

# **A Simple Guide to Backyard Astronomy Using Binoculars or a Small Telescope**

**Assembled by Carol Beigel**

## **Where and When to Go Look at the Stars**

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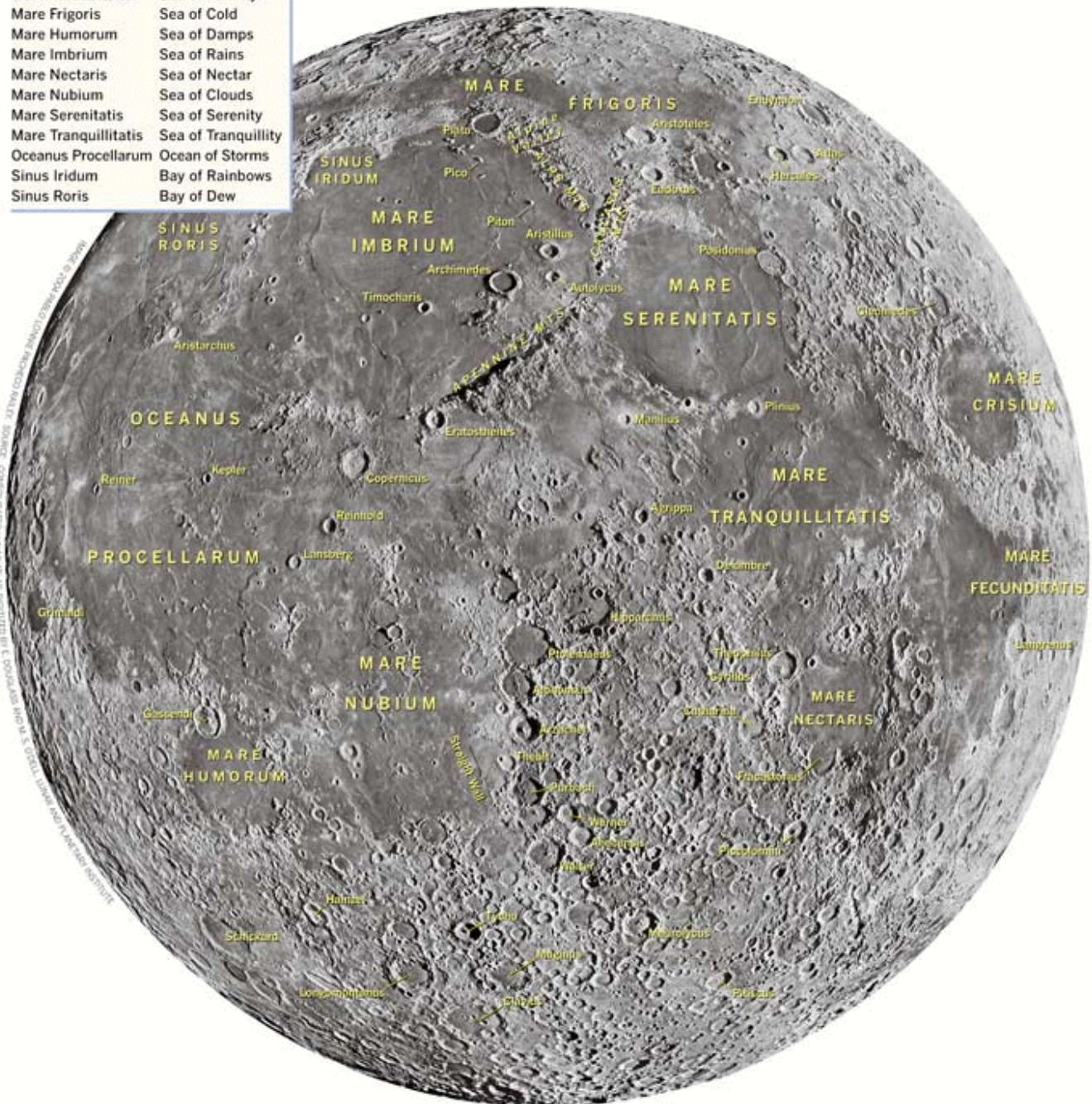
#### **Charts to Get Oriented in the Sky**

#### **Messier Objects**

#### **Thumbnail Photographs of Messier Objects**

## Names of Lunar Maria

Mare Crisium	Sea of Crises
Mare Fecunditatis	Sea of Fertility
Mare Frigoris	Sea of Cold
Mare Humorum	Sea of Damps
Mare Imbrium	Sea of Rains
Mare Nectaris	Sea of Nectar
Mare Nubium	Sea of Clouds
Mare Serenitatis	Sea of Serenity
Mare Tranquillitatis	Sea of Tranquillity
Oceanus Procellarum	Ocean of Storms
Sinus Iridum	Bay of Rainbows
Sinus Roris	Bay of Dew



## The Earth's Moon

Moon Map courtesy of Night Sky Magazine <http://skytonight.com/nightsky>  
<http://www.skyandtelescope.com/nightsky>



# A Simple Guide to Backyard Astronomy using Binoculars or a Small Telescope

assembled by Carol Beigel in the Summer of 2007

The wonderment of the night sky is a passion that must be shared. Tracking the phases of the Moon, if only to plan how much light it will put into the sky at night, and bookmarking the Clear Sky Clock, affectionately known as the Cloud Clock become as common as breathing. The best observing nights fall about a week after the Full Moon until a few days after the New Moon. However, don't wait for ideal and see what you can see every night no matter where you are. I offer this simple guide to anyone who wants to look upward and behold the magnificence of the night sky.

Light pollution complicates observing the night sky if you live near a city as the brightness of the sky will determine how much you will be able to see. Star gazing in the Washington D.C. area can be a wonderful experience in your own backyard or an incredibly fantastic experience if you are willing to drive 2 to 8 hours to find a dark sky. For more information about curbing light pollution and saving money at the same time, or to see a light pollution map, check out [www.starrynightlights.com/lpindex.html](http://www.starrynightlights.com/lpindex.html)

**All it takes to get started is a lawn chair and a pair of binoculars** Then you will want to know where to look for beautiful things in the sky, and how to know where you have pointed your optics Soon you will want something to hold the binoculars steady, bigger binoculars, a more comfortable lounge chair, warmer clothes and something to keep the dew off your optics Then..... well, Pandora's Box has opened, and you realize that aperture is everything, the cost of mounting the optics and accessorizing them far exceeds the cost of the optics themselves, and you are starting to wonder how nice a gift you need to buy for your spouse so that you can acquire a new piece of astro stuff.

## Where and When to Go to look at the Stars

Your backyard is a good place to start Most local astronomy clubs have public outreach programs and advertise public viewing nights. Here is a list of local astronomy clubs in the Washington, D.C. area.

**Northern Virginia Astronomy Club (NOVAC)** <http://www.novac.com/>

Howard Astronomical League (HAL) <http://www.howardastro.org/>  
Astronomical Society of Greenbelt <http://www.greenbeltastro.org/>  
University of Maryland, College Park, Public Astronomy Programs  
<http://www.astro.umd.edu/openhouse/index.html>  
Southern Maryland Astronomical Society (SMAS) <http://www.smas.us/>

The finest website ever to check out the condition of the sky and locations for observing is the **Clear Sky Clock** at <http://www.cleardarksky.com/csk/>.

If you like camping, try attending a star party. Even if you don't own a telescope, star parties are fun to attend. People with big and small, homemade or expensive telescopes are happy to show them off and let you take a look. They are great opportunities to see and try things before you buy. Some of the ones I am familiar with are listed below, but there are wonderful star parties all over the country:

**The Mason-Dixon Star Party** near Lancaster, PA usually in June or July  
**Stargaze** in the Spring, and the **No-Frills** in the Fall at Tuckahoe State Park, MD sponsored by the Delmarva Stargazers club

**Almost Heaven Star party** in August at the Mountain Institute on Spruce Knob, in West Virginia

**The Black Forest Star Party** in Cherry Springs, PA in September

## Dress for the Occasion!

Always carry a jacket, hat and boots. The cosmos is a very, very cold place, and it just sucks the warmth right out of you in the absence of sunlight. By day, the sun can be intense and burn your skin. A daytime, safari-style hat with a broad brim and covers the back of your neck, though no fashion statement, will help protect your face and neck from getting sunburned. Sun screen, lip balm, moisturizing lotion and insect repellent are four things you do not want to be without in the middle of nowhere! **Even in summer, most**

**astronomers battle cold temperatures at night!** Changing the clothes next to your skin at dusk, wearing wool socks and a hat that covers your ears will go a long way to keeping you comfortable. Dew can be a problem and soaks through clothing, so water resistant outerwear is a good idea. A pair of gloves comes in handy when the dew freezes on your equipment. Wearing a hat will help keep your feet warm as fifty percent of your body heat escapes from the top of your head. If you find that insulated boots are too bulky, try a pair of NEOS Overshoes. They fit over your regular shoes, are very light weight, pack flat, and keep your feet warm and dry in water, mud, frost and snow.



<http://www.overshoe.com/recreational/products/>

## Red Flashlight

A flashlight that shines a red and not a white light is essential for navigating your way around in the dark on the observing field and reading the star charts. You can either cover a flashlight you have with rubylith, a red cellophane, or buy one with a red LED bulb. Many clubs that sponsor public outreach programs will be able to provide you with red cellophane for your flash light when you arrive. I have come to prefer the kind of light you wear around your head so your hands are free. I really like my **Petzl Tactikka Plus LED**

**Headlamp** I bought at REI. It has a red plastic cover that comes down over the white light and has 3 different levels of brightness and adjustment angles.



**WHY RED?** Human eyes adapt to the dark by dilating the pupils and filling up with a chemical called visual purple. A white light will cause immediate pain and take your eyes another 30 minutes to readjust to the dark. A red light does not cause the visual purple to disappear or cause howling among the astrophotographers trying to take pictures.

<http://www.rei.com/product/709063>

## How to Find Things in the Sky (and figure out what you are looking at!)

There are many maps of the sky available. The selection is overwhelming, so I will name my favorites. Photographs on the covers of astronomy books and maps are spectacular, but you will NOT see those objects in that beautifully illustrated way in a small telescope or with a pair of binoculars. You also will not be able to see the color shown in these photographs, so don't be disappointed at the outset!

I own two bookshelves full of atlases and star charts, yet I cannot read them in the dark with a red flashlight because the print is too small and/or they cram so many objects on the chart that you can't tell where they are. Many of the charts included in this guide will be ones I created for myself and are specifically limited to large, bright objects you can see with a small telescope or binoculars. Most of the objects can be seen to some degree with the naked eye in a dark sky, and many of them can be found using optics in the horribly light polluted skies here in the Washington, D.C. area!

