣ 105	10 30 +28 35	7.3, 8.3	130″
δ ANT	H N 50	10 30 −30 36	5.6, 9.8	11″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
36 UMA	LDS 2863	10 31 +55 59	4.8, 8.7	120″
SEX	Σ 1441	10 31 −07 38	6.5, 8.8	2.8″
VEL	Δ 86	10 31 −42 14	7.5, 8.1, 10.2	83,″ 42″
VEL	h 4329	10 31 −53 43	5.0, 8.6	74″
VEL	h 4327	10 31 −54 29	7.8, 8.6	114″
CAR	Δ 87	10 31 −61 21	6.6, 7.6	82″
VEL	Pz 3	10 32 −45 04	5.6, 6.0	14″
CHA	h 5444	10 32 −81 55	7.0, 9.1	41″
VEL	h 4330	10 33 −47 00	5.2, 8.6	40″
VEL	Δ 89	10 33 −55 23	6.8, 7.8, 8.1	25,″ 1.4″
LEO	Σ 1447	10 34 +23 21	7.5, 8.9	4″
LEO	Σ 1448	10 34 +21 36	7.5, 9.6	11″
VEL	h 4332	10 34 −46 59	7.1, 9.8	28″
49 LEO	Σ 1450	10 35 +08 39	5.8, 7.9	2.1″
CAR	CorO 107	10 35 −57 41	7.0, 9.9	5″
CAR	Δ 93/I 74	10 35 −64 08	7.5, 8.4/9.7	24″/2.7″
HYA	Kui 51	10 36 −12 14	5.4, 10.5	14″
HYA	β 411	10 36 −26 40	6.7, 7.8	1.3″
SEX	A 556	10 37 −08 50	7.1, 10.3	1.3″
x VEL	Δ 95	10 39 −55 36	4.4, 6.1	52″
CAR	Gli 152	10 39 −58 49	6.2, 8.0	26″
CAR	Δ 94	10 39 −59 11	4.9, 7.5	14″
CAR	R 152	10 39 −64 30	7.2, 9.0	2.1″
UMA	Σ 1462	10 43 +50 48	7.4, 9.3, 9.5	8,″ 194″
35 SEX	Σ 1466	10 43 +04 45	6.2, 7.1	7″
CAR	Δ 97	10 43 −61 10	6.6, 7.9	12″
CAR	h 4356	10 44 −59 33	7.3, 8.8	2.8″ In DN NGC 3372
CAR	Δ 99	10 44 −70 52	6.3, 6.5, 9.6	63,″ 42″
δ-1 CHA	I 294	10 45 −80 28	6.2, 6.5	0.8″
42 LMI	S 612	10 46 +30 41	5.3, 7.8	196″
μ VEL	R 155	10 47 −49 25	2.8, 5.7	2.0″
UMA	O Σ 229	10 48 +41 07	7.6, 7.9	0.7″
HYA	Σ 1474	10 48 −15 16	6.7, 7.1, 7.5	66,″ 7″
40 SEX	Σ 1476	10 49 −04 01	7.1, 7.8	2.4″
CAR	R 161	10 49 −59 19	6.1, 7.4	1.0″
CAR	h 4378	10 51 −59 57	7.1, 10.4	31″
LEO	S 617	10 53 −02 15	6.3, 8.7	35″
HYA	Ho 533	10 54 −20 08	5.2, 10.3	14″
υ CAR	Δ 102/Δ 103	10 54 −58 51	3.9, 6.2/7.8	159″/56″
CAR	h 4383	10 54 −70 43	6.4, 7.1	1.5″
ANT	h 4381	10 55 −38 45	7.0, 8.5	26″
54 LEO	Σ 1487	10 56 +24 45	4.5, 6.3	6″
CAR	h 4393	10 57 −69 02	6.6, 8.7	9″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
HYA	I 211	10 59 −33 44	5.8, 8.8	1.9″
CAR	R 164	10 59 −61 19	6.2, 9.7	3″
CHA	I 212	10 59 −81 33	7.4, 7.5	0.7″
UMA	Σ 1495	11 00 +58 54	7.3, 8.8	34″
LEO	Σ 1500	11 00 −03 28	7.5, 9.1	1.5″
α UMA	β 1077	11 04 +61 45	2.0, 4.8, 7.0	0.7,″ 381″ P.A. = 204
UMA	h 2554	11 04 +44 20	7.4, 9.3	40″
65 LEO	β 599	11 07 +01 57	5.6, 9.7	2.7″
CEN	h 4409	11 07 −42 38	5.3, 7.8	1.4″
UMA	β pm	11 12 +42 50	7.3, 8.8	135″
UMA	O ΣΣ 108	11 12 +35 50	6.3, 7.9	139″
CEN	R 165	11 13 −47 03	7.5, 7.5	2.8″
UMA	Ho 50	11 14 +41 05	6.4, 9.4	3″
δ LEO	β 1282	11 14 +20 31	2.6, 8.6	204″
LEO	Σ 1517	11 14 +20 08	7.5, 8.0	0.6″
UMA	Σ 1520	1116 +52 46	6.5, 7.8	12″
CEN	h 4423	11 16 −45 53	7.0, 7.3	2.5″
ϕ LEO	Sh 121	11 17 −03 39	4.5, 9.2	97″
CRT	β 600	11 17 −07 08	6.2, 8.2	54″
ν UMA	Σ 1524	11 18 +33 06	3.5, 10.1	7″
ξ UMA	Σ 1523	11 18 +31 32	4.3, 4.8	1.7″
CAR	R 163	11 18 −59 06	7.2, 7.6	1.6″
UMA	O Σ 233	11 19 +66 41	7.2, 10.1	5″
LEO	Σ 1527	11 19 +14 16	7.0, 8.1	1.7″
LEO	Σ 1529	11 19 −01 39	7.1, 7.9	9″
CEN	h 4426	11 22 −43 33	7.2, 10.5	13″
MUS	h 4432	11 23 −64 57	5.4, 6.6	2.4″
ι LEO	Σ 1536	11 24 +10 32	4.1, 6.7	1.7″
γ CRT	h 840	11 25 −17 41	4.1, 7.9	5″
81 LEO	h 4433	11 26 +16 27	5.6, 10.2	55″
83 LEO	Σ 1540	11 27 +03 01	6.6, 7.5, 9.9	29,″ 90″
UMA	Σ 1542	11 28 +44 34	6.9, 10.4	3″
τ LEO	Σ I 19	11 28 +02 51	5.1, 7.5	89″
57 UMA	Σ 1543	11 29 +39 20	5.3, 8.3	5″
CEN	BrsO 6	11 29 −42 40	5.1, 7.4	13″
CRT	Jc 16	11 30 −24 28	5.8, 8.6	8″
UMA	Σ 1544	11 31 +59 42	7.3, 8.0	12″
UMA	O Σ 235	11 32 +61 05	5.7, 7.6	0.7″
88 LEO	Σ 1547	11 32 +14 22	6.3, 9.1	15″
N HYA	H III 96	11 32 −29 16	5.6, 5.7	9″
CEN	I 78	11 34 −40 35	6.1, 6.2	0.7″
90 LEO	Σ 1552	11 35 +16 48	6.3, 7.3, 9.8	3,″ 67″
LEO	Σ 1555/h 503	11 36 +27 47	6.5, 6.8/10.2	0.7″/21″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
HYA	h 4455	11 37 −33 34	6.0, 7.8	3″
CEN	Δ 113	11 37 −38 58	6.9, 7.3	146″
VIR	Σ 1560	11 38 −02 26	6.4, 9.4	5″
UMA	Σ 1559	11 39 +64 21	6.8, 8.0	1.8″
UMA	Σ 1561	11 39 +45 07	6.5, 8.2, 8.5	9,″ 85″
CEN	h 4460	11 39 −57 44	7.2, 8.2	9″
LEO	Σ 1565	11 40 +19 00	7.3, 8.4	22″
HYA	I 232	11 40 −33 27	6.9, 9.4	2.1″
CEN	Δ 114	11 40 −38 06	6.7, 8.0	17″
CEN	BrsO 7	11 40 −63 29	7.7, 8.4	28″
CEN	HdO 212	11 41 −61 08	7.5, 7.9	1.0″
CEN	CapO 11	11 41 −62 34	6.9, 7.4	2.6″
62 UMA	β pm	11 42 +31 45	5.7, 10.0	84″
HYA	h 4465	11 42 −32 30	5.4, 8.3	66″
93 LEO	Σ II 7	11 48 +20 13	4.6, 9.0	74″
CRT	H VI 115	11 48 −10 19	6.3, 9.2	90″
DRA	Σ 1573	11 49 +67 20	7.5, 8.3	11″
β LEO	–	11 49 +14 34	2.1, 8.5 + 5.9	264″ + 19′ P.A. = 200 Denebola
VIR	Σ 1575	11 52 +08 50	7.4, 7.9	30″
CEN	Gli 169	11 52 −64 36	7.5, 9.0	4″
MUS	CorO 130	11 52 −65 12	5.0, 7.3	1.6″
LEO	Sh 132	11 53 +15 26	6.9, 10.2	39″
β HYA	h 4478	11 53 −33 54	4.7, 5.5	0.7″
CEN	Howe 71	11 54 −37 45	6.8, 8.1	1.3″
65 UMA	Σ 1579	11 55 +46 29	6.7, 8.3, 7.0	4,″ 63″
CEN	Hld 114	11 55 −56 06	7.4, 7.8	3″
UMA	O Σ 241	11 56 +35 27	6.8, 8.7	1.7″
CEN	h 4484	11 58 −40 57	7.0, 9.7	3″
ε CHA	h 4486	12 00 −78 13	5.3, 6.1	0.5″
DRA	Σ 1590	12 02 +70 41	7.5, 10.5	5″
67 UMA	Forgeron (no #)	12 02 +43 03	5.2, 6.7	278″ P.A. = 62
HYA	I 215	12 02 −34 39	7.4, 8.1	0.6″
OCT	h 4490	12 02 −85 38	6.2, 9.0	25″
ζ = 2COM	Σ 1596	12 04 +21 28	6.2, 7.5	4″
89 CEN	See 143	12 04 −39 01	7.1, 7.7	0.8″
CRU	Δ 117	12 05 −62 00	7.4, 7.8, 10.0	23,″ 25″
DRA	O Σ 244	12 06 +68 48	7.4, 9.2, 7.8	10,″ 127,″ 127″
UMA	Σ 1600	12 06 +51 56	7.6, 8.3	8″
VIR	h 198	12 06 −05 51	6.9, 10.2	80″
HYA	h 4495	12 06 −32 58	6.7, 8.8	6″
MUS	h 4498	12 06 −65 43	6.1, 7.7	9″
CEN	h 4500	12 07 −37 52	6.7, 9.0	50″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
δ CEN	Jc 2	12 08 −50 43	2.5, 4.4, 6.3	269,″ 217″ P.A. = 325, 227
CRV	Σ 1604	12 10 −11 51	6.6, 9.4, 8.1	9,″ 10″
HYA	Jc 17	12 10 −34 42	6.4, 8.0	3″
CAM	Sh 136	12 11 +81 43	6.2, 8.3	71″
CVN	Σ 1606	12 11 +39 53	7.3, 8.0	0.5″
CRV	S 634	12 11 −16 47	7.2, 8.8	5″
VIR	Σ 1616	12 14 +08 47	7.5, 9.7	23″
COM	Σ 1615	12 14 +32 47	7.0, 8.6	27″
HYA	Howe 72	12 14 −33 48	6.5, 8.3	1.4″
D CEN	Rmk 14	12 14 −45 43	5.8, 7.0	3″
CAM	Σ 1625	12 16 +80 08	7.2, 7.8	15″
2 CVN	Σ 1622	12 16 +40 40	5.9, 8.7	11″
CRV	β 920	12 16 −23 21	6.9, 8.2	1.8″
CVN	Σ 1624	12 17 +39 36	7.2, 10.1	6″
COM	O Σ 245	12 18 +28 56	5.7, 10.2	8″
VIR	Σ 1627	12 18 −03 57	6.6, 6.9	20″
CEN	R 193	12 18 −36 06	6.8, 7.1	0.6″
CVN	Σ 1632	12 20 +37 54	6.8, 10.0	10″
COM	Σ 1633	12 21 +27 03	7.0, 7.1	9″
UMA	Wnc 4	12 22 +58 05	9.0, 9.3	50″ = M40
17 VIR	Σ 1636	12 22 +05 18	6.6, 10.5	20″
12 COM	Sh 143	12 22 +25 51	4.9, 8.9	65″
COM	Σ 1639	12 24 +25 35	6.7, 7.8	1.7″
CEN	h 4518	12 25 −41 23	6.5, 8.4	10″
CRU	BrsO 8	12 25 −58 07	7.6, 7.9	5″
α CRU	–	12 27 −63 06	1.3, 1.6, 4.8	4,″ 90″ Acrux
CVN	Σ 1645	12 28 +44 48	7.5, 8.1	10″
17 COM	Σ I 21	12 29 +25 55	5.2, 6.6	146″ In Coma Star Cluster
δ CRV	Sh 145	12 30 −16 31	3.0, 8.5	25″
VIR	Σ 1648	12 31 +03 31	7.5, 9.8	8″