Most amateur astronomers use a combination of charts and gizmos to assist them in finding celestial objects. There is even software that can be used on a laptop computer or Pocket PC that will guide you or a telescope to targets you choose. Many new telescopes come with "Go-To" motors and software built into them or something like Sky Commander can be used with large Dobsonian telescopes to find and track objects in the sky.

## Planetarium Software

Planetarium programs can be installed on a computer that will show you what is available for viewing at anytime - both past and future. Most of my favorites are available for free on the web.

**Hallo Northern Sky** at: <http://www.hnsky.org/software.htm>

**WinStars 1.0** at <http://site.voila.fr/winstars/english/index2.html>

**Cartes du Ciel** at [www.stargazing.net/astropc/](http://www.stargazing.net/astropc/)

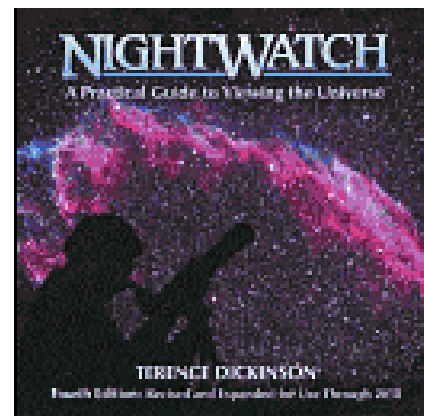
**The Sky Tonight** at [www.skytonight.com](http://www.skytonight.com)

**Pocket Sky** runs on a pocket pc, but is not free, and can be purchased at <http://www.bisque.com/Products/TheSkyPE/TheSkyPE.asp>

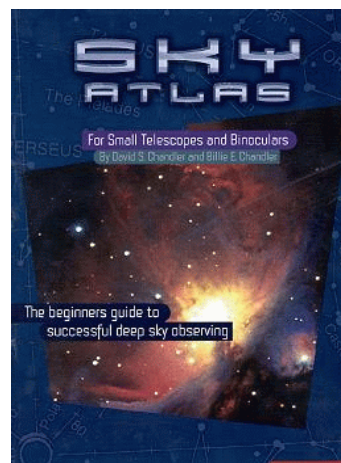
**The What's Up Page** on the Orion Telescope website Learning Center at <http://www.telescope.com/content/inthesky/>

## Books and Planispheres

If you were to buy only one book on astronomy, I would very highly recommend **NIGHTWATCH, A Practical Guide to Viewing the Universe (Fourth Edition)** written by Terence Dickinson (\$35). It is large enough to easily see the maps and charts in the dark, and is spiral bound. The photographs are astounding, but do remember they are probably stacked (composites of several photographs) and edited to display different wavelengths of light (color) that small optics will not show you. Make sure you buy the Fourth Edition as it just came out and has been revised and expanded to use through 2018.

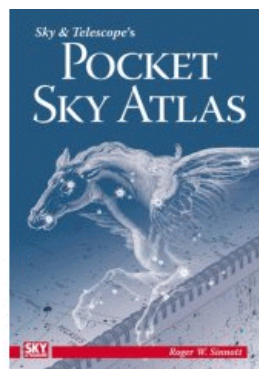


**The Night Sky Planisphere** published by David Chandler easy to use and has the least distortion of the constellation images. You can order one specifically for your latitude. Mine is the 30-40 degree one You rotate the wheel until it points to the day and time, and it shows you what is visible in the sky The Northern horizon is on the front side, and you simply turn it over to see the Southern horizon.



Both **The Night Sky Planisphere** and the **Sky Atlas for Small Telescopes** are published by David Chandler at [www.davidchandler.com](http://www.davidchandler.com).

**Binocular Highlights: 99 Celestial Sites** by George Seronik is available at <http://www.telescope.com>. Sky and Telescope magazine's **Pocket Sky Atlas** by Roger Sinnott is one of the best of all time and is available at [www.amazon.com](http://www.amazon.com). I keep my copy in the car along with the Canon IS binoculars so I never leave home without them!



Of course, my absolute favorite star charts are the ones I made for myself and included later in this guide. They are designed with light pollution factored in so that only the brightest stars are shown on the charts. All 93 objects can be viewed using binoculars and/or a small telescope.



## GIZMOS

Red dot pointing devices mounted on binoculars , cameras or telescopes work very well. A **Rigel finder** stands up a little higher and gives our face a little more room to aim the scope. You can aim the red dots at a specific point in the sky, then look through your scope. If everything is lined up properly, the object you seek will be centered in the eye piece..



A stand-alone "star finder" is the new **Celestron Sky Scout**. Not only does it have a lighted display that is more or less possible to read in the dark, it can also talk to you if you use the ear buds that come along with it. It works by turning on its GPS and gets a lock on several satellites. Then you can point it to any area of the sky, day or night, and it will tell you what object you are looking at. You can even ask it to find something for you, and more of the lights will blink on the display the closer you get. I bought mine at Hands On Optics in Damascus, Maryland. It was really nice to go into the store and play with one before I bought it! The unit does NOT like being close to metal objects, so it cannot be mounted to either a binocular or telescope mount.

Meade has a similar product made of plastic called the mySKY, however the picture is misleading because you will NOT see that beautiful galaxy in the window! I have not tried this device.



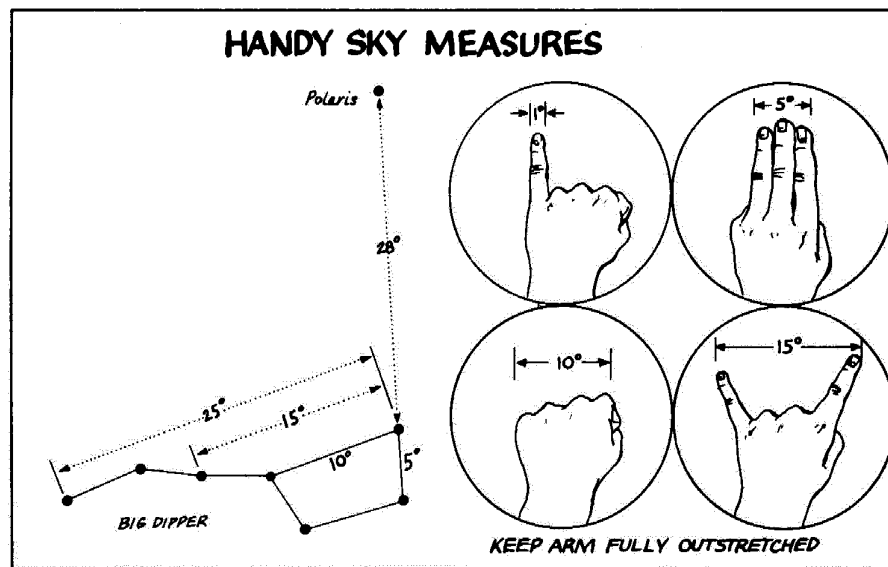


## Binoculars for Astronomy

Many large deep sky objects look better in binoculars than in a telescope due to their larger field of view. **Although any pair will do, bigger binoculars gather more light than smaller ones.** Larger binoculars (15x70 and larger) should be mounted because it is hard to keep the image steady whereas smaller models are easily hand held. There are also “image stabilizer” models that keep the target from moving.

Because the pupils of the eyes dilate in the dark, **binoculars for night use need larger exit pupils** ratings than binoculars that will **only** be used in daylight. The exit pupil is simply the objective (front /larger) lens diameter divided by the magnification (the smaller lenses next to your eyes). A pair of 10x50 binoculars would have an exit pupil of 5; 10x30s have a 3; 8x56s have an exit pupil of 7. The larger the exit pupil, the brighter the target image will appear.

In general, **a larger field of view is better**, but more magnification reduces field of view so the observer needs to balance the factors. A telescope may have a view of only 1 degree, but many objects in the night sky are much larger and can only be seen in their entirety with binoculars. It is like the difference between viewing something the size of your fingertip versus the size of your hand at arm's length. Another very important consideration is whether the binoculars will be used with or without eyeglasses. For use with eyeglasses, more "eye relief" is needed. Long eye relief generally is at least 18 mm.



(Drawing is from page 7 of the Edmund Sky Atlas, 1977)

There are two types of **prisms** used in binoculars: porro and roof. Porro prism binoculars cost less. "BaK-4" (barium crown) glass is better quality than "BK-7" although the latter is not necessarily bad. **Coatings are used to focus the different wavelengths of light to a single point to minimize color aberrations and halo effects.** "Fully multi-coated" is best. Roof prism binoculars are better if they are also "phase coated".

**The Canon 10x30 IS** (image stabilized) are my very favorite pair of binoculars. They are extremely light weight, and are the only handheld pair I use. They have a similar field of view and brightness as regular 10x50s.



The older **Celestron Giants 20x80s** were made with Japanese optics are the very best large binoculars I have ever used. Although they are no longer made (original price was \$400) used pairs may become available. I fasten them to a parallelogram mount attached to a surveyor's tripod. On a dark sky, I can see nebulas very well - especially using only one nebula filter fastened to one eyepiece. The current models with the same name are made differently and I cannot speak for their quality.

This photo shows the Steady View mount and a red dot finder mounted above the binoculars.



One of my favorite binocular mounts is the **Couch Potato Telescope Chair**. It is made to handle mounting of small and medium sized binoculars up to 15x70 lightweight models. The entire assembly folds flat and easily fits into a car. It offers a 360 degree rotation and good height adjustments. You can buy it already assembled, or buy it in kit form, or just buy the plans and make it yourself. The chair is made by Sim Picheloup in Houston, Texas. His website is:  
<http://www.geocities.com/lwraif/SimP/>



## Telescopes for Back Yard Astronomy

**The best telescope is the one you use all the time.** The telescope tube is the least expensive item of the set-up once you consider eye pieces and mounting the thing. Bigger and heavier is always better, but as you get older, weight will become more of a consideration than money. Depending on the construction of the telescope, the image you see is usually upside down, and/or reversed left to right. A roof prism, although not necessary, will correct the position of the image. A spotting scope gives you an image that is realistically oriented.

There is an extensive selection of telescopes available in every conceivable price range - reflectors, refractors, Dobsonians, Schmidt-Cassegrains, and Maksutovs. They all do different things and it all comes down to personal preference and what you want to look at. You can even buy telescopes for only a few hundred dollars that have GOTO computers attached to them that will point themselves to whatever you want to look at in the sky. There are endless focal length specifications and eyepieces. **Many decisions and trade-offs need to be balanced in selecting a telescope as no one model meets all needs.** Since I have had access to many of them, I will list my favorite small telescopes as follows.