γ CRU	Δ 124	12 31 −57 07	1.6, 6.5, 9.5	127,″ 155″
DRA	Σ 1654	12 32 +74 49	7.6, 9.1	4″
24 COM	Σ 1657	12 35 +18 23	5.1, 6.3	20″
VIR	Σ 1664	12 38 −11 31	7.8, 9.2, 11.6, 11.6	37,″ 66,″ 31″ (Forms arrow pointing directly at Sombrero Galaxy/M104)
VIR	S 639	12 39 −04 22	6.8, 10.0	56″
MUS	I 296	12 39 −75 22	6.7, 8.7	1.7″
CRV	Σ 1669	12 41 −13 01	5.9, 5.9	5″
γ VIR	Σ 1670	12 42 −01 27	3.5, 3.5	1.0″ Porrima
γ CEN	h 4539	12 42 −48 58	2.8, 2.9	0.9″
CRU	h 4543	12 44 −58 54	6.5, 9.8	37″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
COM	Σ 1678	12 45 +14 22	7.2, 7.7	37″
VIR	Σ 1677	12 45 −03 53	7.3, 8.1	16″
CRU	h 4548	12 46 −56 29	5.0, 8.9	52″
ι CRU	h 4547	12 46 −60 59	4.7, 9.5	27″
β MUS	R 207	12 46 −68 06	3.5, 4.0	1.1″
β CRU	Δ 125	12 48 −59 41	1.3, 7.2	373″ P.A. = 23 Mimosa
32 CAM	Σ 1694	12 49 +83 25	5.3, 5.7	22″
MUS	Gli 185	12 49 −65 36	7.3, 9.7	9″
VIR	Σ 1682	12 51 −10 20	6.6, 9.7	29″
COM	Σ 1685	12 52 +19 10	7.3, 7.8	16″
32/33 COM	Σ I 23	12 52 +17 04	6.5, 7.0	196″ P.A. = 51
35 COM	Σ 1687	12 53 +21 14	5.1, 7.1, 9.8	1.2,″ 28″
CAM	O Σ 258	12 54 +82 31	7.3, 10.5	10″
CRV	S 643	12 54 −18 02	7.1, 8.2	24″
HYA	h 4556	12 54 −27 58	7.4, 8.9	6″
μ CRU	Δ 126	12 55 −57 11	3.9, 5.0	35″
ι OCT	Rst 2819	12 55 −85 07	5.9, 6.9	0.7″
UMA	Σ 1695	12 56 +54 06	6.0, 7.8	4″
α CVN	Σ 1692	12 56 +38 19	2.9, 5.5	19″ Cor Caroli
VIR	Σ 1689	12 56 +11 30	7.1, 9.1	30″
VIR	O Σ 256	12 56 −00 57	7.2, 7.6	0.9″
VIR	Σ 1690	12 56 −04 52	7.2, 9.0	6″
CRU	HdO 221	12 56 −56 50	5.3, 10.3	30″
CEN	I 83	12 57 −47 41	7.4, 7.7	0.8″
CEN	CorO 143	12 58 −54 11	7.4, 8.7	16″
VIR	Σ 1701	12 59 +06 30	7.5, 9.5	22″
CEN	CapO 13	13 00 −48 36	7.2, 9.2	5″
78 UMA	β 1082	13 01 +56 22	5.0, 7.9	1.2″
46 VIR	AGC 5	13 01 −03 22	6.2, 8.8	0.8″
CEN	h 4563	13 01 −33 37	7.0, 8.2	6″
48 VIR	β 929	13 04 −03 40	7.1, 7.7	0.6″
VIR	β 341	13 04 −20 35	6.3, 6.5	0.8″
UMI	β 799	13 05 +73 02	6.5, 8.5	1.2″
CVN	h 2639	13 06 +40 55	7.5, 10.5, 9.5	31,″ 57″
VIR	Σ 1719	13 07 +00 35	7.6, 8.2	7″
ξ-2 CEN	Δ 128	13 07 −49 54	4.2, 10.1	25″
CEN	R 213	13 07 −59 52	7.0, 7.0	0.7″
CVN	Σ 1723	13 08 +38 44	7.3, 8.6	7″
CEN	h 4569	13 08 −56 41	7.5, 9.1	5″
θ MUS	Rmk 16	13 08 −65 18	5.7, 7.6	5″
15/17 CVN	Σ I 24	13 10 +38 30	6.0, 6.3	278″
α COM	Σ 1728	13 10 +17 32	4.9, 5.5	0.5″
θ VIR	Σ 1724/H III 50	13 10 −05 32	4.4, 9.4/10.4	7″/70″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
CVN	O Σ 261	13 12 +32 05	7.4, 7.6	2.6″
CEN	h 4571	13 12 −35 08	6.8, 9.1	24″
CEN	I 424	13 12 −59 55	4.8, 8.4	1.9″
54 VIR	Sh 151	13 13 −18 50	6.8, 7.2	5″
CEN	CorO 152	13 13 −59 49	6.3, 9.4	25″
DRA	Σ I 25	13 14 +67 17	6.6, 7.1, 9.2	179,″ 114″ P.A. = 295
UMA	O ΣΣ 122	13 14 +56 42	6.8, 8.7	118″
VIR	Rst 3829/Sh 162	13 15 −11 22	7.2, 9.1/8.2	0.6″/108″
η MUS	Δ 131	13 15 −67 54	4.8, 7.2	58″
COM	β 800	13 17 +17 01	6.7, 9.5	8″
CEN	I 233	13 17 −41 17	7.3, 10.3	3″
VIR	Σ 1734	13 21 +02 57	6.8, 7.5	1.0″
CEN	Slr 18	13 23 −47 57	6.9, 7.2	0.6″
J CEN	Δ 133	13 23 −60 59	4.5, 6.2	61″
ζ/80 UMA	Σ 1744	13 24 +54 56	2.2, 3.9/4.0	14,″ 708″ P.A. = 70 Mizar/Alcor
VIR	Σ 1740	13 24 +02 43	7.1, 7.4	26″
VIR	β 610	13 24 −20 55	6.6, 10.1	4″
DRA	O ΣΣ 123	13 27 +64 44	6.6, 7.0	69″
70 VIR	β pm	13 28 +13 47	5.0, 8.7	269″
VIR	Σ 1746	13 28 +09 28	7.6, 9.8	23″
MUS	h 4586	13 28 −67 52	7.3, 9.1	2.9″
VIR	Σ 1751	13 31 +09 19	7.1, 10.3	6″
CEN	See 180	13 31 −42 28	6.8, 9.2	4″
CVN	Σ 1755	13 32 +36 49	7.3, 8.1	4″
CEN	Hrg 86	13 32 −62 21	7.2, 7.6	1.6″
CEN	Δ 137	13 32 −63 03	7.5, 8.5	16″
MUS	I 298	13 32 −69 14	7.2, 8.8	0.9″
VIR	β 932	13 35 −13 13	6.3, 7.3	0.5″
VIR	h 228	13 36 +10 12	6.6, 9.0	70″
HYA	H N 69	13 37 −26 30	5.7, 6.6	10″
UMA	Σ 1770	13 38 +50 43	6.9, 8.2	1.7″
25 CVN	Σ 1768	13 38 +36 18	5.0, 7.0	1.8″
VIR	Σ 1764	13 38 +02 23	6.8, 8.6	16″
CEN	See 184	13 38 −35 04	7.5, 9.6	2.8″
CEN	R 223	13 38 −58 25	6.6, 9.9	2.6″
UMA	Σ 1774	13 40 +50 31	6.4, 9.7	18″
UMI	h 2682	13 41 +76 51	6.7, 10.3, 9.0	26,″ 44″
CVN	β pm	13 41 +28 04	6.3, 9.6	90″
1 BOO	Σ 1772	13 41 +19 57	5.8, 9.6	4″
HYA	h 4606	13 42 −23 27	6.6, 10.2	31″
CEN	h 4608	13 42 −33 59	7.4, 7.5	4″
Q CEN	Δ 141	13 42 −54 34	5.2, 6.5	6″
84 VIR	Σ 1777	13 43 +03 32	5.6, 8.3	2.8″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
VIR	Σ 1775	13 43 −04 16	7.2, 10.1	28″
CEN	Howe 95	13 44 −40 11	7.5, 7.9	1.1″
CEN	Δ 142	13 44 −59 14	6.5, 7.6	33″
CVN	S 654	13 47 +38 33	5.6, 8.9	70″
CEN	CorO 157	13 47 −62 35	7.2, 9.9	7″
BOO	Σ 1785	13 49 +26 59	7.4, 8.2	4″
CEN	Howe 94	13 49 −35 42	6.6, 10.2	12″
CEN	Δ 146	13 49 −40 31	7.0, 7.5	66″
CEN	Δ 143	13 49 −62 06	7.6, 8.1	12″
BOO	S 656	13 50 +21 17	6.9, 7.4	86″
DRA	O ΣΣ 127	13 51 +68 19	6.4, 8.2	80″
CEN	β 343	13 52 −31 37	6.5, 7.5	0.7″
3 CEN	H III 101	13 52 −33 00	4.5, 6.0	8″
CEN	h 4619	13 52 −47 52	7.0, 8.4	23″
CEN	CapO 61	13 52 −48 18	7.4, 7.4	30″
CEN	Rmk 18	13 52 −52 49	5.2, 7.5	18″
4 CEN	H N 51	13 53 −31 56	4.7, 8.5	15″
y CEN	Howe 28/H V 124	13 53 −35 40	6.3, 6.4/8.7	1.0″/68″
η BOO	Sh 169	13 55 +18 24	2.7, 9.7	111″
VIR	Σ 1788	13 55 −08 04	6.5, 7.3	4″
CEN	Howe 74	13 55 −32 06	7.1, 9.6	6″
CEN	R 227	13 56 −54 08	6.5, 7.5	2.0″
CEN	Δ 151	13 57 −56 02	7.6, 9.4	30″
CIR	h 4632	13 58 −65 48	6.4, 9.5	6″
UMA	Σ 1795	13 59 +53 06	6.9, 9.8	8″
BOO	Σ 1793	13 59 +25 49	7.5, 8.4	5″
τ VIR	Sh 171	14 02 +01 33	4.3, 9.5	81″
CEN	β 1197	14 04 −31 41	6.5, 7.8	2.5″
β CEN	Vou 31	14 04 −60 22	0.6, 4.0	0.9″ Hadar
BOO	Bgh (no #)	14 05 +25 49	7.0, 8.9	96″
CVN	O Σ 274	14 07 +34 47	7.2, 10.2	13″
CEN	h 4642	14 07 −63 27	6.7, 10.2	26″
13 BOO	H VI 112	14 08 +49 27	5.3, 9.8	80″
CEN	Slr 19	14 08 −49 52	7.1, 7.4	1.3″
CEN	Δ 155	14 08 −53 41	7.6, 8.6	18″
CEN	h 4651	14 10 −51 30	6.2, 9.2	64″
κ BOO	Σ 1821	14 14 +51 47	4.5, 6.6	14″
BOO	Σ 1816	14 14 +29 06	7.4, 7.8	0.6″
15 BOO	Kui 66	14 15 +10 06	5.4, 8.0	1.0″
CEN	CorO 167	14 15 −61 42	6.6, 8.4	2.8″
UMA	Σ 1831	14 16 +56 43	7.2, 9.6, 6.7	6,″ 110″
ι BOO	Σ I 26	14 16 +51 22	4.8, 7.4	39″
BOO	Σ 1825	14 16 +20 07	6.5, 8.4	4″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
UMI	Σ 1840	14 20 +67 47	6.8, 9.5	27″
LUP	h 4672	14 20 −43 04	5.8, 7.9	4″
CEN	I 1241/CorO 168	14 21 −42 25	7.2, 8.9/9.0	79″/1.7″
BOO	Σ 1835	14 23 +08 27	5.0, 6.8	6″
VIR	Σ 1833	14 23 −07 46	7.5, 7.5	6″
LUP	R 244	14 23 −48 19	6.1, 9.5	4″
CEN	Δ 159	14 23 −58 28	5.0, 7.6	9″
BOO	Σ 1838	14 24 +11 15	7.5, 7.7	9″
LIB	Σ 1837	14 25 −11 40	6.9, 8.0	1.2″
LIB	h 546	14 25 −13 21	6.6, 10.0	40″
LIB	Sh 179/β 225	14 26 −19 58	6.6, 7.2/8.4	34″/1.2″
τ-1 LUP	Δ 160	14 26 −45 13	4.6, 9.3	158″
5 UMI	h 2733	14 28 +75 42	4.3, 9.9	59″
φ VIR	Σ 1846	14 28 −02 14	4.9, 9.7	5″
52 HYA	β 940	14 28 −29 29	5.0, 10.0	4″
BOO	Σ 1850	14 29 +28 17	7.1, 7.6	26″
BOO	Σ 1854	14 30 +31 47	6.1, 9.6	26″
VIR	Σ 1852	14 30 −04 15	7.1, 10.2	25″
APS	I 326	14 32 −76 16	7.0, 10.3	2.3″
UMI	Σ 1915	14 33 +85 56	7.1, 10.1	2.5″