The **AstroScan** from Edmund Scientific is the nearly indestructible telescope I purchased for my grandchildren. There is a good review of it at <http://www.dansdata.com/astroscan.htm> Mine is the \$199 version purchased online at [www.scientificsonline.com](http://www.scientificsonline.com) . It also comes with The Edmund Sky Guide, a great little book to help you find things in the sky, 2 eye pieces, and a finder attachment that works surprisingly well. It is lightweight and easily fits in your lap, can sit on a table, or can be mounted on a tripod.



The **Yukon 6x100x100 Spotting Scope** is very light weight and versatile. It has built in zoom and the eyepiece can be easily rotated to different angles. I mount mine on a **Carl Zeiss tripod**. Both the scope and the tripod are in the \$350 price range. **Don't waste your money on anything less than a Carl Zeiss tripod!!!** The website for the spotting scope is:

<http://www.yukonamericas.com/index.asp>

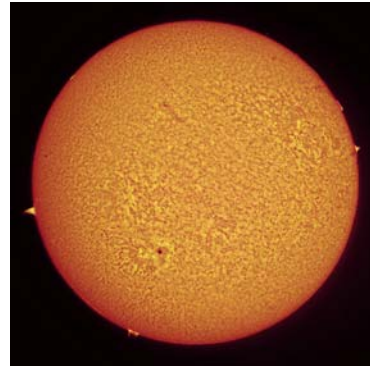


The **Celestron NexStar 4SE** has high-quality Maksutov-Cassegrain optics with Celestron's premium StarBright XLT coatings. It weighs 21 lbs including the tripod, is ultra portable and features a precision optical system with 1,325 mm focal length (f/13) with a 105 mm (4-inch) mirror. This means it has a much narrower field of view than the above telescopes, but can see much fainter objects in light polluted skies. It gives very good detail on the planets. It is also completely computer-controlled (GoTo) and sets up in minutes. The database has 40,000 objects. The first time I set up mine, I simply leveled the included tripod, adjusted the included red dot finder, pointed it to one bright object in the sky (Jupiter) and told it I was near Washington, D.C. It could find anything! It comes with everything included that you need, and costs about \$600.





The Coronado Personal Solar Telescope (PST) is the specialized little telescope that has only one purpose - viewing the sun! **NEVER, NEVER point any other optics directly at the sun without special filters!!!** You will fry your eyes and your optics! You can see solar storms on the surface of the sun which appear as black sunspots when viewed head-on, or prominences, pictured below, when viewed at an angle. Sunspot activity is indicative of solar flare activity that causes the Northern Lights (Aurora Borealis). You can see predictions of aurora activity at: [www.spaceweather.com](http://www.spaceweather.com)



**LOMO 6" Maksutov Telescope.** This is a short tube telescope with Russian optics mounted to a fork mount on a heavy duty tripod. The wedge attached to the tripod enables the scope to "track", follow the rotation of the earth, when a small, 9-volt battery operated servo motor is connected. This way the object in focus does not move out of view. Both the telescope and fork mount are made of steel. Because this set-up is very heavy I think twice before taking it anywhere. However, it has extremely sharp images and doesn't move in a strong wind! The tent in the picture is a Kendrick observing tent. Kendrick also makes very good dew zapper equipment. <http://www.kendrickastro.com/astro.html> The telescope tube looks longer in this photo because the dew shield is attached to the end.



## Star Charts

Most star charts I have seen are cluttered with too many objects in a small space for me to be able to read in the dark with a red flashlight, so I made my own charts using the Deep Space Astro Card software. The darker the sky, the more objects you will be able to see. You know when you are looking at a dark sky when the clouds appear black instead of white! Of course, the bigger the telescope the more detail you can see!

The **planets** always travel the same path through the sky, called the **Ecliptic**. The constellations located along this path are known as the Zodiac. You can always check the almanac data in the newspaper to find which planets are visible and when. While stars focus to a point of light, planets focus to a solid object. **Venus** can only be seen in the morning and evening, and **Jupiter** and **Saturn** can be seen during the night as well as evening and morning depending upon where they are in their orbits around the sun. Often, these very bright objects are miscalled the Morning or Evening Stars. **Mars** is visible only every 2 years and looks red. You can tell if you are looking at **Jupiter** because you can usually see at least 3 little moons near it. **Saturn**, with its rings, is the most impressive object in the sky next to the **moon**!

Only two **double stars** are included on this list of objects, but the sky is full of them. Two easy ones to see with a small telescope are **Mizar** in the handle Big Dipper and **Albireo** in the constellation Cygnus. **My charts contain Open Clusters, Globular Clusters, Nebulas and Galaxies.** Because galaxies are so diffuse they are hard to see in light polluted skies. You need a larger telescope to see most of them, however, the closest one, the **Andromeda Galaxy**, is best viewed with binoculars. Galaxies can only be seen when looking out of the plane of our own Milky Way Galaxy which appears as a narrow, bright celestial cloud spread across the sky. The Open Clusters will also be best viewed in binoculars. Globular clusters and nebulas will appear as "faint fuzzies" in the sky.

## List of 93 Treasured Objects in the Sky

This a list of 93 things you can see in the sky with a small telescope or pair of binoculars and 15 star charts to help you find them. The moon, planets, and comets are NOT included because they are in different places each night. The chart also includes a map key to assist you in finding these treasures. There is a column that lists each object's magnitude - the lower the number the brighter the object. Under light -polluted skies, or nights when the moonlight is bright, you may only be able to see Mag 4 or less. The right ascension (RA ) is when an object rises in the East with smaller numbers rising earlier. The Declination shows the degrees the object is located North (+) to South (-) of the celestial equator. Some objects are best viewed in binoculars because they are so large.

**Good Binocular Objects** - These objects are included in my list of 93.

### **Nebulas**

Orion Nebula, M42

Nebulas in Sagittarius, The Lagoon (M8), the Trifid (M20), the Swan (M17), Eagle (M16)

The North American Nebula, NGC 7000 in Cygnus

The Dumbell Nebula (M27) in Vulpecula

The Helix Nebula, NGC 7293 near Aquarius

### **Open Star Clusters**

The Peiades, M45

The Hyades in Taurus

The Alpha Persei Group in Perseus

The Double Cluster in Perseus

The Coma Cluster in Coma Berenices

The Beehive (Praesepe, M44) in Cancer

M6 and M7 above the tail of Scorpius

### **Globular Clusters (look like fuzzy balls in binoculars as do comets)**

M13 and M92 in Hercules

M22 in Sagittarius

Omega Centauri in Centaurus - only visible here in March and April

### **Galaxies**

The Andromeda Galaxy, M31 - look between Cassiopeia and Pegasus

The Triangulum Galaxy, M33

### **Star Chains**

Kemble's Cascade in Camelopardus (between the North Star and the Double Cluster in Perseus)

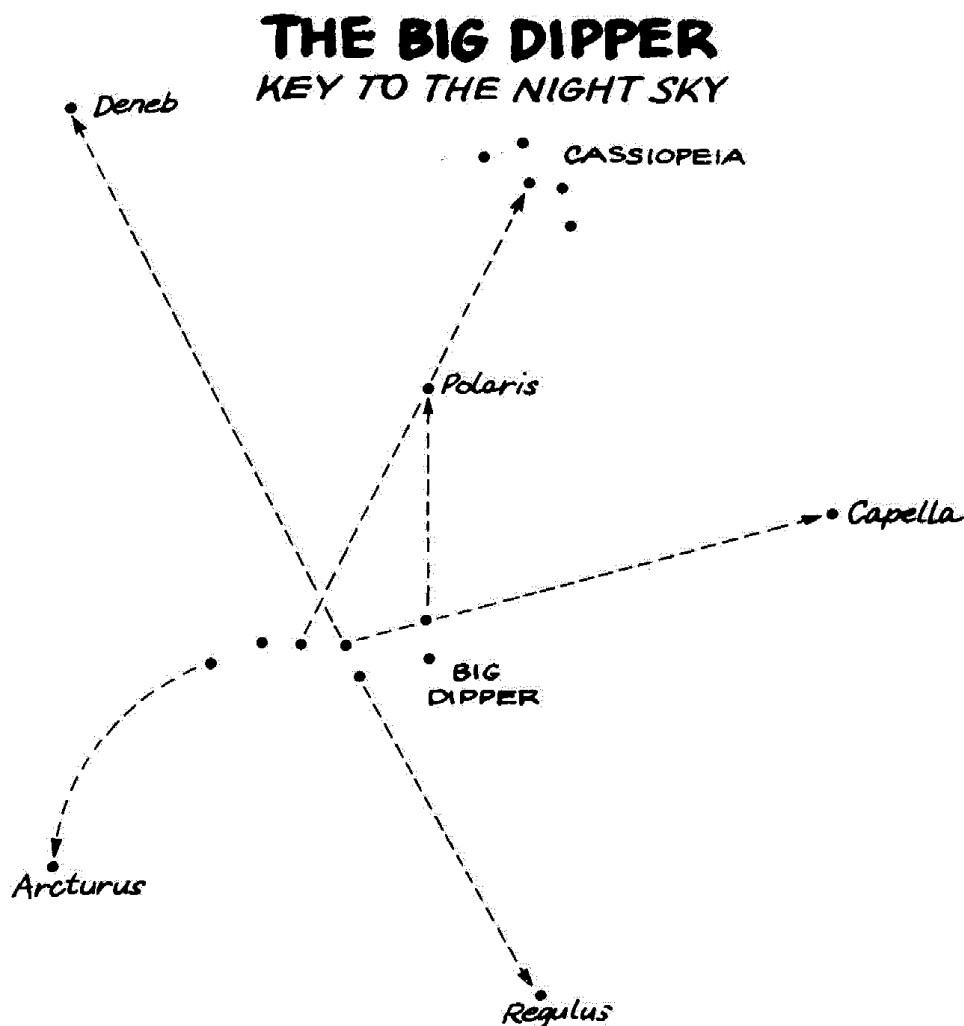
## **Messier Charts**

Charles Messier (1730-1817) was a French astronomer, and along with his friend, Pierre Mechain, compiled a list of 103 "faint fuzzies" they observed with small telescopes over the skies of Paris. Comet hunting was a very popular pastime back then, and since comets also appear as "faint fuzzies" in the sky, Messier compiled this list so they would not be mistaken for comets. Many of these objects are included in the 93 Objects Charts and Maps.

## **Messier Object Thumbnail Photographs**

These are extremely beautiful photos; probably taken by the Hubble and others who know how to do this. Astrophotography is a Pandora's Box all unto its own. You will NOT be able to see these beautiful colors through a small telescope, however using a Nebula filter, you will be able to see some nebulosity as green.