CEN	β 1112	14 33 −30 43	6.2, 9.5	2.5″
LUP	h 4690	14 37 −46 08	5.6, 7.7	19″
BOO	Σ 1863	14 38 +51 35	7.4, 7.7	0.6″
CIR	WFC 153	14 38 −67 56	6.1, 9.9	34″
α CEN	Richaud (no #)	14 40 −60 50	0.1, 1.2	13″ Rigil Kent
DRA	Σ 1872	14 41 +57 57	7.5, 8.3	8″
π BOO	Σ 1864	14 41 +16 25	4.9, 5.8	6″
ζ BOO	Σ 1865	14 41 +13 44	4.5, 4.6	0.7″
DRA	Σ 1878	14 42 +61 16	6.3, 9.2	4″
CEN	β 414	14 42 −30 56	6.9, 7.8	1.0″
α CIR	Δ 166	14 42 −64 59	3.2, 8.5	16″
DRA	Σ 1882	14 44 +61 06	6.9, 9.2	12″
ε BOO	Σ 1877	14 45 +27 04	2.6, 4.8	2.9″ Izar
CIR	Δ 169	14 45 −55 36	6.1, 7.6	69″
5 LIB	Hld 20	14 46 −15 28	6.4, 10.1	3″
54 HYA	H III 97	14 46 −25 27	5.1, 7.3	8″
VIR	Σ 1881	14 47 +00 58	6.7, 8.8	4″
BOO	Σ 1884	14 48 +24 22	6.6, 7.5	2.1″
LIB	β 346	14 48 −17 20	7.5, 7.9	2.5″
CEN	h 4702	14 48 −35 51	6.9, 9.4	10″
VIR	Σ 1883	14 49 +05 57	7.0, 8.0	0.9″
μ LIB	β 106	14 49 −14 09	5.6, 6.6	1.9″
LIB	H VI 117	14 49 −24 15	5.8, 8.6	64″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
CIR	h 4699	14 49 −59 24	7.0, 10.0	37″
CIR	I 369	14 49 −66 36	5.9, 9.0	47″
BOO	Σ 1889	14 50 +51 22	6.5, 9.6	15″
39 BOO	Σ 1890	14 50 +48 43	6.3, 6.7	2.7″
ξ BOO	Σ 1888	14 51 +19 06	4.8, 7.0	6″
α LIB	Sh 186	14 51 −16 02	2.7, 5.2	231″ P.A. = 315
BOO	O Σ 288	14 53 +15 42	6.9, 7.6	1.1″
LUP	Δ 171	14 53 −45 51	7.1, 9.6	18″
APS	I 236	14 53 −73 11	5.9, 7.6	2.2″
CIR	h 4707	14 54 −66 25	7.5, 8.1	0.8″
BOO	O Σ 289	14 56 +32 18	6.2, 10.2	5″
33 LIB	H N 28	14 57 −21 25	5.9, 8.2	25″
LUP	h 4715	14 56 −47 53	6.0, 6.8	2.2″
VIR	H V 51	14 58 −00 10	5.6, 8.5	86″
CEN	h 4718	14 58 −35 23	7.4, 8.7	1.8″
LUP	CapO 62	14 58 −47 26	7.4, 8.4	24″
18 LIB	Σ 1894	14 59 −11 09	5.9, 9.9	20″
59 HYA	β 239	14 59 −27 39	6.2, 6.8	0.6″
BOO	Sh 191	15 00 +53 52	6.8, 7.4	40″
CEN	h 4722	15 00 −30 43	7.1, 9.3	8″
BOO	O Σ 291	15 01 +47 17	6.3, 9.6	36″
CIR	Gli 213	15 01 −67 59	7.1, 9.3	5″
VIR	β 348	15 02 −00 08	6.1, 7.5	0.5″
LIB	Σ 1899	15 02 −03 10	6.7, 10.2	29″
LUP	h 4723	15 02 −51 55	7.1, 10.5	6″
44 BOO	Σ 1909	15 04 +47 39	5.2, 5.8–6.4	1.9″
VIR	Σ 1904	15 04 +05 30	7.2, 7.4	10″
LUP	HdO 242	15 05 −41 04	5.3, 9.0	30″
π LUP	h 4728	15 05 −47 03	4.6, 4.6	1.6″
APS	CapO 15	15 06 −72 10	7.2, 8.5	1.4″
BOO	Σ 1910	15 08 +09 14	7.4, 7.5	4″
BOO	h 2766	15 09 +25 07	5.8, 9.9	58″
LUP	CapO 415	15 11 −43 44	7.1, 7.7	50″
ι LIB	H IV 44	15 12 −19 47	5.1, 10.0	57″
LUP	Δ 178	15 12 −45 17	6.5, 7.3	31″
κ LUP	Δ177	15 12 − 48 44	3.8, 5.5	26″
ζ LUP	Δ 176	15 12 −52 06	3.5, 6.7	72″
SER	Σ 1919	15 13 +19 17	6.7, 7.4	23″
BOO	O Σ 292	15 14 +31 47	6.2, 9.4	119″
LIB	Sh 195	15 14 −18 26	6.8, 8.3	47″
LUP	B 1274	15 14 −38 30	7.7, 8.3	0.6″
LUP	Δ 179	15 14 −43 23	7.3, 8.5	10″
CIR	I 329	15 14 −61 21	6.7, 7.7	0.9″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
LUP	HdO 244	15 15 −44 09	6.7, 9.6	14″
BOO	O ΣΣ 137	15 16 +50 56	6.6, 8.9	68″
δ BOO	Σ I 27	15 16 +33 19	3.6, 7.9	104″
LUP	h 4750	15 16 −48 04	6.0, 10.2	13″
CRB	Σ 1932	15 18 +26 50	7.3, 7.4	1.6″
μ LUP	h 4753/Δ 180	15 18 −47 53	4.9, 5.0/6.3	1.0″/22″
SER	Σ 1931	15 19 +10 26	7.2, 8.1	13″
5 SER	Σ 1930	15 19 +01 46	5.1, 10.1	11″ Near GC M5
LIB	β 227	15 19 −24 16	7.5, 8.6	1.8″
DRA	O Σ 138	15 20 +60 23	7.5, 7.7, 9.3	150,″ 82″
6 SER	β 32	15 21 +00 43	5.5, 8.8	3″
ο LIB	β (no #)	15 21 −15 33	6.2, 8.4	44″
TRA	I 332	15 21 −67 29	6.4, 8.2	1.1″
CRB	h 2777	15 22 +25 37	7.3, 10.2	41″
LUP	Howe 76	15 22 −38 13	6.6, 9.3	6″
η CRB	Σ 1937	15 23 +30 17	5.6, 6.0	0.5″
ε LUP	Copeland (no #)/Δ 182	15 23 −44 41	3.6, 5.2/9.1	0.5″/26″
γ CIR	h 4757	15 23 −59 19	5.0, 5.7	0.8″
μ BOO	Σ I 28/Σ 1938	15 24 +37 23	4.3, 7.1/7.6	107″/2.2″
ι DRA	β pm	15 25 +58 58	3.4, 8.9	255″
k LUP	Δ 183	15 25 −38 44	4.7, 9.3	148″
LIB	Sh 202	15 28 −09 21	6.8, 8.1	52″
π-1 UMI	Σ 1972	15 29 +80 27	6.6, 7.3	32″
LIB	β 1114/h 4774	15 29 −28 52	7.0, 7.8/9.6	0.8″/10″
LUP	h 4776	15 30 −41 55	6.3, 8.4	6″
CIR	CapO 16	15 30 −58 21	7.0, 8.0	2.4″
ν-1/2 BOO	–	15 31 +40 50	5.0, 5.0	900″
LIB	S 672	15 32 −20 10	6.3, 8.9	11″
LIB	Lal 123	15 33 −24 29	6.9, 7.0	9″
NOR	h 4777	15 33 −57 24	7.5, 9.1	6″
LUP	Δ 187	15 34 −47 32	7.1, 10.0	28″
δ SER	Σ 1954	15 35 +10 32	4.2, 5.2	4″
γ LUP	h 4786	15 35 −41 10	3.0, 4.5	0.8″
d LUP	h 4788	15 36 −44 57	4.7, 6.5	2.1″
BOO	OΣ 298	15 36 +39 48	7.2, 8.4, 7.8	0.8,″ 122″
ε TRA	Δ 188	15 37 −66 19	4.1, 9.5	83″
CRB	Σ 1964	15 38 +36 15	7.0, 7.6, 8.7	15,″ 16″
ζ CRB	Σ 1965	15 39 +36 38	5.0, 5.9	6″
LIB	Σ 1962	15 39 −08 47	6.4, 6.5	12″
SER	O Σ 300	15 40 +12 03	6.3, 10.1	15″
LIB	β 122	15 40 −19 46	7.6, 7.8	1.7″
LUP	I 89	15 41 −39 59	7.0, 7.9	1.2″
LUP	Arg 28	15 42 −30 09	7.6, 9.2, 9.9	35,″ 89″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
SER	β 619	15 43 +13 40	6.9, 7.4	0.5″
γ CRB	Σ 1967	15 43 +26 18	4.0, 5.6	0.7″
LIB	β 35	15 43 −16 01	7.3, 8.7	1.8″
LIB	β 354	15 43 −25 25	7.3, 9.3	6″
NOR	Δ 190	15 43 −58 07	7.4, 9.7	6″
ψ SER	A 2230	15 44 +02 31	6.0, 9.2	196″
LUP	Howe 79	15 44 −41 49	6.1, 7.9	3″
NOR	Hld 124	15 45 −50 47	6.6, 8.5	2.2″
β SER	Σ 1970	15 46 +15 25	3.7, 10.0	31″
LIB	β 620/h 4803	15 46 −28 04	7.0, 7.6/9.0	0.6″/7″
LUP	Δ 192	15 47 −35 31	6.9, 7.3	35″
DRA	β 946	15 48 +55 23	5.9, 9.5	2.2″
TRA	Rmk 20	15 48 −65 27	6.2, 6.4	1.8″
DRA	Σ 1984	15 51 +52 54	6.6, 8.9	6″
NOR	Δ 193	15 51 −55 03	5.8, 9.1	16″
2 SCO	β 36	15 54 −25 20	4.7, 7.0	2.1″
CRB	O Σ 302	15 55 +34 22	7.2, 9.2	29″
NOR	Δ 195	15 55 −50 20	6.8, 7.5	12″
TRA	Slr 11/Δ 194	15 55 −60 45	6.3, 8.1/10.0, 9.0	1.1″/44,″ 48″
SER	Σ 1985	15 56 −02 10	7.0, 8.7	6″
NOR	h 4813	15 56 −60 11	5.9, 8.4	4″
SER	Σ 1988	15 57 +12 29	7.5, 7.8	1.9″
SER	Σ 1987	15 57 +03 24	7.3, 8.7	11″
ξ LUP	Δ 196	15 57 −33 58	5.1, 5.6	10″
η LUP	Rmk 21	16 00 −38 24	3.4, 7.5, 9.3	15,″ 115″
ρ CRB	S 676	16 01 +33 18	5.5, 8.7	90″
SER	O Σ 303	16 01 +13 16	7.5, 8.0	1.2″
LUP	CorO 190	16 01 −40 26	6.1, 10.1	8″
SCO	β 38	16 03 −25 01	7.2, 9.5	4″
ι-1 NOR	See 258/h 4825	16 04 −57 47	5.2, 5.8/8.0	0.5″/11″
ξ SCO	Σ 1998	16 04 −11 22	4.9, 5.1, 73	0.7,″ 8″
SCO	Σ 1999	16 04 −11 27	7.5, 8.1	12″ In field with ξ SCO
UMI	O ΣΣ 143	16 05 +70 16	6.7, 9.3	47″
β SCO	H III 7	16 05 −19 48	2.6, 4.5	14″ Graffias
SER	Σ 2007	16 06 +13 19	6.9, 8.0	38″
OPH	β 948/Σ 2005	16 06 −06 17	6.4, 9.1/9.9	1.0″/29″
ω-1/2 SCO	–	16 07 −20 40	4.0, 4.3	720″
κ HER	Σ 2010	16 08 +17 03	5.1, 6.2	27″
11 SCO	β 39	16 08 −12 45	5.6, 9.9	3″
SCO	Δ 199	16 09 −39 06	6.6, 7.1	44″
SCO	BrsO 11	16 10 −32 39	6.7, 7.2	8″
CRB	O Σ 305	16 12 +33 21	6.4, 10.2	6″
ν SCO	β 120/Mitchel (no #)	16 12 −19 28	4.4, 5.3/6.6, 7.2	1.3″/2.4″ Pairs 41″ apart = H V 6

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
HER	Σ 2024	16 12 +42 22	5.9, 9.6	24″
12 SCO	h 4839	16 12 −28 25	5.8, 8.1	4″
49 HER	Σ 2021	16 13 +13 32	7.4, 7.5	4″
SCO	Σ 2019	16 14 −10 25	7.4, 9.8	22″
σ CRB	Σ 2032	16 15 +33 52	5.6, 6.5	7″
SER	Σ 2031	16 16 −01 39	7.2, 8.7	20″
SCO	Sh 225	16 20 −20 03	7.4, 8.1	47″
SCO	Sh 226	16 20 −20 07	7.5, 8.3	13″
SCO	BrsO 12	16 20 −30 54	5.6, 6.9	24″
SCO	I 91	16 20 −39 26	6.1, 10.1	15″
γ-2 NOR	h 4841	16 20 −50 09	4.0, 10.0	45″
δ APS	BrsO (no #)	16 20 −78 42	4.9, 5.4	103″
σ SCO	H IV 121	16 21 −25 36	2.9, 8.4	20″
ν-1/2 CRB	Σ I 29	16 22 +33 48	5.4, 5.6	361″ P.A. = 165
γ HER	Sh 227	16 22 +19 09	3.8, 10.1	43″
SER	Σ 2041	16 22 +01 13	7.5, 10.5	2.6″
NOR	Δ 200	16 22 −43 55	5.9, 9.5	40″
CRB	H V 38	16 23 + 32 20	6.4, 9.8	32″
DRA	Σ 2054	16 24 +61 42	6.2, 7.1	1.0″ In field with η DRA
η DRA	O Σ 312	16 24 +61 31	2.8, 8.2	5″
SCO	h 4848	16 24 −33 12	6.9, 7.3, 9.0	6,″ 92″
SCO	H N 39	16 25 −29 42	5.9, 6.6	4″
ρ OPH	H II 19	16 26 −23 27	5.1, 5.7	2.9″
ε NOR	h 4853	16 27 −47 33	4.5, 6.1	23″
υ OPH	Rst 3949	16 29 −08 22	4.6, 7.8	1.0″
ι TRA	Δ 201	16 28 −64 03	5.3, 9.4	17″
HER	Σ 2052	16 29 +18 25	7.7, 7.8	2.0″
OPH	Σ 2048	16 29 −08 08	6.6, 9.7	6″
α SCO	Burg/Grant (no #s)	16 29 −26 26	0.9–1.8, 5.4	2.5″ Antares
λ OPH	Σ 2055	16 31 +01 59	4.2, 5.2	1.6″
HER	Σ 2063	16 32 +45 36	5.7, 8.7	16″
HER	Sh 233	16 32 +08 18	7.2, 9.1	59″
SCO	Δ 202	16 32 −41 49	5.5, 9.8	58″
HER	Webb (no #)	16 35 +17 03	6.3, 7.3	157″
17/16 DRA	Σ 2078/Σ I 30	16 36 +52 55	5.4, 6.4/5.5	3″/90″
SCO	h 4867	16 38 −43 24	5.8, 9.4	16″
HER	Σ 2079	16 40 +23 00	7.6, 8.1	17″
R ARA	–	16 40 −57 00	7.2, 7.8	3″
ζ HER	Σ 2084	16 41 +31 36	3.0, 5.4	0.9″
37 HER	Σ I 31	16 41 +04 13	5.8, 6.9	69″
ARA	Slr 21	16 41 −47 45	7.4, 9.4	1.7″
ARA	Δ 206/h 4876	16 41 −48 46	5.7, 6.8/10.4	10″/13″
ARA	B 1818	16 41 −60 27	6.3, 9.0	1.4″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
HER	Σ 2085	16 42 +21 36	7.4, 9.2	6″
SCO	R 283	16 42 −37 05	7.0, 7.8	0.5″
UMI	Ku 1 = Hu 917	16 43 +77 31	6.1, 9.4	2.9″
HER	O ΣΣ 149	16 44 +20 43	7.1, 8.5	99″
HER	Σ 2094	16 44 +23 31	7.5, 7.9	1.2″
OPH	Σ 2086	16 44 −00 33	7.5, 10.0	14″
HER	H V 127	16 44 +06 37	7.7, 9.1	54″
SCO	β 1116	16 44 −27 27	6.6, 10.2	2.0″
SCO	CapO 70	16 44 −41 07	6.1, 6.2	97″
46 HER	Σ 2095	16 45 +28 21	7.4, 9.2	5″
HER	Σ 2101	16 46 +35 38	7.4, 10.1	4″
43 HER	Sh 239	16 46 +08 35	5.2, 9.6	82″
OPH	β pm	16 47 +02 15	6.7, 9.1	150″
19 OPH	Σ 2096	16 47 +02 04	6.1, 9.7	24″
SCO	Δ 209	16 48 −36 53	7.5, 8.4	24″
ARA	Δ 211	16 48 −48 19	7.4, 8.1, 8.2	106,″ 45″
HER	Σ 2104	16 49 +35 56	7.5, 8.8	6″
OPH	Σ 2106	16 51 +09 24	7.1, 8.2	0.7″
21 OPH	O Σ 315	16 51 +01 13	5.7, 7.6	0.7″
SCO	h 4889	16 51 −37 31	6.2, 7.8	7″
ARA	CorO 201	16 51 −50 03	7.2, 7.3	3″
HER	Σ 2107	16 52 +28 40	6.9, 8.5	1.4″
SCO	See 293	16 54 −41 48	5.6, 7.3	57″ In OC NGC 6231
SCO	See 297	16 54 −41 50	6.1, 9.9	14″ In OC NGC 6231
SCO	WFC 183	16 54 −41 51	6.4, 7.7	30″ In OC NGC 6231
ζ-1/2 SCO	–	16 54 −42 22	3.6, 4.7	408″ P.A. = 90/270?
μ-1/2 SCO	–	16 52 −38 03	3.0, 3.6	347″ P.A. = 90/270?
OPH	β 241	16 56 −21 34	7.5, 7.7	0.5″
20 DRA	Σ 2118	16 56 +65 02	7.1, 7.3	1.0″
HER	O Σ 318	16 57 +14 08	7.0, 9.6	3″
OPH	Sh 240	16 57 −19 32	6.6, 7.6	5″
24 OPH	β 1117	16 57 −23 09	6.3, 6.3	1.0″
OPH	h 4902	16 58 −27 37	7.5, 10.3	11″
ARA	See 316	17 00 −48 39	6.3, 7.7	1.0″
30 OPH	β pm	17 01 −04 13	4.8, 9.6	95″
OPH	Σ 2114	17 02 +08 27	6.7, 7.6	1.3″
ARA	CorO 206	17 03 −50 10	7.3, 8.1	8″
HER	Σ I 33	17 04 +13 36	5.9, 6.2	305″ P.A. = 118
μ DRA	Σ 2130	17 05 +54 28	5.7, 5.7	2.3″
HER	Σ 2120	17 05 +28 05	7.4, 9.3	23″
OPH	Σ 2122	17 07 −01 39	6.4, 9.7	20″
SCO	CorO 208	17 07 −44 27	7.2, 9.3	5″
η OPH	β 1118	17 10 −15 43	3.1, 3.3	0.6″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
ARA	Δ 213	17 10 −46 44	7.0, 8.3	8″
APS	h 4904	17 10 −75 23	7.6, 9.1	7″
APS	h 4884	17 10 −82 19	7.2, 8.9	35″
HER	Σ 2142	17 12 +49 45	6.2, 9.4	5″
HER	Σ 2135	17 12 +21 14	7.4, 8.7	8″
DRA	Σ 2146	17 13 +54 08	7.2, 9.2, 9.2	2.8,″ 89″
ARA	h 4920	17 13 −58 36	7.0, 9.2	3″
ARA	Δ 214	17 13 −67 12	6.0, 8.8	37″
SCO	Howe 86	17 14 −38 18	6.9, 9.0	2.7″
SCO	h 4926	17 14 −39 46	6.7, 10.1	14″
δ HER	Σ 3127	17 15 +24 50	3.1, 8.3	11″
α HER	Σ 2140	17 15 +14 23	3.1–3.9, 5.4	5″ Rasalgethi
36 OPH	Sh 243	17 15 −26 36	5.1, 5.1, 6.7	5,″ 730″
SCO	I 408	17 16 −42 20	7.0, 9.0	1.7″
68 HER	O Σ 328	17 17 +33 06	4.8, 10.2	4″
41 OPH	A 2984	17 17 −00 27	4.9, 7.5	1.0″
ο OPH	H III 25	17 18 −24 17	5.2, 6.6	10″
38 OPH	H I 35	17 18 −26 38	6.9, 9.1	5″
SCO	MlbO 4/h4935	17 19 −34 59	6.4, 7.4/9.9	1.7″/31″
ARA	BrsO 13	17 19 −46 38	5.6, 8.9	9″
OPH	β 126	17 20 −17 45	6.4, 7.6	2.3″
ν SER	Sh 247	17 21 −12 51	4.3, 9.4	46″
ξ OPH	Don 832	17 21 −21 07	4.4, 8.9	4″
ARA	CorO 213	17 23 −58 28	6.9, 9.3	9″
ρ HER	Σ 2161	17 24 +37 09	4.5, 5.4	4″
HER	O Σ 329	17 25 +36 57	6.3, 9.9	33″
HER	Σ 2160	17 25 +15 36	6.4, 9.3	4″
γ ARA	h 4942	17 25 −56 23	3.3, 10.2	18″
OPH	β 128	17 27 −26 20	7.5, 9.7	4″
ARA	h 4949/Δ 216	17 27 −45 51	5.6, 6.5/7.1	2.0″/102″
OPH	Σ 2166	17 28 +11 23	7.2, 8.6	28″
SCO	Δ 217	17 29 −43 58	6.3, 8.5	13″
HER	Σ 2178	17 30 +34 56	7.3, 9.1	10″
OPH	Σ 2173	17 30 −01 04	6.1, 6.2	0.5″
SCO	Howe 39	17 30 −33 43	6.8, 9.6, 9.4	4,″ 59″
SCO	Howe 87	17 31 −39 01	7.4, 9.0	3″
ν DRA	Σ I 35	17 32 +55 11	4.9, 4.9	63″
HER	Σ 2181	17 32 +30 19	7.2, 9.4	27″
ARA	I 40	17 32 −46 02	6.0, 10.5	20″
SCO	I 603	17 33 −45 31	7.3, 8.8	1.2″
λ + υ SCO	–	17 34 −37 06	1.6, 2.7	35′ The Stingers
26 DRA	β 962	17 35 +61 52	5.3, 8.5, 8.1	1.6,″ 25″
53 OPH	Σ I 34	17 35 +09 35	5.8, 7.5	42″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
SER	h 4964	17 35 −11 15	5.5, 9.9	54″
SCO	h 4962/Ho 647	17 35 −32 35	5.7, 10.5/10.5	5″/13″ In OC NGC 6383
HER	Σ 2190	17 36 +21 00	6.1, 9.5	10″
SCO	Wg 212	17 37 −40 19	7.2, 9.7	13″
SCO	I 247	17 38 −37 52	6.8, 9.2	1.4″
OPH	Sh 251	17 39 +02 02	6.3, 7.4	110″
DRA	Σ 2218	17 40 +63 41	7.1, 8.3	1.7″
HER	O ΣΣ 157	17 41 +31 17	6.4, 8.5	115″
HER	Σ 2194	17 41 +24 31	6.5, 9.3	16″
ψ DRA	Σ 2241	17 42 +72 09	4.6, 5.6	30″
HER	h 1303	17 44 +14 25	6.2, 9.3	40″
APS	HdO 275	17 44 −72 13	6.8, 8.1	0.6″
61 OPH	Σ 2202	17 45 +02 35	6.1, 6.5	21″
HER	Σ 2224	17 46 +39 19	6.7, 10.0	8″
μ HER	Σ 2220	17 46 +27 43	3.4, 9.8	35″
HER	Σ 2215	17 47 +17 42	5.8, 7.8	0.6″
OPH	Σ 2223	17 49 +04 58	7.3, 8.6	18″
HER	Σ 2232	17 50 +25 17	6.7, 8.9	6″
ARA	h 4982	17 50 −48 17	6.8, 9.8	42″
ARA	h 4978	17 50 −53 37	5.7, 9.2	12″
SCO	Pz 5	17 51 −30 33	6.7, 8.1	10″
HER	O Σ 338	17 52 +15 20	7.2, 7.4, 9.9	0.8,″ 95″
OPH	S 694	17 52 +01 07	6.7, 7.3	79″
PAV	h 4979	17 52 −60 24	7.5, 10.5	10″
90 HER	β 130	17 53 +40 00	5.3, 8.8	1.5″
SER	Hu 189	17 53 −13 39	7.5, 8.7	1.5″
SCO	See 342	17 53 −34 54	6.4, 6.5	0.5″ In OC M7
DRA	O ΣΣ 163	17 56 +62 37	7.2, 7.7	55″
HER	Σ 2245	17 56 +18 20	7.4, 7.6	2.6″
SER	h 2814	17 56 −15 49	5.9, 9.2	20″
OPH	Σ 2244	17 57 +00 04	6.6, 6.9	0.6″
ARA	Rmk 22	17 57 −55 23	7.0, 7.9	2.4″
SCO	R 306	17 58 −36 00	6.8, 9.5	3″
DRA	Σ 2273	17 59 +64 09	7.6, 7.7	21″
HER	Σ 2259	17 59 +30 03	7.3, 8.4	20″
SGR	Pz 6	17 59 −30 15	5.4, 7.0	6″
SGR	Δ 219	17 59 −36 52	5.8, 7.1	53″