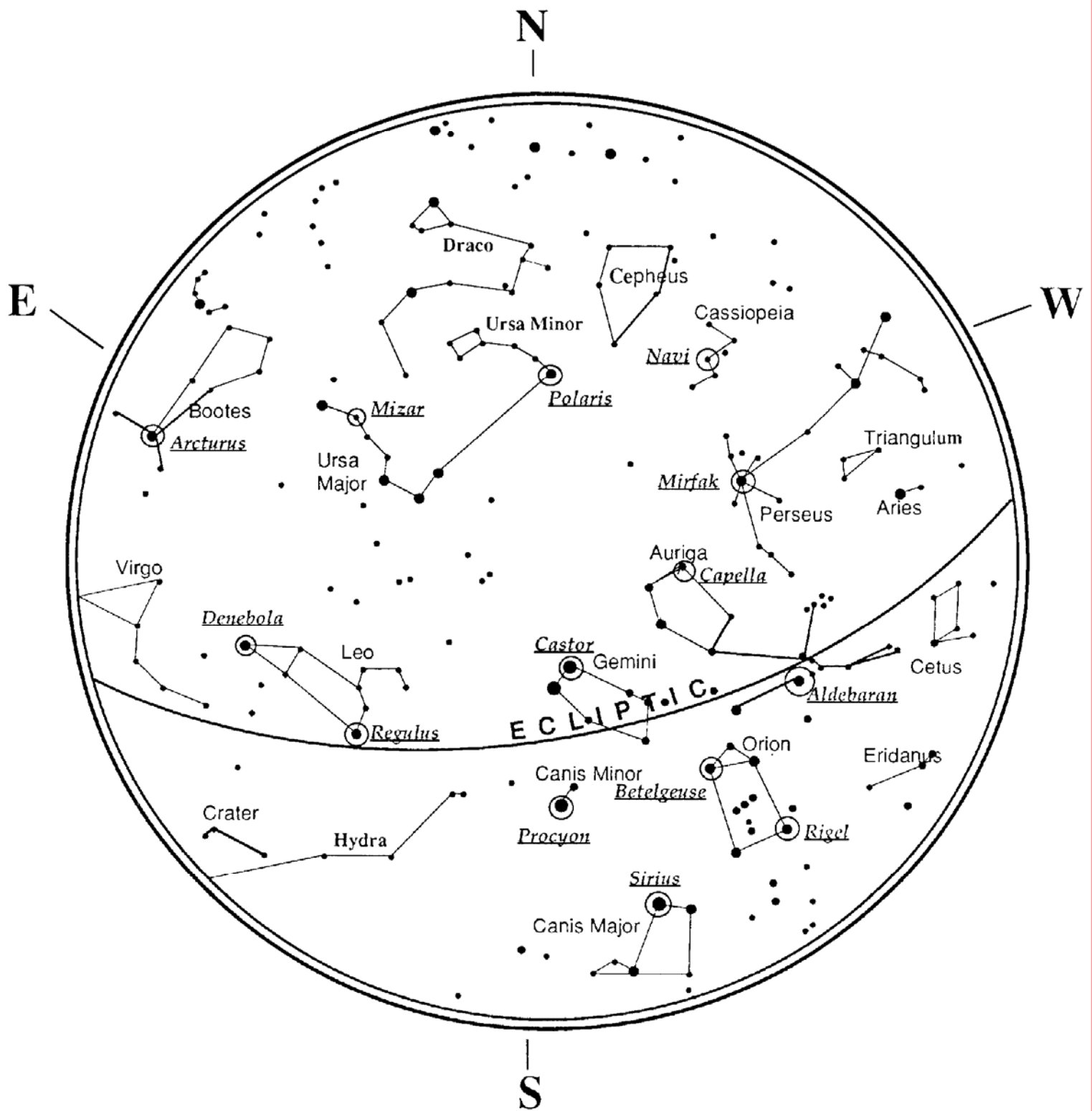
This chart from p.7 of the Edmund Sky Guide can help you get oriented. to the sky from just about anywhere in the Northern Hemisphere. The charts that follow showing the sky through the seasons were distributed by Celestron at their website [www.celestron.com](http://www.celestron.com)



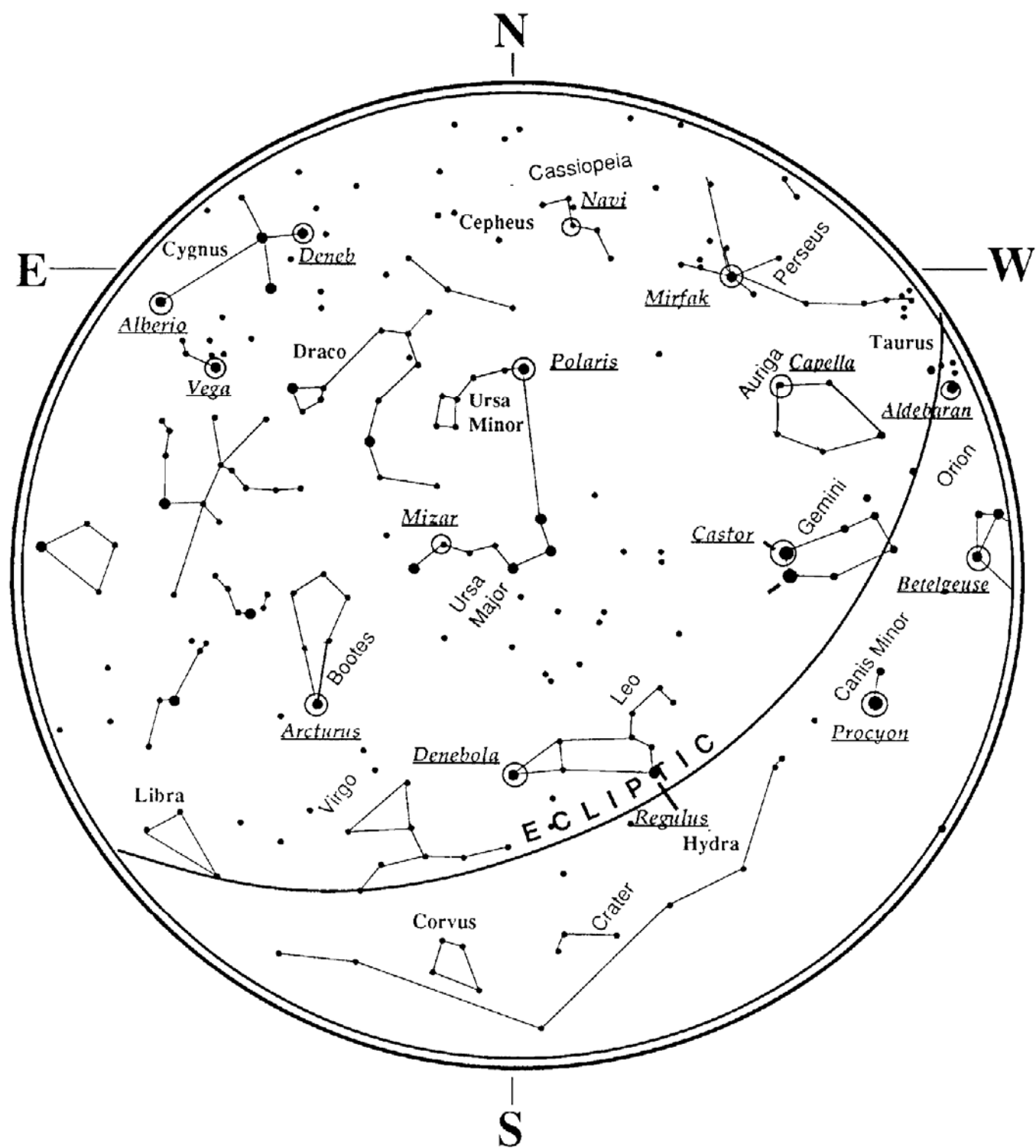
By some cosmic coincidence the Big Dipper stars are arranged so that they conveniently point at most of the major bright stars in the sky. This diagram can be used at any time of any night of the year because the stars do not change their positions relative to one another. What does change is the direction that you face into space due to Earth's rotation and revolution. This means that although the Dipper itself will always be visible (if you live north of 38° north latitude) not all of the stars that are indicated in this diagram will be above the horizon at any one time. Once you have identified some of the major guide stars you can then turn to the appropriate connecting map on the following pages to continue your sky exploring.