SGR	h 5000	17 59 −36 56	7.1, 9.0	8″
41/40 DRA	Σ 2308	18 00 +80 00	5.7, 6.0	19″
OPH	O ΣΣ 161	18 00 +08 51	7.1, 9.1	63″
67 OPH	H VI 2	18 01 +02 56	4.0, 8.1	54″
HER	β 1127	18 02 +44 14	7.4, 9.3	0.9″
95 HER	Σ 2264	18 02 +21 36	4.9, 5.2	6″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
SGR	H N 40/H N 6	18 02 −23 02	7.6, 10.4/8.7	6″/11″ In Trifid Nebula (M20)
DRA	Σ 2302	18 03 +75 47	6.9, 9.9, 9.4	6,″ 23″
DRA	Σ 2278	18 03 +56 26	7.1, 8.1, 8.5	37,″ 34″
HER	Σ 2277	18 03 +48 28	6.3, 8.9	27″
τ OPH	Σ 2262	18 03 −08 11	5.3, 5.9	1.5″
SGR	Arg 31	18 03 −24 15	6.9, 8.6	36″
7/9 SGR	–	18 03 −24 17	5.3, 6.0	900″ In Lagoon Neb (M8)
SGR	S 698	18 04 −22 30	7.2, 8.5	30″
HER	Es 471	18 05 +27 07	7.2, 10.3	30″
HER	O Σ 341	18 06 +21 27	7.4, 9.8, 10.3, 7.6	28,″ 66,″ 133″
OPH	Σ 2276	18 06 +12 00	7.1, 7.4	7″
70 OPH	Σ 2272	18 06 +02 30	4.2, 6.2	5″
HER	Σ 2282	18 06 +40 22	7.4, 8.4	2.5″
99 HER	AC 15	18 07 +30 34	5.1, 8.4	1.1″
CRA	h 5014	18 07 −43 25	5.7, 5.7	1.7″
100 HER	Σ 2280	18 08 +26 06	5.8, 5.8	14″
OPH	H V 74	18 08 +13 04	6.6, 9.6	42″
ARA	h 5015	18 08 −45 46	6.2, 9.6	4″
SGR	WNO 21	18 09 −25 28	6.8, 8.8	14″
HER	Hu 674	18 10 +50 24	7.5, 8.0	0.5″
HER	Σ 2289	18 10 +16 29	6.7, 7.2	1.2″
73 OPH	Σ 2281	18 10 +04 00	6.0, 7.5	0.6″
SGR	β 245	18 10 −30 44	5.8, 8.0	4″
SGR	β 132	18 11 −19 51	7.0, 7.1	1.3″
APS	HdO 284	18 13 −73 40	6.0, 9.0	2.5″
SER	β 131	18 14 −15 36	7.3, 9.3	3″
μ SGR	h 2822	18 14 −21 04	3.9, 10.5, 10.0	17,″ 49″
TEL	h 5033	18 15 −48 51	6.8, 9.8	17″
TEL	h 5034	18 16 −46 01	7.5, 8.6	2.2″
SGR	Sh 263	18 18 −18 48	6.8, 9.3	53″
η SGR	β 760	18 18 −36 46	3.1, 7.8	4″
SGR	β 639/Sh 264	18 19 −18 37	6.8, 7.3/ 7.6	0.5″/17″
SER	Σ 2303	18 20 −07 59	6.6, 9.3	1.6″
HER	Σ 2310	18 21 +22 48	6.8, 10.1	5″
SCT	Σ 2306	18 22 −15 05	7.9, 8.6, 9.0	10″, 10″
ξ PAV	Gale 2	18 23 −61 30	4.4, 8.1	3″
39 DRA	Σ 2323	18 24 +58 48	5.1, 8.1, 7.4	4,″ 89″
HER	Σ 2315	18 25 +27 23	6.6, 7.8	0.6″
SER	AC 11	18 25 −01 35	6.7, 7.2	0.9″
SCT	Σ 2313	18 25 −06 36	7.5, 8.7	6″
21 SGR	Jc 6	18 25 −20 32	5.0, 7.4	1.5″
TEL	h 5041	18 26 −53 38	7.3, 9.2	3″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
59 SER	Σ 2316	18 27 +00 12	5.4, 7.6	4″
HER	Σ 2320	18 28 +24 42	7.1, 8.9	1.2″
SGR	β 133	18 28 −26 38	6.6, 8.5	0.9″
SGR	WNO 6	18 29 −26 35	6.7, 8.0	42″
PAV	HdO 290	18 30 −57 31	5.8, 10.5	30″
SCT	Σ 2325	18 31 −10 48	5.8, 9.3	12″
SGR	Howe 43	18 31 −32 59	5.3, 9.8	3″
TEL	h 5045	18 31 −48 01	6.7, 9.7	8″
LYR	O Σ 356	18 33 +40 10	7.3, 9.9, 9.7	35,″ 50″
LYR	O ΣΣ 171	18 33 +38 50	7.0, 8.1	150″
OPH	O Σ 355	18 33 +08 16	6.4, 10.3	38″
κ CRA	Δ 222	18 33 −38 44	5.6, 6.2	21″
DRA	Σ 2348	18 34 +52 21	5.5, 8.7	25″
HER	Σ 2339	18 34 +17 44	7.5, 8.7	2.0″
SGR	Stone 62	18 34 −34 49	7.6, 7.8	2.1″
PAV	MlbO 5	18 34 −66 17	7.0, 9.1	5″
LYR	Σ 2351	18 36 +41 17	7.6, 7.6	5″
HER	O Σ 359	18 36 +23 36	6.4, 6.6	0.7″
HER	O Σ 358	18 36 +16 59	6.9, 7.1	1.8″
SER	Σ 2342	18 36 +04 56	6.5, 9.6	33″
α LYR	H V 39/Σ II 9	18 37 +38 47	0.0, 9.5/9.5	78″/118″ Vega
LYR	Σ 2349	18 37 +33 28	5.4, 9.4	7″
DRA	Σ 2377	18 38 +63 32	7.0, 9.8	17″
DRA	h 2836	18 38 +60 43	6.7, 9.9, 9.9	37,″ 55″
LYR	Σ 2362	18 38 +36 03	7.5, 8.7	4″
DRA	Σ 2368	18 39 +52 21	7.6, 7.8	1.8″
LYR	Σ 2367	18 41 +30 18	7.1, 8.8	14″
LYR	Σ 2372	18 42 +34 45	6.5, 7.7	25″
δ SCT	H V 36	18 42 −09 03	4.7, 9.2	53″
LYR	Σ 2380	18 43 +44 56	7.3, 8.7	25″
LYR	β pm	18 43 +39 18	6.6, 10.4	60″
ε-1/2 LYR	Σ 2382/Σ 2383	18 44 +39 40	5.0, 6.1/5.3, 5.4	2.1″/2.4″ The Double-Double - pairs 210″ apart. P.A. = 174
λ CRA	CorO 227	18 44 −38 19	5.1, 10.0	29″
ζ LYR	Σ I 38	18 45 +37 36	4.3, 5.6	44″
LYR	Σ 2390	18 46 +34 41	7.4, 8.6	4″
SER	Σ 2375	18 46 +05 30	6.3, 6.7	2.5″
5 AQL	Σ 2379	18 46 −00 58	5.9, 7.0	12″
SCT	Σ 2373	18 46 −10 30	7.4, 8.4	4″
LYR	Σ 2397	18 47 +31 25	7.5, 9.1	4″
HER	Σ 2401	18 49 +21 10	7.3, 9.3	4″
SCT	Σ 2391	18 49 −06 00	6.5, 9.6	38″
β LYR	Σ I 39	18 50 +33 22	3.3–4.3, 6.7, 9.9, 9.9	46,″ 67,″ 86″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
SCT	H VI 50	18 50 −05 55	6.2, 8.2	111″
PAV	R 314	18 50 −73 00	6.2, 8.1	1.9″
o DRA	Σ 2420	18 51 +59 23	4.8, 8.3	36″
AQL	Σ 2404	18 51 +10 59	6.9, 7.8	4″
CRA	h 5066	18 51 −41 04	6.5, 9.5	10″
HER	Σ 2411	18 52 +14 32	6.6, 9.6	13″
CRA	HdO 291	18 52 −41 43	6.5, 10.2	36″
DRA	Σ 2452	18 54 +75 47	6.7, 7.4	6″
δ LYR	Sh 586	18 54 +36 58	4.5, 5.6	630″ In OC Stph 1
AQL	O ΣΣ 176	18 54 +01 54	7.5, 7.5	95″
TEL	I 112/Δ 224	18 54 −47 16	7.1, 9.1/7.3	1.8″/87″
LYR	O Σ 525/Sh 282	18 55 +33 58	6.1, 9.1/ 7.6	1.8″/45″
HER	Σ 2415	18 55 +20 37	7.0, 8.9	1.9″
θ SER	Σ 2417	18 56 +04 12	4.6, 4.9	22″ Alya
DRA	Σ 2440	18 57 +62 24	6.6, 9.6	17″
DRA	Σ 2433	18 57 +56 45	7.1, 10.2	8″
LYR	h 1347	18 57 +45 51	7.3, 9.8	27″
LYR	β 648	18 57 +32 54	5.4, 7.5	0.8″
DRA	Σ 2438	18 58 +58 14	7.0, 7.4	0.9″
LYR	Σ 2431	18 59 +40 41	6.2, 9.6	19″
11 AQL	Σ 2424	18 59 +13 37	5.3, 9.3	20″
ε AQL	β pm	19 00 +15 04	4.0, 9.9, 10.0	130,″ 148″
AQL	Σ 2426	19 00 +12 53	7.5, 9.0	17″
16 LYR	h 1362	19 01 +46 56	5.0, 10.5	46″
CRA	BrsO 14	19 01 −37 04	6.3, 6.6	13″
DRA	Σ 2450	19 02 +52 16	6.5, 9.0	4″
SGE	h 2851	19 02 +19 07	6.9, 9.2	48″
AQL	Σ 2432	19 02 +12 32	6.7, 9.2	15″
SGR	h 5082	19 03 −19 15	6.2, 9.0, 10.5	8,″ 20″
ζ SGR	HdO 150/H V 78	19 03 −29 53	3.3, 3.5/9.9	0.5″/75″
LYR	Dawes 9	19 04 +43 53	6.8, 10.4	2.0″
SGR	H N 129	19 04 −22 54	6.9, 9.2	8″
VUL	Σ 2445	19 05 +23 20	7.3, 8.6	12″
15 AQL	Sh 286	19 05 −04 02	5.5, 7.0	39″
AQL	Σ 2449	19 06 +07 09	7.2, 7.7	8″
AQL	Σ 2446	19 06 +06 33	7.0, 8.9	9″
γ CRA	h 5084	19 06 −37 04	4.5, 6.4	1.3″
DRA	O Σ 369	19 07 +72 04	7.6, 7.9	0.7″
17 LYR	Σ 2461	19 07 +32 30	5.3, 9.1	4″
VUL	Σ 2457	19 07 +22 35	7.5, 9.5	10″
VUL	Σ 2455	19 07 +22 10	7.4, 9.4	9″
AQL	Σ 2447	19 07 −01 21	6.8, 9.6	14″
SGR	S 710	19 07 −16 14	6.1, 8.4	6″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
CYG	Σ 2479	19 08 +55 20	7.4, 9.4	7″
SGR	S 711	19 08 −26 50	7.0, 8.6	45″
LYR	Σ 2470	19 09 +34 58	7.0, 8.4	14″ Forms D-D with 2474
LYR	Σ 2474	19 09 +34 36	6.8, 7.9	16″ Forms D-D with 2470
LYR	Σ 2472	19 09 +37 55	7.5, 9	21″ Σ 2473 at 75″
LYR	Σ 2473	19 09 +37 56	10, 10	6″ Σ 2472 at 75″
AQL	Σ 2471	19 11 +08 07	7.5, 10.3	8″
PAV	h 5085	19 11 −60 03	7.6, 9.1	2.7″ At edge of GC NGC 6752
CYG	Σ 2486	19 12 +49 51	6.5, 6.7	7″
TEL	Δ 225	19 12 −51 48	7.2, 8.4	70″
SGE	β 139/O ΣΣ 177	19 13 + 16 51	7.1, 8.0/8.0	0.6″/100″
SGR	h 5094	19 13 −33 51	7.3, 7.8	28″
η LYR	Σ 2487	19 14 +39 09	4.4, 8.6	28″
LYR	O Σ 367	19 14 +34 34	7.3, 9.9	34″
DRA	Σ 2572	19 15 +83 28	6.3, 10.0	25″
AQL	O ΣΣ 178	19 15 +15 05	5.7, 7.8	90″
θ LYR	Sh 292	19 16 +38 08	4.4, 9.1, 10.9	100,″ 100″
LYR	O Σ 371	19 16 +27 27	7.0, 7.6, 9.8	0.9,″ 48″
AQL	O Σ 368	19 16 +16 10	7.3, 8.5	1.0″
AQL	Σ 2489	19 16 +14 33	5.7, 9.3	8″
DRA	Σ 2509	19 17 +63 12	7.4, 8.2	1.8″
PAV	Gale 3	19 17 −66 40	6.1, 6.4	0.5″