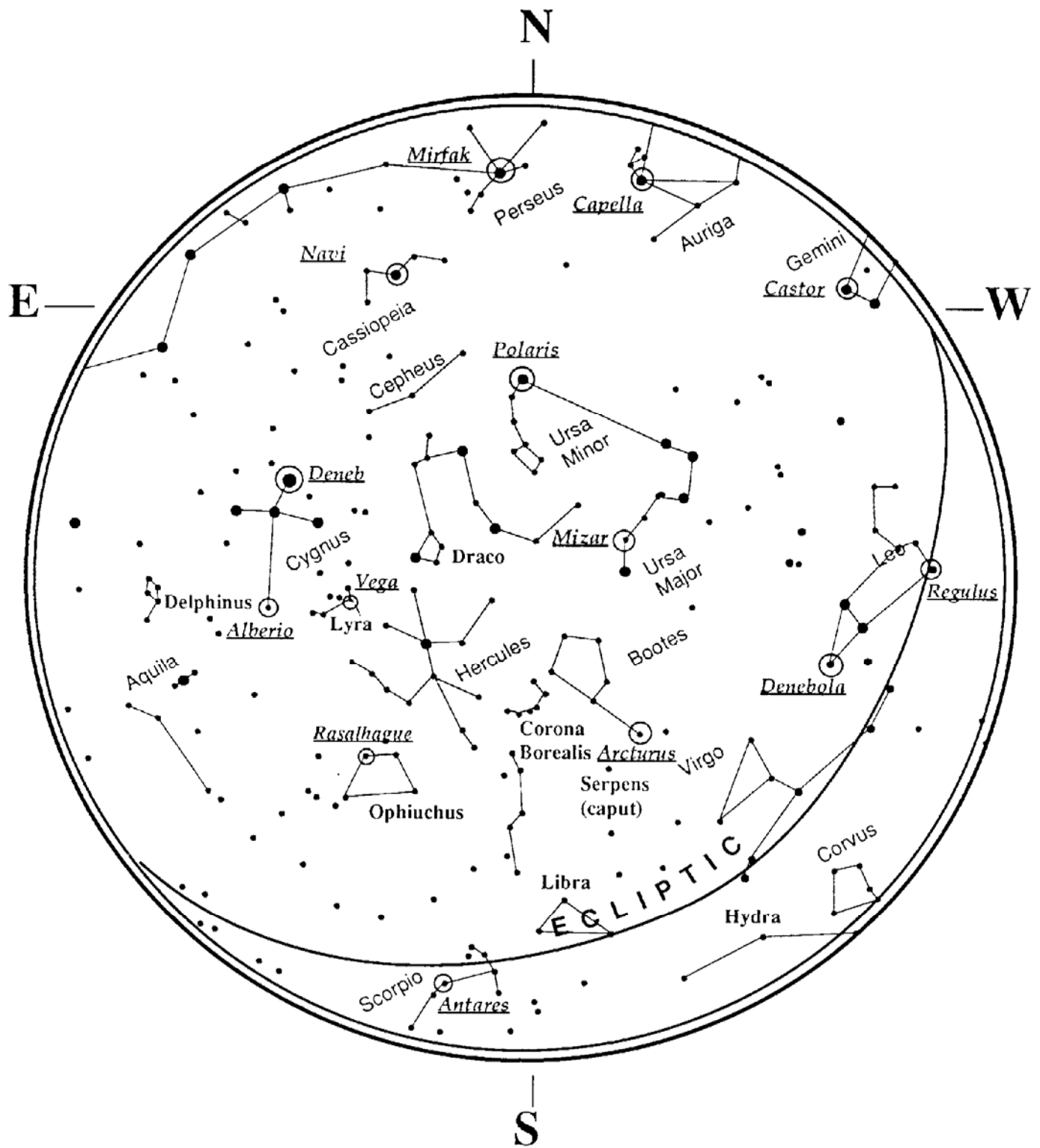
# January - February Sky



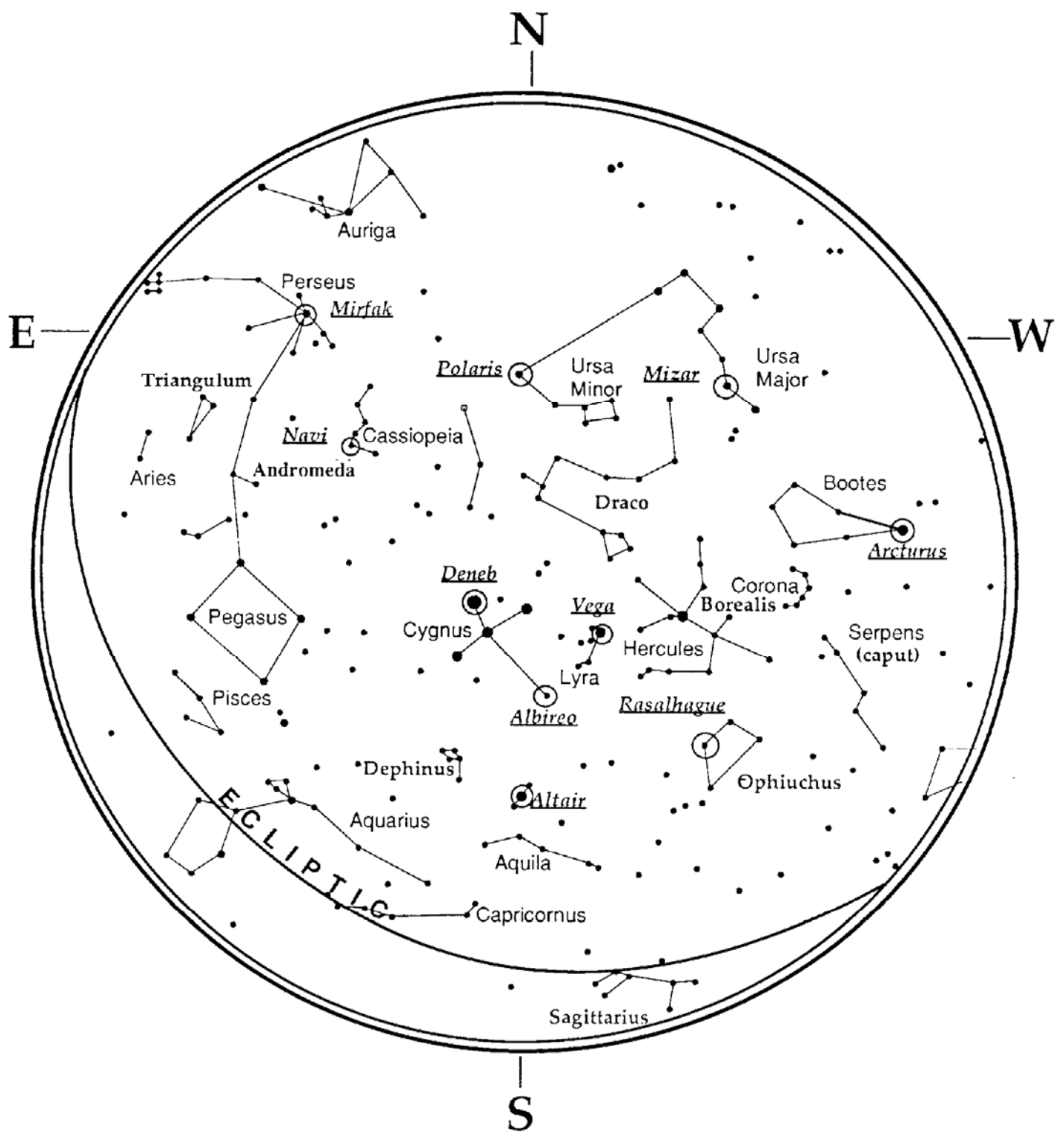
# March - April Sky



# May - June Sky

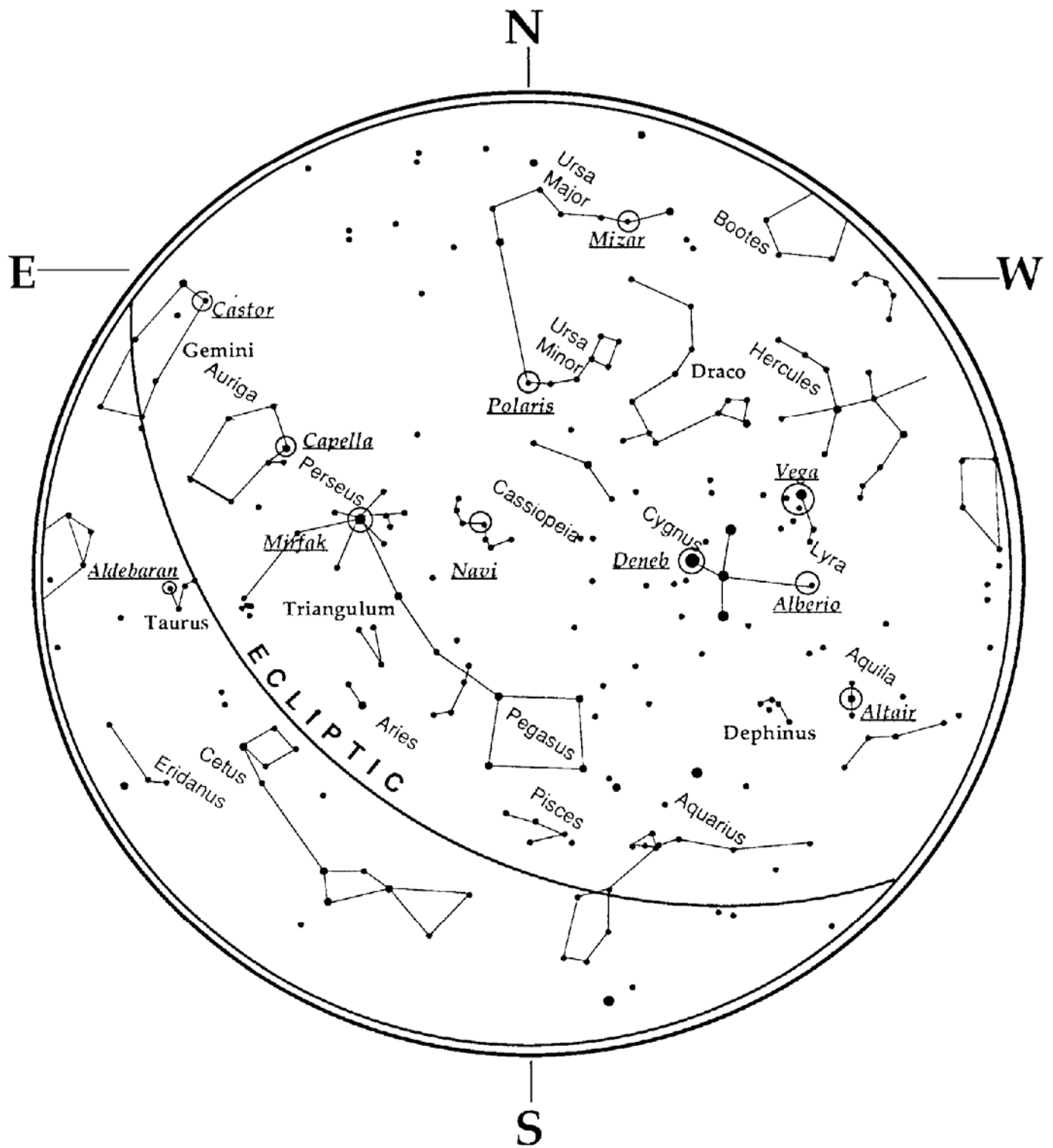


# July - August Sky

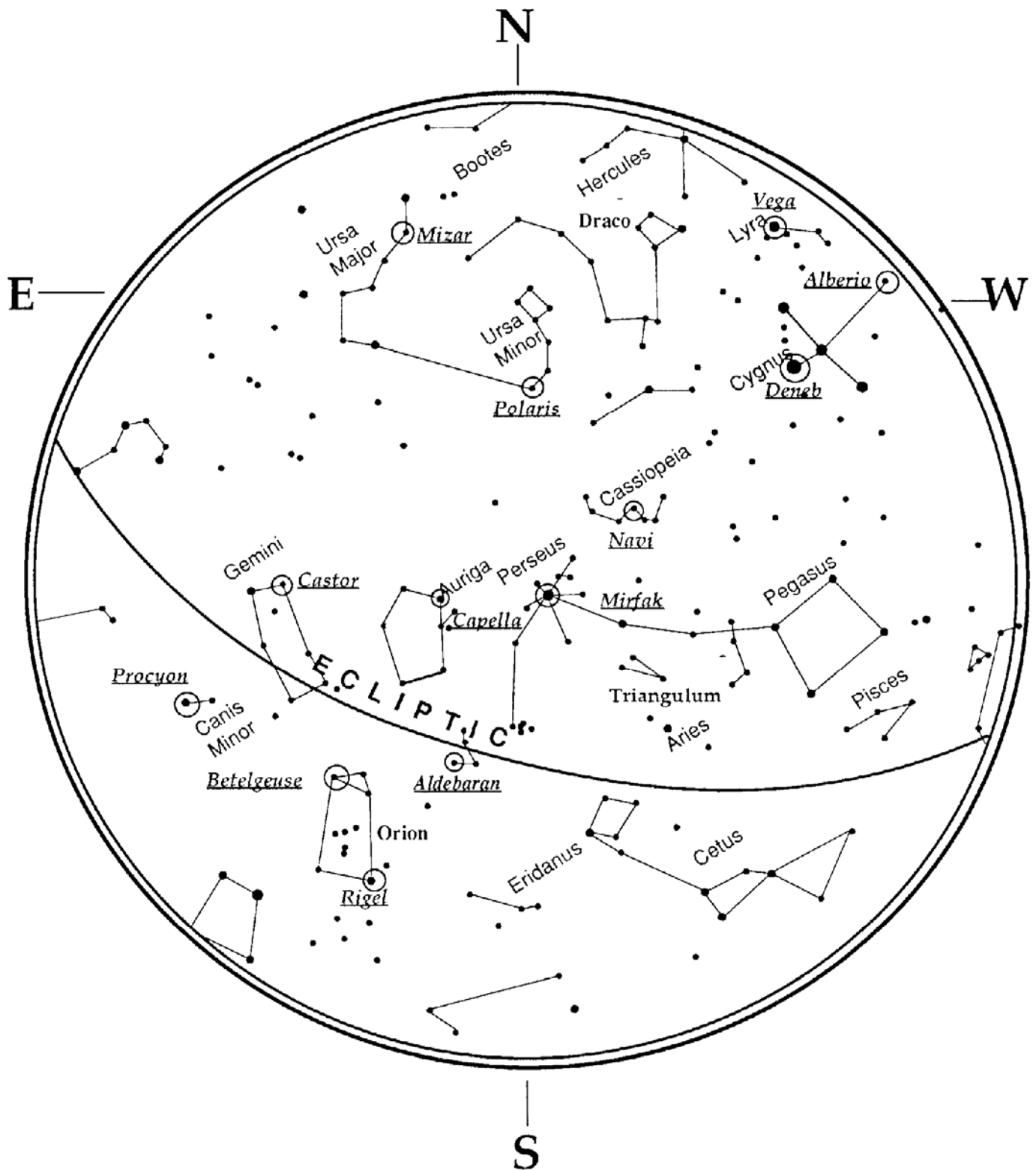




# September - October Sky



# November - December Sky



## CB93 Best Objects in the Sky for Small Telescopes and Binoculars sorted by Constellation

Object Id	Other Id	Type	R.A.	Decl.	Const	Mag 1	Description
NGC 224	M31 - Andromeda Galaxy	Gx	00 42 42.0	+41 16 00.0	And	3.40	CB93 Map 1 largest object in the sky
NGC 7089	M2	Gb	21 33 30.0	-00 49 00.0	Aqr	6.50	CB93 Map 2
NGC 2099	M37 - Auriga Salt-and-Pepper Cluster	OC	05 52 18.0	+32 33 00.0	Aur	5.60	CB93 Map 3
NGC 1960	M36 - Pinwheel Cluster	OC	05 36 18.0	+34 08 00.0	Aur	6.00	CB93 Map 3
NGC 1912	M38 - Starfish Cluster	OC	05 28 42.0	+35 51 00.0	Aur	6.40	CB93 Map 3
NGC 1502	Kemble's Cascade	OC	04 07 48.0	+62 20 00.0	Cam	6.90	CB93 Map 4
NGC 457	Dragonfly Cluster	OC	01 19 30.0	+58 17 00.0	Cas	6.40	CB93 Map 1
NGC 581	M103	OC	01 33 24.0	+60 39 00.0	Cas	7.40	CB93 Map 1 and 4
Stock 2		OC	02 15 00.0	+59 16 00.0	Cas	4.40	CB93 Map 1
NGC 2287	M41- Little Beehive	OC	06 46 00.0	-20 45 00.0	CMa	4.50	CB93 Map 5
NGC 2632	M44 - Praesepe, Beehive Cluster	OC	08 40 00.0	+19 40 00.0	Cnc	3.10	CB93 Map 5
NGC 2682	M67- King Cobra	OC	08 50 48.0	+11 49 00.0	Cnc	6.90	CB93 Map 5
NGC 4254	M99 - Coma PinWheel Galaxy	Gx	12 18 48.0	+14 25 00.0	Com	9.90	CB93 Map 6
NGC 5024	M53	Gb	13 12 54.0	+18 10 00.0	Com	7.70	CB93 Map 6
Mel 111	Berenice's Hair	OC	12 25 00.0	+26 00 00.0	Com	1.80	CB93 Map 6
NGC 4192	M98	Gx	12 13 48.0	+14 54 00.0	Com	10.10	CB93 Map 6
NGC 4826	M64 - Black-Eye Galaxy	Gx	12 56 42.0	+21 41 00.0	Com	8.50	CB93 Map 6
NGC 4501	M88 - Markarian's Chain	Gx	12 32 00.0	+14 25 00.0	Com	9.60	CB93 Map 6
NGC 4736	M94 - Croc's Eye	Gx	12 50 54.0	+41 07 00.0	CVn	8.20	CB93 Map 7 and 15
NGC 5272	M3	Gb	13 42 12.0	+28 23 00.0	CVn	6.40	CB93 Map 6
NGC 5055	M63 - Sunflower Galaxy	Gx	13 15 48.0	+42 02 00.0	CVn	8.60	CB93 Map 7 and 15
NGC 7092	M39	OC	21 32 12.0	+48 26 00.0	Cyg	4.60	CB93 Map 1 and 8
NGC 7000	North American Nebula	Nb	21 01 48.0	+44 12 00.0	Cyg	4.00	CB93 Map 8
NGC 6913	M29 - Cooling Tower	OC	20 23 54.0	+38 32 00.0	Cyg	6.60	CB93 Map 8
NGC 2168	M35	OC	06 08 12.0	+24 22 00.0	Gem	5.10	CB93 Map 3
NGC 6205	M13 - Great Hercules Cluster	Gb	16 41 42.0	+36 28 00.0	Her	5.90	CB93 Map 7 and 15
NGC 6341	M92	Gb	17 17 06.0	+43 08 00.0	Her	6.50	CB93 Map 7 and 15
NGC 4590	M68	Gb	12 39 30.0	-26 45 00.0	Hya	8.20	CB93 Map 9
NGC 5236	M83 - Southern Pinwheel	Gx	13 37 00.0	-29 52 00.0	Hya	7.50	CB93 Map 9
NGC 2548	M48	OC	08 13 42.0	-05 45 00.0	Hya	5.80	CB93 Map 5