2 VUL	β 248	19 18 +23 02	5.4, 8.8	1.6″
23 AQL	Σ 2492	19 18 +01 05	5.3, 8.3	3″
SGR	S 715	19 18 −15 58	7.1, 7.9	8″
SGR	H V 77	19 18 −18 52	7.0, 9.9	37″
24 AQL	Σ I 40	19 19 +00 20	6.5, 6.8	427″ P.A. = 317
LYR	O ΣΣ 181	19 20 +26 39	7.4, 7.5	61″
28 AQL	S 717	19 20 +12 22	5.5, 9.0	60″
AQL	Σ 2494	19 20 −06 38	7.0, 10.4	26″
SGE	Σ 2504	19 21 +19 09	7.0, 9.0	9″
β-1 SGR	Δ 226	19 23 −44 28	4.0, 7.2	29″
2/3 SGE	Σ I 41	19 24 +16 56	6.3, 6.9	342″ P.A. = 80
31 AQL	β pm	19 25 +11 57	5.2, 8.7	100″
SGR	h 5113	19 25 −29 19	6.1, 10.1	10″
VUL	Σ 2521	19 26 +19 53	5.8, 10.5, 9.9	28,″ 70″ In OC Cr 399
4 VUL	h 2871	19 26 +19 48	5.2, 10.0	19″ In OC Cr 399
CYG	O ΣΣ 182	19 27 +50 09	7.3, 8.5	75″
CYG	Σ 2534	19 28 +36 32	7.6, 7.8	7″
TEL	h 5114	19 28 −54 20	5.9, 8.2	75″
α+8 VUL	Σ I 42	19 29 +24 40	4.6, 5.9	424″ P.A. = 30

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
AQL	Σ 2532	19 30 +02 54	6.1, 10.3	33″
AQL	Σ 2533	19 30 −00 27	7.4, 9.2	22″
SGR	Hu 75	19 30 −12 39	7.4, 7.9	0.7″
SGR	H N 119	19 30 −26 59	5.6, 8.8	7″
DRA	Σ 2549	19 31 +63 19	7.4, 9.3, 8.0	26,″ 51″
β CYG	Σ I 43	19 31 +27 58	3.4, 4.7	35″ Albireo
AQL	Σ 2535	19 31 −02 07	6.8, 9.8	25″
DRA	Σ I 44	19 33 +60 10	6.3, 8.3	76″
VUL	Σ 2540	19 33 +20 25	7.5, 9.2	5″
VUL	O Σ 375	19 35 +18 08	7.5, 8.7	0.7″
AQL	H V 104	19 36 +15 54	7.3, 9.8	39″
AQL	Σ 2543	19 36 +06 00	6.8, 9.7	13″
ε SGE	H VI 26	19 37 +16 28	5.8, 8.4	87″
52 SGR	β 654	19 37 −24 53	4.7, 9.2	2.5″
CYG	h 1428	19 38 +49 17	6.6, 9.5	25″
SGE	H N 84	19 39 +16 34	6.4, 9.5	28″
AQL	Σ 2545	19 39 −10 09	6.8, 8.5	4″
SGR	S 722	19 39 −16 54	7.2, 7.5	10″
DRA	Σ 2573	19 40 +60 30	6.5, 8.9	18″
CYG	Σ 2557	19 40 +29 45	7.5, 10.0	11″
VUL	Σ 2560	19 41 +23 43	6.6, 9.9	14″
54 SGR	h 599	19 41 −16 18	5.4, 7.7	45″
16 CYG	Σ I 46	19 42 +50 32	6.0, 6.2	39″ Near PN NGC 6826
CYG	O Σ 383	19 43 +40 43	6.9, 8.4	0.9″
CYG	Sei 666	19 43 +38 40	6.7, 9.7	25″
χ AQL	O Σ 380	19 43 +11 50	5.6, 6.8	0.5″
AQL	Σ 2562	19 43 +08 23	6.9, 8.7	27″
AQL	Σ I 45	19 43 −08 18	7.0, 7.3	96″
δ CYG	Σ 2579	19 45 +45 08	2.9, 6.3	2.5″
CYG	Σ 2578	19 46 +36 05	6.4, 7.0	15″
CYG	H V 137	19 46 +35 01	6.2, 9.2	39″
17 CYG	Σ 2580	19 46 +33 44	5.1, 9.3, 9.0	26,″ 135″
CYG	S 726	19 47 +32 53	6.2, 9.2	29″
ε DRA	Σ 2603	19 48 +70 16	4.0, 6.9	3″
CYG	O Σ 387	19 49 +35 19	7.2, 7.7	0.5″
VUL	Σ 2586	19 49 +24 58	7.5, 10.4	4″
ζ SGE	Σ 2585	19 49 +19 09	5.0, 9.0	8″
π AQL	Σ 2583	19 49 +11 49	6.3, 6.8	1.4″
AQL	Σ 2581	19 50 −11 25	7.2, 8.8	38″
19 CYG	h 603	19 51 +38 43	5.4, 10.5	56″
χ CYG	–	19 51 +32 55	4.2–14, 9, 9	26,″ 135″
α AQL	Σ II 10	19 51 +08 52	0.9, 9.8, 10.0	192,″ 247″ Altair
AQL	Σ 2587	19 51 +04 05	6.7, 9.4	4″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
PAV	I 121	19 51 −59 12	5.6, 7.2	0.8″
CYG	O Σ 389	19 52 +31 08	7.1, 9.5	12″
VUL	OΣ 388	19 52 +25 51	7.5, 9.6	29″
AQL	Σ 2590	19 52 +10 21	6.5, 10.3	13″
DRA	Σ 2604	19 53 +64 11	6.9, 9.0	28″
VUL	Σ I 48	19 53 +20 20	7.1, 7.3	42″
TEL	Δ 227	19 53 −54 58	5.8, 6.4	23″
CYG	O ΣΣ 194	19 54 +59 43	6.1, 9.4	75″
13 VUL	Dju 4	19 54 +24 05	4.6, 7.8	0.8″
AQL	Σ 2596	19 54 +15 18	7.3, 8.7	2.0″
SGR	h 2904	19 54 −23 56	6.2, 10.2	30″
CYG	O Σ 390	19 55 +30 12	6.6, 9.5	9″
AQL	Σ 2597	19 55 −06 44	6.8, 7.9	1.0″
57 AQL	Σ 2594	19 55 −08 14	5.7, 6.3	36″
ψ CYG	Σ 2605	19 56 +52 26	5.0, 7.5	3″
η CYG	h 1455	19 56 +35 05	3.9, 10, 10	46,″ 50″
CYG	Σ 2607	19 58 +42 16	6.6, 9.1	3″
AQL	AC 12	19 58 −02 14	7.4, 8.2	1.4″
TEL	Δ 229	19 58 −51 54	7.5, 8.1	80″
CYG	Σ 2609	19 59 +38 06	6.7, 7.6	1.9″
CYG	O Σ 394	20 00 +36 25	7.1, 9.9	11″
VUL	h 1462	20 00 +25 57	7.5, 9.9	37″
13 SGE	H IV 100	20 00 +17 31	5.6, 10.3, 10.3	114,″ 24″
SGE	S 730	20 00 +17 37	7.1, 8.7, 9.5, 9.9	114,″ 80,″ 40″
26 CYG	H V 47	20 01 +50 06	5.2, 8.9, 10.3	41,″ 167″
CYG	Webb (no #)	20 01 +36 35	6.7, 8.8	71″
AQL	Σ 2613	20 01 +10 45	7.5, 8.0	4″
AQL	H I 93	20 01 −00 12	7.5, 8.1	2.0″
TEL	I 256	20 01 −47 24	7.2, 9.2	1.0″
CYG	O ΣΣ 196	20 02 +40 52	7.0, 9.6	55″
16 VUL	O Σ 395	20 02 +24 56	5.8, 6.2	0.8″
AQL	Σ 2616	20 03 +14 35	6.8, 9.6	4″
SGE	O Σ 396	20 03 +18 30	6.1, 9.4	47″
CYG	h 1470	20 04 +38 20	7.3, 9.4	29″
CYG	Σ 2624	20 04 +36 01	7.1, 7.7, 9.1	1.9,″ 42″
15 SGE	β pm	20 04 +17 04	5.9, 6.8	204″ P.A. = 205
DRA	Σ 2640	20 05 +63 53	6.3, 9.5	6″
CYG	Sei 878	20 06 +35 58	5.5, 9.5	12″
CYG	Sh 314	20 06 +35 47	6.8, 9.5, 7.3	11,″ 35″ In OC NGC 6871
SGR	See 404	20 06 −33 00	6.9, 7.9	0.5″
DRA	Σ 2650	20 07 +66 18	7.0, 9.9	22″
AQL	β 428	20 07 +12 56	7.5, 8.8	0.8″
AQL	O Σ 198	20 07 +07 35	7.1, 7.6	65″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
AQL	Σ 2628	20 08 +09 24	6.6, 8.7	3″
κ CEP	Σ 2675	20 09 +77 43	4.4, 8.3	7″
θ SGE	Σ 2637	20 10 +20 55	6.6, 8.9, 7.5	12,″ 89″
AQL	Σ 2635	20 10 +08 27	6.6, 10.1	7″
AQL	S 735	20 11 −00 08	7.1, 8.5	55″
PAV	HdO 295	20 11 −57 31	6.8, 7.7	0.6″
AQL	Σ 2644	20 13 +00 52	6.9, 7.1	2.6″
AQL	Σ 2643	20 13 −03 00	7.0, 9.5	3″
CYG	Σ 2658	20 14 +53 07	7.2, 9.4	5″
ο-1 CYG	Σ I 50	20 14 +46 44	3.8, 7.7, 4.8	107,″ 338″ P.A. = 325
CYG	O Σ 403/Σ 2657	20 15 +42 06	7.4, 7.6/10.0	0.8″/12″
29 CYG	β pm	20 14 +36 48	5.0, 6.7	216″ P.A. = 156
VUL	Σ 2653	20 14 +24 14	6.7, 9.2	2.9″
AQL	Σ 2646	20 14 −06 03	7.5, 9.3	18″
SGR	h 5178	20 14 −34 07	7.1, 8.2	2.8″
AQL	Σ 2654	20 15 −03 30	7.0, 8.1	14″
PAV	h 5171	20 15 −64 26	7.0, 9.8, 10.0	18,″ 34″
CYG	O Σ 404	20 16 +52 30	7.4, 9.9	30″
ο-2 CYG	S 743	20 16 +47 43	4.0, 9.5	209″
CYG	Ho 588	20 17 +31 30	7.0, 8.8	51″
CYG	Σ 2671	20 18 +55 24	6.0, 7.5	4″
CYG	Σ 2666	20 18 +40 44	6.0, 8.2	2.8″
α-1/2 CAP	Σ I 51	20 18 −12 33	3.7, 4.3	378″ P.A. = 292 (10.6 & 9.6-mag. comps. at 7″ & 46″ are h 607 & h 608, respectively)
SGR	Δ 230	20 18 −40 11	7.4, 7.7	10″
DEL	Σ 2665	20 19 +14 22	6.9, 9.6	3″
σ CAP	H V 87 = Sh 380	20 19 −19 07	5.4, 9.4	56″
CYG	O ΣΣ 205	20 20 +41 08	7.1, 8.9	46″
CYG	Σ 2668	20 20 +39 24	6.3, 8.5	3″
SGR	h 5188	20 20 −29 12	6.7, 10.1, 7.6, 10.0	4,″ 27,″ 5″
β -1/2 CAP	Σ I 52	20 21 −14 47	3.2, 6.1	207″ P.A. = 267
γ CYG	–	20 22 +40 15	2.2, 5.4	141″
VUL	h 1504	20 22 +26 18	7.1, 10.5, 9.9	22,″ 52″
CYG	O ΣΣ 207	20 23 +42 59	6.4, 8.0	87″
CYG	O ΣΣ 206	20 23 +39 13	6.7, 8.6	43″
κ-2 SGR	β 763	20 24 −42 25	6.0, 6.9	0.8″
CYG	Σ 2687	20 26 +56 38	6.4, 8.3	26″
α PAV	h 5193	20 26 −56 44	1.9, 9.1, 10.5	249,″ 17″
π CAP	β 60	20 27 −18 13	5.1, 8.5	3″
SGR	R 321	20 27 −37 24	6.6, 8.1	1.5″
75 DRA	β pm	20 28 +81 25	5.5, 6.7	197″ P.A. = 282
DEL	Ho 131	20 28 +18 46	6.8, 10.2	4″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
AQL	S 749	20 28 −02 06	6.8, 7.5	60″
ρ CAP	Sh 323	20 29 −17 49	5.0, 6.9, 6.7	1.3,″ 259″
ω-1 CYG	β 669	20 30 +48 57	5.0, 9.5	56″
DEL	S 752	20 30 +19 25	6.6, 7.0	106″
1 DEL	β 63	20 30 +10 54	6.2, 8.0	0.9″
ο CAP	Sh 324	20 30 −18 35	5.9, 6.7	22″
CYG	Sh 755	20 31 +49 13	6.9, 9.2	60″ In field with Sh 756
ω-2 CYG	Sh 756	20 31 +49 13	5.4, 10.1	57″ In field with Sh 755
DEL	β 363	20 31 +20 36	6.2, 10.0	12″
DEL	Σ 2690	20 31 +11 16	7.1, 7.4	17″
VUL	Σ 2695	20 32 +25 48	6.5, 8.3	0.6″
AQL	h 1529	20 33 −06 13	7.4, 9.6	32″
CYG	O Σ 408	20 34 +34 41	6.7, 9.7	1.5″
CYG	Σ 2700	20 35 +32 30	7.0, 8.8	24″
PAV	Δ 231	20 37 −71 04	7.1, 8.9	57″
CYG	Σ 2717	20 38 +60 45	7.2, 9.7, 9.7	1.8,″ 43″
CYG	Σ 2705	20 38 +33 22	7.5, 8.5	3″
48 CYG	Σ I 53	20 38 +31 34	6.3, 7.5	183″ P.A. = 177
β DEL	β 151	20 38 +14 36	4.1, 5.0	0.5″
CYG	Σ 2708	20 39 +38 38	7.0, 8.7	35″
CYG	O Σ 410	20 40 +40 35	6.7, 6.8, 8.7	0.9,″ 68″
DEL	O Σ 409	20 40 +03 26	7.1, 10.2, 8.4	17,″ 65″
CYG	h 612	20 41 +39 05	6.5, 9.8	48″
49 CYG	Σ 2716	20 41 +32 18	5.8, 8.1	3″
MIC	h 5211	20 41 −42 24	6.5, 10.4	20″
CEP	β 152	20 42 +57 23	7.3, 8.1	1.0″
μ-2 OCT	Δ 232	20 42 −75 21	6.5, 7.1	17″
DEL	Σ 2723	20 45 +12 19	7.0, 8.3	1.0″
52 CYG	Σ 2726	20 46 +30 43	4.2, 8.7	6″ In Veil Nebula (NGC 6960)
λ CYG	O Σ 413	20 47 +36 29	4.9, 6.1	0.9″
γ DEL	Σ 2727	20 47 +16 07	4.4, 5.0	9″
DEL	Σ 2725	20 46 +15 54	7.5, 8.2	6″ In field with γ DEL
CYG	O Σ 414	20 47 +42 25	7.4, 8.9	10″
λ CYG	O Σ 413/S 765	20 47 +36 29	4.7, 6.3/9.9	0.9″/85″
T CYG	β 677	20 47 +34 22	4.9, 10.0	10″
CAP	β 153	20 47 −26 25	7.3, 9.1	1.6″
CAP	h 5220	20 47 −26 52	7.1, 10.0	13″
13 DEL	β 65	20 48 +06 00	5.6, 8.2	1.5″
CAP	S 763	20 48 −18 12	7.2, 7.8	16″
CEP	O ΣΣ 211	20 49 +58 45	6.7, 7.9	108″
CYG	Σ 2732	20 49 +51 55	6.4, 8.6	4″
CYG	Es 94	20 50 +50 08	6.9, 9.9, 10.4	102,″ 2.5″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
DEL	O ΣΣ 210	20 50 +05 33	6.3, 8.8	80″
CAP	h 5226	20 50 −27 22	7.3, 8.8	18″
α MIC	h 5224	20 50 −33 47	4.9, 10.0	20″
CYG	β 155	20 51 +51 25	7.3, 8.0	0.9″
CYG	β 67	20 51 +30 55	6.9, 10.2	1.6″ At center of Veil Nebula
4 AQR	Σ 2729	20 51 −05 38	6.4, 7.4	0.9″
MIC	h 5228	20 52 −40 54	7.4, 9.3	32″
PAV	Rmk 26	20 52 −62 26	6.2, 6.6	2.4″
CAP	h 3003	20 53 −23 47	6.3, 8.5	1.7″
CYG	O Σ 422	20 54 +45 07	7.5, 9.2	2.8″
CYG	O Σ 423	20 55 +42 31	7.0, 9.5	2.9″
IND	I 18	20 55 −52 07	7.0, 10.2	4″
DEL	Σ 2735	20 56 +04 32	6.5, 7.5	1.9″
AQR	Howe 55	20 57 +00 28	6.1, 9.8	26″
CYG	Σ 2741	20 58 +50 28	5.9, 6.8	2.0″
DEL	Σ 2738	20 59 +16 26	7.5, 8.6, 8.1	15,″ 210″
1 EQU	Σ 2737	20 59 +04 18	6.0, 6.3, 7.1	0.7,″ 10″ Sometimes listed ε EQU
59 CYG	Σ 2743	21 00 +47 31	4.6, 9.4	20″
DEL	–	21 00 +19 20	5.7, 9.6	47″
DEL	O ΣΣ 213	21 00 +16 49	6.7, 9.4	70″
60 CYG	O Σ 426	21 01 +46 09	5.4, 9.6	2.5″
CEP	Σ 2751	21 02 +56 40	6.2, 6.9	1.6″
CYG	H IV 113	21 02 +39 31	6.6, 9.5	19″
λ EQU	Σ 2742	21 02 +07 11	7.4, 7.6	3″
MIC	Δ 236	21 02 −43 00	6.7, 7.0	58″
AQL	Σ 2744	21 03 +01 32	6.8, 7.3	1.3″
CYG	O ΣΣ 214	21 04 +41 38	6.4, 8.7	57″
12 AQR	Σ 2745	21 04 −05 49	5.8, 7.5	2.5″
IND	I 130	21 04 −47 58	7.1, 10.1	3″
η MIC	See 437	21 06 −41 23	5.7, 7.9	128″
61 CYG	Σ 2758	21 07 +38 45	5.3, 6.1	31″
OCT	Gli 263	21 07 −80 42	7.3, 9.6	5″
AQR	Σ 2755	21 08 −00 10	6.8, 10.4	24″
CYG	Σ 2762	21 09 +30 12	5.7, 8.1, 8.9	3,″ 58″
CYG	β 159	21 10 +47 42	6.5, 9.6	1.3″
VUL	Σ 2769	21 10 +22 27	6.7, 7.4	18″
γ = 6 EQU	Σ I 54	21 10 +10 08	4.7, 5.9	353″ P.A. = 153
IND	Hu 1626	21 11 −52 20	7.3, 8.5	1.2″
CEP	O Σ 436	21 12 +76 19	7.0, 10.5	12″
CEP	Σ 2780	21 12 +59 59	6.1, 6.8	1.0″
MIC	β 251	21 12 −30 35	7.4, 9.4	2.1″
CEP	H I 48	21 14 +64 24	7.0, 7.2	0.6″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
PEG	Hu 767	21 14 +15 59	7.0, 7.0	0.7″
δ EQU	Σ 2777	21 14 +10 00	5.3, 9.4	48″
EQU	S 781	21 13 +07 13	7.2, 7.4	184″ P.A. = 172
τ CYG	AGC 13	21 15 +38 03	3.8, 6.4	0.7″
CEP	Σ 2796	21 16 +78 36	7.4, 9.6	26″
υ CYG	O Σ 433	2118 +34 54	5.4, 10.0, 10.0	15,″ 22″
CEP	Es 137	21 19 +61 52	6.7, 10.3	45″
CEP	Σ 2790	21 19 +58 37	5.8, 9.3	5″
CYG	Es 98	21 19 +52 19	7.3, 10.0, 9.8	26,″ 30″
CYG	O Σ 434	21 19 +39 45	6.7, 9.9	24″
EQU	β 163	21 19 +11 34	7.4, 8.9	0.7″
IND	h 5259	21 19 −47 03	7.1, 10.4	27″
CYG	S 786	21 20 +53 03	6.9, 9.2	47″
EQU	Σ 2786	21 20 +09 31	7.5, 8.2	3″
CAP	β 271	21 20 −26 21	6.7, 9.8	1.9″
θ IND	h 5258	21 20 −53 27	4.5, 6.9	7″
CYG	O Σ 437	21 21 +32 27	7.2, 7.4	2.3″
1 PEG	Σ II 11	21 22 +19 48	4.2, 7.6	36″
AQR	Σ 2787	21 22 +02 02	7.5, 8.6	23″
CYG	Σ I 55	21 24 +37 21	6.6, 6.6	365″
θ-2 MIC	β 766	21 24 −41 00	6.4, 7.0	0.5″
PEG	Cou 430	21 25 +18 28	7.5, 8.4	0.5″
69 CYG	S 790	21 26 +36 40	5.9, 10.3, 10.2	33,″ 53″
CEP	O Σ 440	21 27 +59 45	6.3, 10.4	9″
PEG	Σ 2797	21 27 +13 41	7.4, 8.8	4″
MIC	MlbO 6	21 27 −42 33	5.6, 8.2	2.9″
β CEP	Σ 2806	21 29 +70 34	3.2, 8.6	13
2 PEG	h 1647	21 29 +22 11	6.1, 10.2	41″
PEG	Σ 2799	21 29 +11 05	7.4, 7.4	1.9″
CYG	Σ 2803	21 30 +52 56	7.2, 10.3	25″
CEP	Σ I 57	21 34 +66 44	7.0, 7.2	180″
ε CAP	H VI 6	21 37 −19 28	4.7, 9.5	68″
3 PEG	Σ I 56	21 38 +06 37	6.2, 7.5	39″
AQR	Σ 2809	21 38 −00 23	6.2, 9.4	31″
CEP	Σ 2819	21 40 +57 35	7.4, 8.6	12″ In field with Σ 2816/both in OC IC 1396
CEP	Σ 2816	21 40 +57 29	5.6, 7.5, 7.5	12,″ 20″ In OC IC 1396
CYG	Es 825	21 40 +49 08	7.4, 8.7	55″
75 CYG	AC 20	21 40 +43 16	5.1, 10.4	2.7″
76 CYG	S 796	21 42 +40 48	6.1, 10.1	60″
GRU	h 5288	21 42 −37 56	7.6, 9.3	20″
CYG	Σ 2820	21 43 +42 26	7.4, 9.8	16″
CYG	S 799	21 43 +38 17	5.6, 6.9	150″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
μ CYG	Σ 2822	21 44 +28 45	4.7, 6.2, 6.9	1.9,″ 217″ P.A. = 50
ε PEG	S 798	21 44 +09 52	2.5, 8.7	144″ Enif
IND	Jc 25	21 44 −57 20	6.5, 6.9, 7.5	152,″ 187″ P.A. = 214
CEP	Mlr 16	21 45 +62 28	6.0, 9.5	17″
PEG	Ho 465	21 46 +22 10	7.1, 9.1	45″
CAP	β 1036	21 48 −17 18	7.3, 10.3	5″
GRU	BrsO 15	21 48 −47 18	5.7, 8.7	55″
CEP	Σ 2836	21 49 +66 48	6.5, 10.0	12″
IND	I 19	21 49 −65 30	7.3, 8.7	1.3″
CEP	O Σ 451	21 51 +61 37	7.5, 8.5	4″
PSA	h 3059	21 51 −27 56	7.4, 10.5	25″
λ OCT	h 5278	21 51 −82 43	5.6, 7.3	3″
CEP	Σ 2843	21 52 +65 45	7.0, 7.3	1.4″
CEP	Σ 2844	21 52 +64 54	7.2, 9.2	12″
CEP	Σ 2840	21 52 +55 48	5.6, 6.4	18″
PEG	h 947	21 52 +19 50	5.8, 9.1	19″
PEG	Σ 2834	21 52 +19 18	6.9, 10.2	4″
CEP	O ΣΣ 226	21 53 +68 06	7.5, 9.5	76″
CEP	S 800	21 54 +62 37	7.1, 7.9	63″ In OC NGC 7160
ARA	h 5015	18 08 −45 46	6.2, 9.6	4″
PEG	Σ 2841	21 54 +19 43	6.5, 8.0	23″
AQR	Σ 2838	21 55 −03 18	6.3, 9.5	16″
CAP	h 616	21 55 −11 59	8.1, 10.3	30″
CEP	O Σ 457	21 56 +65 19	5.9, 8.1	1.4″
CEP	O Σ 458	21 56 +59 48	6.9, 8.4	0.8″
CEP	Σ 2873	21 58 +82 52	7.0, 7.5	14″
PEG	Σ 2848	21 58 +05 56	7.2, 7.7	11″
η PSA	β 276	22 01 −28 27	5.7, 6.8	1.8″
29 AQR	S 802	22 02 −16 58	7.1, 7.2	4″
OCT	h 5306	22 03 −76 07	6.0, 10.5	35″
ξ CEP	Σ 2863	22 04 +64 38	4.4, 6.4	8″
CEP	O Σ 461	22 04 +59 49	6.7, 10.0, 7.8, 7.0, 7.0	89,″ 185,″ 237″ (P.A. = 38), 136″
19 CEP	β 697	22 05 +62 17	5.1, 10.1	60″
PEG	Σ 2857	22 06 +10 06	7.1, 9.8	20″
CEP	Σ 2872	22 09 +59 17	7.1, 8.0, 8.0	22,″ 0.8″
LAC	h 1735	22 09 +44 51	6.7, 9.7, 6.8	27,″ 110″
π + 27 PEG	–	22 10 +33 11	4.3, 5.6	900″
CEP	Σ 2883	22 11 +70 08	5.6, 8.6	14″