NGC 3351	M95	Gx	10 44 00.0	+11 42 00.0	Leo	9.70	CB93 Map 10
NGC 3368	M96	Gx	10 46 48.0	+11 49 00.0	Leo	9.30	CB93 Map 10

## CB93 Best Objects in the Sky for Small Telescopes and Binoculars sorted by Constellation

Object Id	Other Id	Type	R.A.	Decl.	Const	Mag 1	Description
NGC 3623	M65 - in the Leo Triplet	Gx	11 18 54.0	+13 05 00.0	Leo	9.30	CB93 Map 6 and 10
NGC 3627	M66 - in the Leo Triplet	Gx	11 20 12.0	+13 00 00.0	Leo	8.90	CB93 Map 6 and 10
NGC 6779	M56	Gb	19 16 36.0	+30 11 00.0	Lyr	8.30	CB93 Map 8
NGC 6720	M57 - Ring Nebula	Pl	18 53 36.0	+33 02 00.0	Lyr	9.40	CB93 Map 8
NGC 2323	M50 - Heart-Shaped Cluster	OC	07 02 30.0	-08 23 00.0	Mon	5.90	CB93 Map 5
NGC 2264	Christmas Tree Cluster	C+N	06 41 00.0	+09 54 00.0	Mon	3.90	CB93 Map 5
NGC 6333	M9	Gb	17 19 12.0	-18 31 00.0	Oph	7.90	CB93 Map 11 and 12
NGC 6254	M10	Gb	16 57 06.0	-04 06 00.0	Oph	6.60	CB93 Map 11
NGC 6171	M107	Gb	16 32 30.0	-13 03 00.0	Oph	8.10	CB93 Map 11
NGC 6273	M19	Gb	17 02 36.0	-26 16 00.0	Oph	7.20	CB93 Map 11 and 12
NGC 6402	M14	Gb	17 37 36.0	-03 15 00.0	Oph	7.60	CB93 Map 11
NGC 6218	M12 - Gumball Cluster	Gb	16 47 12.0	-01 57 00.0	Oph	6.60	CB93 Map 11
NGC 6266	M62- Flickering Globular	Gb	17 01 12.0	-30 07 00.0	Oph	6.60	CB93 Map 12
NGC 1976	M42 - Great Orion Nebula	C+N	05 35 18.0	-05 23 00.0	Ori	4.00	CB93 Map 5
NGC 7078	M15 - Great Pegasus Cluster	Gb	21 30 00.0	+12 10 00.0	Peg	6.40	CB93 Map 2
NGC 1039	M34 - Spiral Cluster	OC	02 42 06.0	+42 47 00.0	Per	5.20	CB93 Map 1
NGC 869	Double Cluster in Perseus	OC	02 19 06.0	+57 08 00.0	Per	5.30	CB93 Map 1 and 4
Mel 20	Cr 39	OC	03 22 00.0	+49 00 00.0	Per	1.20	CB93 Map 1 use binoculars
NGC 2422	M47	OC	07 36 36.0	-14 29 00.0	Pup	4.40	CB93 Map 5
NGC 2477	OCL 720	OC	07 52 12.0	-38 32 00.0	Pup	5.80	CB93 Map 5
NGC 2447	M93 - Butterfly Cluster	OC	07 44 30.0	-23 51 00.0	Pup	6.20	CB93 Map 5
NGC 6121	M4 - Cat's Eye	Gb	16 23 36.0	-26 32 00.0	Sco	5.90	CB93 Map 11 and 12
NGC 6475	M7 - Scorpions Tail	OC	17 53 54.0	-34 48 00.0	Sco	3.30	CB93 Map 12
NGC 6124	Dunlop 514	OC	16 25 18.0	-40 39 00.0	Sco	5.80	CB93 Map 12
NGC 6405	M6 - Butterfly Cluster	OC	17 40 18.0	-32 15 00.0	Sco	4.20	CB93 Map 12
Cr 316	False Comet	OC	16 55 30.0	-40 50 00.0	Sco	3.40	CB93 Map 12
NGC 6093	M80	Gb	16 17 00.0	-22 59 00.0	Sco	7.20	CB93 Map 12
NGC 6705	M11 - Wild Duck Cluster	OC	18 51 06.0	-06 16 00.0	Sct	5.80	CB93 Map 2, 11 and 14
NGC 6694	M26	OC	18 45 12.0	-09 24 00.0	Sct	8.00	CB93 Map 2, 11 and 14
NGC 5904	M5	Gb	15 18 36.0	+02 05 00.0	Ser	5.80	CB93 Map 11
NGC 6611	M16 - Eagle Nebula	C+N	18 18 48.0	-13 47 00.0	Ser	6.00	CB93 Map 11 and 14
NGC 6523	M8 - Lagoon Nebula	C+N	18 03 42.0	-24 23 00.0	Sgr	5.00	CB93 Map 13 and 14