LAC	h 1741	22 11 +50 49	5.4, 10.4	28″
PSA	β 769	22 12 −34 28	7.0, 8.5	0.9″
GRU	h 5319	22 12 −38 18	7.6, 7.7	2.1″
CEP	Σ 2893	22 13 +73 18	6.2, 7.9	29″
LAC	h 1746	22 14 +39 43	4.5, 10.5	28″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
PEG	Σ 2877	22 14 +17 11	6.7, 9.2	22″
PEG	Σ 2878	22 14 +07 59	6.9, 8.1	1.5″
41 AQR	H N 56	22 14 −21 04	5.6, 6.7	5″
LAC	Σ 2890	22 15 +49 53	8.5, 8.5, 9.5	9,″ 73″ In OC NGC 7243
μ-1/2 GRU	–	22 16 −41 21	4.8, 5.1	900″
GRU	HdO 298	22 18 −53 38	5.4, 9.7	5″
LAC	Σ 2894	22 19 +37 46	6.2, 8.9	16″
PEG	O Σ 469	22 20 +35 07	7.5, 9.7	28″
CEP	O Σ 470	22 21 +66 58	7.4, 9.9	4″
32 PEG	Ho 615	22 21 +28 20	4.8, 9.1	73″
CEP	Σ 2903	22 22 +66 42	7.1, 7.8	4″
LAC	Σ 2902	22 24 +45 21	7.5, 8.2	6″
33 PEG	Σ 2900	22 24 +20 51	6.3, 8.5	90″
51 AQR	β 172	22 24 −04 50	6.5, 6.5	0.5″
GRU	Jc 19	22 25 −41 27	6.7, 8.2	18″
AQR	S 808	22 26 −20 14	7.1, 8.0	7″
OCT	Δ 238	22 26 −75 01	6.2, 8.9	21″
LAC	Σ 2906	22 27 +37 27	6.5, 9.6	4″
53 AQR	Sh 345	22 27 −16 45	6.3, 6.4	1.5″
δ TUC	h 5334	22 27 −64 58	4.5, 8.7	7″
CEP	Kr 60	22 28 +57 42	9.8, 11.3, 10.1	3,″ 75″
35 PEG	β pm	22 28 +04 42	4.8, 9.8	98″
δ CEP	Σ I 58	22 29 +58 25	3.5–4.4, 6.1	41″
ζ AQR	Σ 2909	22 29 −00 01	4.3, 4.5	2.0″
δ-1/2 GRU	–	22 29 −43 30	3.4, 4.1	900″
CEP	O Σ 473	22 30 +57 14	6.8, 10.1	15″
LAC	Franks (no #)	22 30 +49 21	6.5, 9.7	64″
37 PEG	Σ 2912	22 30 +04 26	5.8, 7.1	0.7″
δ-2 GRU	Δ 239	22 30 −43 45	4.1, 9.0	60″
σ AQR	–	22 31 −10 41	4.8, 8.5	4″
LAC	Roe 47	22 32 +39 47	5.8, 9.8, 10.1	43,″ 32″
β PSA	Pz (no #)	22 32 −32 21	4.3, 7.1	30″
CEP	Σ 2923	22 33 +70 22	6.3, 9.2	10″
CEP	Σ 2924	22 33 +69 55	6.5, 7.0	0.5″
LAC	h 1786	22 34 +40 46	7.3, 8.7	44″
LAC	h 1791	22 36 +56 52	7.5, 9.7	17″
8 LAC	Σ 2922/A 1469	22 36 +39 38	5.7, 6.3/10.5, 9.3	22″/49,″ 82″
AQR	H V 96	22 36 −20 56	7.5, 9.5	51″
PSA	Δ 241	22 37 −31 40	5.9, 7.6	93″
κ AQR	h 5529	22 38 −04 14	5.0, 8.5	95″
10 LAC	S 813	22 39 +39 03	4.8, 9.3	62″
AQR	h 5355	22 39 −14 04	7.5, 8.8, 9.4	82,″ 108″
PSC	H VI 119/H N 117	22 40 −28 20	6.4, 7.5/8.6	86″/3″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
LAC	Es 1028	22 42 +54 15	7.5, 10.0	6″
12 LAC	S 815	22 42 +40 14	5.3, 9.3	66″
AQR	H N 140	22 42 −05 06	7.1, 9.7	75″
CEP	O Σ 481	22 44 +78 31	7.5, 9.3	2.4″
AQR	Σ 2939	22 45 −09 39	7.4, 10.4	11″
CEP	O Σ 480	22 46 +58 04	7.6, 8.6	31″ On edge of OC NGC 7380
η PEG	β 1144	22 43 +30 13	3.0, 9.9	94″
LAC	Σ 476	22 43 +47 10	7.1, 7.4	0.5″
AQR	Σ 2936	22 43 +01 13	7.0, 10.0	5″
AQR	Σ 2935	22 43 −08 19	6.8, 7.9	2.4″
GRU	CorO 252	22 43 −47 13	6.0, 10.0	8″
LAC	Σ 2942	22 44 +39 28	6.2, 8.9	2.9″
GRU	h 5362	22 47 −46 56	6.6, 9.9	10″
CEP	O Σ 482	22 48 +83 09	5.0, 9.7	4″
AQR	Σ 2944	22 48 −04 14	7.3, 7.7, 8.6	2.0,″ 58″
69 AQR	Σ 2943	22 48 −14 03	5.7, 9.6	22″
CEP	Σ 2947	22 49 +68 34	6.9, 7.0	4″
CEP	Σ 2948	22 50 +66 33	7.2, 8.9	2.6″
τ AQR	H VI 97	22 50 −13 36	4.0, 8.5	133″
CEP	Σ 2950	22 51 +61 42	6.0, 7.1	1.3″
γ PSA	h 5367	22 52 −32 53	4.5, 8.2	4″
CEP	O ΣΣ 238	22 53 +67 59	7.0, 7.6	69″
16 LAC	Σ 2960	22 56 +41 36	5.6, 8.7	63″
PEG	Cou 240	22 56 +22 57	7.4, 7.8	0.6″
δ PSC	Howe 91	22 56 −32 32	4.2, 9.2	5″
PEG	Σ 2958	22 57 +11 51	6.6, 8.9	4″
PSA	h 5371	22 58 −26 06	7.4, 8.9	9″
52 PEG	O Σ 483	22 59 +11 44	6.1, 7.3	0.5″
PEG	Σ 2968	23 01 +31 05	6.7, 9.5	3″
PEG	Σ 2969	23 01 +26 46	8.1, 10.0	4″
CEP	O Σ 486	23 03 +60 27	6.7, 9.3	34″
CAS	Σ 485	23 03 +55 14	6.5, 10.2	19″
AND	Σ 2973	23 03 +44 04	6.4, 10.1	8″
AQR	β 384	23 03 −18 32	6.8, 8.8	1.1″
GRU	β 1011	23 03 −36 25	6.5, 9.5	2.1″
PEG	O Σ 488	23 07 +20 35	6.7, 10.4	14″
υ GRU	β 773	23 07 −38 54	5.7, 8.2	1.0″
θ GRU	Jc 20	23 07 −43 31	4.5, 6.6, 7.8	1.4,″ 160″
GRU	Δ 246	23 07 −50 41	6.3, 7.1	9″
π CEP	O Σ 489	23 08 +75 23	4.6, 6.8	1.1″
PEG	Σ 2978	23 08 +32 50	6.4, 7.5	8″
TUC	Δ 245	23 09 −59 44	7.5, 9.4	14″
CAS	O Σ 490	23 10 +57 27	7.3, 9.3	1.3″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
AND	Σ 2987	23 10 +49 01	7.3, 10.2	4″
AND	Σ 2985	23 10 +47 58	7.2, 8.0	16″
PEG	Σ 2986	23 10 +14 26	6.6, 8.9	32″
57 PEG	Σ 2982	23 10 +08 41	5.1, 9.7	33″
89 AQR	Rst 3320	23 10 −22 27	5.1, 5.9	0.5″
AND	h 1853	23 11 +45 31	7.2, 10.4	30″
PEG	Σ 2991	23 13 +11 04	6.0, 10.2	33″
PEG	h 1859	23 14 +29 46	6.4, 9.9	35″
AQR	Σ 2993	23 14 −08 55	7.6, 8.2	25″
ψ-1 AQR	Σ 12	23 16 −09 05	4.4, 9.9	49″
TUC	Δ 247	23 18 −61 00	6.9, 8.2	50″
ο CEP	Σ 3001	23 19 +68 07	5.0, 7.3	3″
AND	Es 2725	23 19 +48 55	7.3, 8.6	53″
AND	O Σ 493	23 19 +48 30	7.5, 10.5	8″
96 AQR	h 5394	23 19 −05 07	5.6, 10.5	11″
94 AQR	Σ 2998	23 19 −13 28	5.3, 7.0	12″
TUC	h 5392	23 19 −58 18	7.5, 9.2	45″
AND	Σ 3004	23 21 +44 07	6.3, 10.1	14″
AQR	h 3184	23 21 −18 33	7.3, 8.4	5″
GRU	Rst 5560/Δ 248	23 21 −50 18	6.2, 8.9/6.6	1.3″/17″
PEG	Σ 3007	23 23 +20 34	6.7, 9.8	6″
PSC	Σ 3009	23 24 +03 43	6.9, 8.8	7″
AQR	Σ 3008	23 24 −08 28	7.2, 7.7	6″
GRU	Δ 249	23 24 −53 49	6.1, 7.1	26″
4 CAS	H VI 24	23 25 +62 17	5.2, 7.7, 8.6, 9.6	99,″ 215,″ 10″
PHE	Δ 250	23 27 −50 17	7.7, 8.7	30″
CEP	Σ 3017	23 28 +74 07	7.5, 8.6	1.6″
PEG	Σ 3012	23 28 +16 38	8.2, 9.3	2.8″
CAS	Sh 355	23 30 +58 33	4.9, 7.2	76″
PEG	Σ 3018	23 30 +30 50	7.4, 9.8	19″
TUC	h 5402	23 31 −69 05	7.2, 9.1	36″
PEG	Σ 3023	23 32 +17 24	7.2, 9.9	1.9″
101 AQR	B 1900	23 33 −20 55	4.4, 7.1	0.9″
CAS	Σ I 60	23 34 +60 28	7.3, 7.5	234″ P.A. = 211
72 PEG	β 720	23 34 +31 20	5.7, 6.1	0.5″
TUC	h 5403	23 35 −64 41	7.2, 10.0	35″
SCL	Howe 93	23 37 −31 52	6.7, 9.9	6″
AND	O Σ 500	23 38 +44 26	6.1, 7.4	0.5″
AQR	h 316	23 38 −13 04	5.7, 9.6	30″
AND	Σ 3028	23 39 +35 02	7.1, 10.0	15″
AND	O Σ 501	23 40 +37 39	6.5, 9.9	15″
θ PHE	Δ 251	23 40 −46 38	6.5, 7.3	4″
PEG	β 858	23 41 +32 34	7.4, 8.9	0.8″

Object/Constellation	Designation	RA (2000.0) Dec.	Magnitude	Separation/ Remarks
104 AQR	h 5413	23 42 −17 49	4.9, 7.7	120″
CAS	β pm	23 43 +58 05	7.1, 9.6, 9.6, 9.3, 9.6, 9.2	107,″ 120,″ 170,″ 160,″ 225″
PEG	O Σ 504	23 43 +18 40	7.4, 10.2	8″
ω-2 AQR	β 279	23 43 −14 33	4.5, 10.5	6″
AND	Σ 3034	23 44 +46 23	7.7, 9.9	6″
78 PEG	AGC 14	23 44 +29 22	5.1, 8.1	0.8″
SCL	h 5417	23 44 −26 15	6.3, 9.4	8″
CAS	Σ 3037	23 46 +60 28	7.4, 9.2, 9.5	2.6,″ 40″
107 AQR	H II 24	23 46 −18 41	5.7, 6.5	7″
PEG	Σ 3039	23 47 +28 25	7.4, 9.8	33″
AND	β 995	23 48 +46 50	6.1, 8.1	0.7″
20 PSC	S 835	23 48 −02 46	5.5, 9.9	170″
CAS	O Σ 507	23 49 +64 53	6.8, 7.8, 8.6	0.7,″ 50″
6 CAS	O Σ 508	23 49 +62 13	5.7, 8.0	1.4″
δ SCL	h 3216	23 49 −28 08	4.6, 9.4	75″
AND	h 1911	23 52 +42 05	7.4, 9.4	22″
AND	Σ 3042	23 52 +37 53	7.6, 7.8	6″
PEG	Σ 3044	23 53 +11 55	7.3, 7.9	20″
CAS	O ΣΣ 251	23 54 +51 31	7.0, 9.4	44″
SCL	Lal 192	23 54 −27 03	6.8, 7.4	6″
PEG	O ΣΣ 252	23 55 +29 29	6.8, 8.4	111″
AND	O Σ 513	23 58 +35 01	6.8, 9.3	4″
PEG	h 321	23 58 +11 28	6.6, 10.3	21″
σ CAS	Σ 3049	23 59 +55 45	5.0, 7.2	3″
AND	Σ 3050	23 59 +33 43	6.5, 6.7	2.0″