## CB93 Best Objects in the Sky for Small Telescopes and Binoculars sorted by Constellation

Object Id	Other Id	Type	R.A.	Decl.	Const	Mag 1	Description
IC 4715	M24 - Sagittarius Star Cloud	OC	18 26 36.0	-18 23 00.0	Sgr	3.10	CB93 Map 14
NGC 6626	M28	Gb	18 24 30.0	-24 52 00.0	Sgr	6.90	CB93 Map 13 and 14
NGC 6809	M55- The Spectre	Gb	19 40 00.0	-30 58 00.0	Sgr	7.00	CB93Map 13 and 14
NGC 6618	M17 - Swan Nebula	C+N	18 20 48.0	-16 11 00.0	Sgr	6.00	CB93 Map 11 and 14 no stars, looks like checkmark
NGC 6715	M54	Gb	18 55 06.0	-30 29 00.0	Sgr	7.70	CB93 Map 13 and 14
NGC 6656	M22 - Great Sagittarius Cluster	Gb	18 36 24.0	-23 54 00.0	Sgr	5.10	CB93 Map 12 and 13 one of finest globs
NGC 6494	M23	OC	17 57 06.0	-18 59 00.0	Sgr	5.50	CB93 Map 14
NGC 6637	M69	Gb	18 31 24.0	-32 21 00.0	Sgr	7.70	CB93 Map 13 and 14
NGC 6681	M70	Gb	18 43 12.0	-32 18 00.0	Sgr	8.10	CB93 Map 13 and 14
NGC 6864	M75	Gb	20 06 06.0	-21 55 00.0	Sgr	8.60	CB93 Map 14
NGC 6514	M20 - Trifid Nebula	C+N	18 02 42.0	-22 58 00.0	Sgr	6.30	CB93 Map 11
NGC 6531	M21	OC	18 04 12.0	-22 29 00.0	Sgr	5.90	CB93 Map 14
IC 4725	M25	OC	18 31 48.0	-19 07 00.0	Sgr	4.60	CB93 Map 14
NGC 6613	M18 - Black Swan	OC	18 19 54.0	-17 08 00.0	Sgr	6.90	CB93 Map 11 and 14
Mel 25	Hyades	OC	04 27 00.0	+16 00 00.0	Tau	0.50	CB93 Map 3 and 5
Mel 22	M45 - Pleiades	C+N	03 47 00.0	+24 07 00.0	Tau	1.20	CB93 Map 1 and 3
NGC 598	M33 - Pinwheel Galaxy	Gx	01 33 54.0	+30 39 00.0	Tri	5.70	CB93 Map 1
NGC 3034	M82 - Cigar Galaxy	Gx	09 55 54.0	+69 41 00.0	UMa	8.40	CB93 Map 4 and 15
NGC 5457	M101 - Pinwheel Galaxy	Gx	14 03 12.0	+54 21 00.0	UMa	7.90	CB93 Map 15
NGC 3587	M97 - Owl Nebula	Pl	11 14 48.0	+55 01 00.0	UMa	11.00	CB93 Map 15
NGC 3031	M81 - Bode's Nebula	Gx	09 55 36.0	+69 04 00.0	UMa	6.90	CB93 Map 4 and 15
NGC 4552	M89	Gx	12 35 42.0	+12 33 00.0	Vir	9.80	CB93 Map 6
NGC 4569	M90	Gx	12 36 48.0	+13 10 00.0	Vir	9.50	CB93 Map 6
NGC 4406	M86 - Markarian's chain	Gx	12 26 12.0	+12 57 00.0	Vir	8.90	CB93 Map 6
NGC 4374	M84 - Markarian's Chain	Gx	12 25 06.0	+12 53 00.0	Vir	9.10	CB93 Map 6
NGC 4486	M87 - Virgo A	Gx	12 30 48.0	+12 23 00.0	Vir	8.60	CB93 Map 6
NGC 4594	M104 - Sombrero Galaxy	Gx	12 40 00.0	-11 37 00.0	Vir	8.00	CB93 Map 9
Cr 399	Coathanger cluster	OC	19 25 24.0	+20 11 00.0	Vul	3.60	CB93 Map 2 and 8 easy naked eye
NGC 6853	M27 - Dumbbell Nebula	Pl	19 59 36.0	+22 43 00.0	Vul	7.30	CB93 Map 2 and 8

## CB93 Best Objects in the Sky for Small Telescopes and Binoculars - sorted by Right Ascension (R.A.)

Object Id	Other Id	Type	R.A.	Decl.	Const	Mag 1	Description
NGC 224	M31 - Andromeda Galaxy	Gx	00 42 42.0	+41 16 00.0	And	3.40	CB93 Map 1 largest object in the sky
NGC 457	Dragonfly Cluster	OC	01 19 30.0	+58 17 00.0	Cas	6.40	CB93 Map 1
NGC 581	M103	OC	01 33 24.0	+60 39 00.0	Cas	7.40	CB93 Map 1 and 4
NGC 598	M33 - Pinwheel Galaxy	Gx	01 33 54.0	+30 39 00.0	Tri	5.70	CB93 Map 1
Stock 2		OC	02 15 00.0	+59 16 00.0	Cas	4.40	CB93 Map 1
NGC 869	Double Cluster in Perseus	OC	02 19 06.0	+57 08 00.0	Per	5.30	CB93 Map 1 and 4
NGC 1039	M34 - Spiral Cluster	OC	02 42 06.0	+42 47 00.0	Per	5.20	CB93 Map 1
Mel 20	Cr 39	OC	03 22 00.0	+49 00 00.0	Per	1.20	CB93 Map 1 use binoculars
Mel 22	M45 - Pleiades	C+N	03 47 00.0	+24 07 00.0	Tau	1.20	CB93 Map 1 and 3
NGC 1502	Kemble's Cascade	OC	04 07 48.0	+62 20 00.0	Cam	6.90	CB93 Map 4
Mel 25	Hyades	OC	04 27 00.0	+16 00 00.0	Tau	0.50	CB93 Map 3 and 5
NGC 1912	M38 - Starfish Cluster	OC	05 28 42.0	+35 51 00.0	Aur	6.40	CB93 Map 3
NGC 1976	M42 - Great Orion Nebula	C+N	05 35 18.0	-05 23 00.0	Ori	4.00	CB93 Map 5
NGC 1960	M36 - Pinwheel Cluster	OC	05 36 18.0	+34 08 00.0	Aur	6.00	CB93 Map 3
NGC 2099	M37 - Auriga Salt-and-Pepper Cluster	OC	05 52 18.0	+32 33 00.0	Aur	5.60	CB93 Map 3
NGC 2168	M35	OC	06 08 12.0	+24 22 00.0	Gem	5.10	CB93 Map 3
NGC 2264	Christmas Tree Cluster	C+N	06 41 00.0	+09 54 00.0	Mon	3.90	CB93 Map 5
NGC 2287	M41- Little Beehive	OC	06 46 00.0	-20 45 00.0	CMa	4.50	CB93 Map 5
NGC 2323	M50 - Heart-Shaped Cluster	OC	07 02 30.0	-08 23 00.0	Mon	5.90	CB93 Map 5
NGC 2422	M47	OC	07 36 36.0	-14 29 00.0	Pup	4.40	CB93 Map 5
NGC 2447	M93 - Butterfly Cluster	OC	07 44 30.0	-23 51 00.0	Pup	6.20	CB93 Map 5
NGC 2477	OCL 720	OC	07 52 12.0	-38 32 00.0	Pup	5.80	CB93 Map 5
NGC 2548	M48	OC	08 13 42.0	-05 45 00.0	Hya	5.80	CB93 Map 5
NGC 2632	M44 - Praesepe, Beehive Cluster	OC	08 40 00.0	+19 40 00.0	Cnc	3.10	CB93 Map 5
NGC 2682	M67- King Cobra	OC	08 50 48.0	+11 49 00.0	Cnc	6.90	CB93 Map 5
NGC 3031	M81 - Bode's Nebula	Gx	09 55 36.0	+69 04 00.0	UMa	6.90	CB93 Map 4 and 15
NGC 3034	M82 - Cigar Galaxy	Gx	09 55 54.0	+69 41 00.0	UMa	8.40	CB93 Map 4 and 15
NGC 3351	M95	Gx	10 44 00.0	+11 42 00.0	Leo	9.70	CB93 Map 10
NGC 3368	M96	Gx	10 46 48.0	+11 49 00.0	Leo	9.30	CB93 Map 10
NGC 3587	M97 - Owl Nebula	Pl	11 14 48.0	+55 01 00.0	UMa	11.00	CB93 Map 15
NGC 3623	M65 - in the Leo Triplet	Gx	11 18 54.0	+13 05 00.0	Leo	9.30	CB93 Map 6 and 10
NGC 3627	M66 - in the Leo Triplet	Gx	11 20 12.0	+13 00 00.0	Leo	8.90	CB93 Map 6 and 10

## CB93 Best Objects in the Sky for Small Telescopes and Binoculars - sorted by Right Ascension (R.A.)

Object Id	Other Id	Type	R.A.	Decl.	Const	Mag 1	Description
NGC 4192	M98	Gx	12 13 48.0	+14 54 00.0	Com	10.10	CB93 Map 6
NGC 4254	M99 - Coma PinWheel Galaxy	Gx	12 18 48.0	+14 25 00.0	Com	9.90	CB93 Map 6
Mel 111	Berenice's Hair	OC	12 25 00.0	+26 00 00.0	Com	1.80	CB93 Map 6
NGC 4374	M84 - Markarian's Chain	Gx	12 25 06.0	+12 53 00.0	Vir	9.10	CB93 Map 6
NGC 4406	M86 - Markarian's chain	Gx	12 26 12.0	+12 57 00.0	Vir	8.90	CB93 Map 6
NGC 4486	M87 - Virgo A	Gx	12 30 48.0	+12 23 00.0	Vir	8.60	CB93 Map 6
NGC 4501	M88 - Markarian's Chain	Gx	12 32 00.0	+14 25 00.0	Com	9.60	CB93 Map 6
NGC 4552	M89	Gx	12 35 42.0	+12 33 00.0	Vir	9.80	CB93 Map 6
NGC 4569	M90	Gx	12 36 48.0	+13 10 00.0	Vir	9.50	CB93 Map 6
NGC 4590	M68	Gb	12 39 30.0	-26 45 00.0	Hya	8.20	CB93 Map 9
NGC 4594	M104 - Sombrero Galaxy	Gx	12 40 00.0	-11 37 00.0	Vir	8.00	CB93 Map 9
NGC 4736	M94 - Croc's Eye	Gx	12 50 54.0	+41 07 00.0	CVn	8.20	CB93 Map 7 and 15
NGC 4826	M64 - Black-Eye Galaxy	Gx	12 56 42.0	+21 41 00.0	Com	8.50	CB93 Map 6
NGC 5024	M53	Gb	13 12 54.0	+18 10 00.0	Com	7.70	CB93 Map 6
NGC 5055	M63 - Sunflower Galaxy	Gx	13 15 48.0	+42 02 00.0	CVn	8.60	CB93 Map 7 and 15
NGC 5236	M83 - Southern Pinwheel	Gx	13 37 00.0	-29 52 00.0	Hya	7.50	CB93 Map 9
NGC 5272	M3	Gb	13 42 12.0	+28 23 00.0	CVn	6.40	CB93 Map 6
NGC 5457	M101 - Pinwheel Galaxy	Gx	14 03 12.0	+54 21 00.0	UMa	7.90	CB93 Map 15
NGC 5904	M5	Gb	15 18 36.0	+02 05 00.0	Ser	5.80	CB93 Map 11
NGC 6093	M80	Gb	16 17 00.0	-22 59 00.0	Sco	7.20	CB93 Map 12
NGC 6121	M4 - Cat's Eye	Gb	16 23 36.0	-26 32 00.0	Sco	5.90	CB93 Map 11 and 12
NGC 6124	Dunlop 514	OC	16 25 18.0	-40 39 00.0	Sco	5.80	CB93 Map 12
NGC 6171	M107	Gb	16 32 30.0	-13 03 00.0	Oph	8.10	CB93 Map 11
NGC 6205	M13 - Great Hercules Cluster	Gb	16 41 42.0	+36 28 00.0	Her	5.90	CB93 Map 7 and 15
NGC 6218	M12 - Gumball Cluster	Gb	16 47 12.0	-01 57 00.0	Oph	6.60	CB93 Map 11
Cr 316	False Comet	OC	16 55 30.0	-40 50 00.0	Sco	3.40	CB93 Map 12
NGC 6254	M10	Gb	16 57 06.0	-04 06 00.0	Oph	6.60	CB93 Map 11
NGC 6266	M62- Flickering Globular	Gb	17 01 12.0	-30 07 00.0	Oph	6.60	CB93 Map 12
NGC 6273	M19	Gb	17 02 36.0	-26 16 00.0	Oph	7.20	CB93 Map 11 and 12
NGC 6341	M92	Gb	17 17 06.0	+43 08 00.0	Her	6.50	CB93 Map 7 and 15
NGC 6333	M9	Gb	17 19 12.0	-18 31 00.0	Oph	7.90	CB93 Map 11 and 12
NGC 6402	M14	Gb	17 37 36.0	-03 15 00.0	Oph	7.60	CB93 Map 11

## CB93 Best Objects in the Sky for Small Telescopes and Binoculars - sorted by Right Ascension (R.A.)

Object Id	Other Id	Type	R.A.	Decl.	Const	Mag 1	Description
NGC 6405	M6 - Butterfly Cluster	OC	17 40 18.0	-32 15 00.0	Sco	4.20	CB93 Map 12
NGC 6475	M7 - Scorpions Tail	OC	17 53 54.0	-34 48 00.0	Sco	3.30	CB93 Map 12
NGC 6494	M23	OC	17 57 06.0	-18 59 00.0	Sgr	5.50	CB93 Map 14
NGC 6514	M20 - Trifid Nebula	C+N	18 02 42.0	-22 58 00.0	Sgr	6.30	CB93 Map 11
NGC 6523	M8 - Lagoon Nebula	C+N	18 03 42.0	-24 23 00.0	Sgr	5.00	CB93 Map 13 and 14
NGC 6531	M21	OC	18 04 12.0	-22 29 00.0	Sgr	5.90	CB93 Map 14
NGC 6611	M16 - Eagle Nebula	C+N	18 18 48.0	-13 47 00.0	Ser	6.00	CB93 Map 11 and 14
NGC 6613	M18 - Black Swan	OC	18 19 54.0	-17 08 00.0	Sgr	6.90	CB93 Map 11 and 14
NGC 6618	M17 - Swan Nebula	C+N	18 20 48.0	-16 11 00.0	Sgr	6.00	CB93 Map 11 and 14 no stars, looks like checkmark
NGC 6626	M28	Gb	18 24 30.0	-24 52 00.0	Sgr	6.90	CB93 Map 13 and 14
IC 4715	M24 - Sagittarius Star Cloud	OC	18 26 36.0	-18 23 00.0	Sgr	3.10	CB93 Map 14
NGC 6637	M69	Gb	18 31 24.0	-32 21 00.0	Sgr	7.70	CB93 Map 13 and 14
IC 4725	M25	OC	18 31 48.0	-19 07 00.0	Sgr	4.60	CB93 Map 14
NGC 6656	M22 - Great Sagittarius Cluster	Gb	18 36 24.0	-23 54 00.0	Sgr	5.10	CB93 Map 12 and 13 one of finest globs
NGC 6681	M70	Gb	18 43 12.0	-32 18 00.0	Sgr	8.10	CB93 Map 13 and 14
NGC 6694	M26	OC	18 45 12.0	-09 24 00.0	Sct	8.00	CB93 Map 2, 11 and 14
NGC 6705	M11 - Wild Duck Cluster	OC	18 51 06.0	-06 16 00.0	Sct	5.80	CB93 Map 2, 11 and 14
NGC 6720	M57 - Ring Nebula	Pl	18 53 36.0	+33 02 00.0	Lyr	9.40	CB93 Map 8
NGC 6715	M54	Gb	18 55 06.0	-30 29 00.0	Sgr	7.70	CB93 Map 13 and 14
NGC 6779	M56	Gb	19 16 36.0	+30 11 00.0	Lyr	8.30	CB93 Map 8
Cr 399	Coathanger cluster	OC	19 25 24.0	+20 11 00.0	Vul	3.60	CB93 Map 2 and 8 easy naked eye
NGC 6809	M55- The Spectre	Gb	19 40 00.0	-30 58 00.0	Sgr	7.00	CB93 Map 13 and 14
NGC 6853	M27 - Dumbbell Nebula	Pl	19 59 36.0	+22 43 00.0	Vul	7.30	CB93 Map 2 and 8
NGC 6864	M75	Gb	20 06 06.0	-21 55 00.0	Sgr	8.60	CB93 Map 14
NGC 6913	M29 - Cooling Tower	OC	20 23 54.0	+38 32 00.0	Cyg	6.60	CB93 Map 8
NGC 7000	North American Nebula	Nb	21 01 48.0	+44 12 00.0	Cyg	4.00	CB93 Map 8
NGC 7078	M15 - Great Pegasus Cluster	Gb	21 30 00.0	+12 10 00.0	Peg	6.40	CB93 Map 2
NGC 7092	M39	OC	21 32 12.0	+48 26 00.0	Cyg	4.60	CB93 Map 1 and 8
NGC 7089	M2	Gb	21 33 30.0	-00 49 00.0	Aqr	6.50	CB93 Map 2

# CB93 Best Objects in the Sky for Small Telescopes & Binoculars - sorted by Magnitude (lower numbers are brighter)

Object Id	Other Id	Type	R.A.	Decl.	Const	Mag 1	Description
Mel 25	Hyades	OC	04 27 00.0	+16 00 00.0	Tau	0.50	CB93 Map 3 and 5
Mel 20	Cr 39	OC	03 22 00.0	+49 00 00.0	Per	1.20	CB93 Map 1 use binoculars
Mel 22	M45 - Pleiades	C+N	03 47 00.0	+24 07 00.0	Tau	1.20	CB93 Map 1 and 3
Mel 111	Berenice's Hair	OC	12 25 00.0	+26 00 00.0	Com	1.80	CB93 Map 6
IC 4715	M24 - Sagittarius Star Cloud	OC	18 26 36.0	-18 23 00.0	Sgr	3.10	CB93 Map 14
NGC 2632	M44 - Praesepe, Beehive Cluster	OC	08 40 00.0	+19 40 00.0	Cnc	3.10	CB93 Map 5
NGC 6475	M7 - Scorpions Tail	OC	17 53 54.0	-34 48 00.0	Sco	3.30	CB93 Map 12
NGC 224	M31 - Andromeda Galaxy	Gx	00 42 42.0	+41 16 00.0	And	3.40	CB93 Map 1 largest object in the sky
Cr 316	False Comet	OC	16 55 30.0	-40 50 00.0	Sco	3.40	CB93 Map 12
Cr 399	Coathanger cluster	OC	19 25 24.0	+20 11 00.0	Vul	3.60	CB93 Map 2 and 8 easy naked eye
NGC 2264	Christmas Tree Cluster	C+N	06 41 00.0	+09 54 00.0	Mon	3.90	CB93 Map 5
NGC 7000	North American Nebula	Nb	21 01 48.0	+44 12 00.0	Cyg	4.00	CB93 Map 8
NGC 1976	M42 - Great Orion Nebula	C+N	05 35 18.0	-05 23 00.0	Ori	4.00	CB93 Map 5
NGC 6405	M6 - Butterfly Cluster	OC	17 40 18.0	-32 15 00.0	Sco	4.20	CB93 Map 12
Stock 2		OC	02 15 00.0	+59 16 00.0	Cas	4.40	CB93 Map 1
NGC 2422	M47	OC	07 36 36.0	-14 29 00.0	Pup	4.40	CB93 Map 5
NGC 2287	M41- Little Beehive	OC	06 46 00.0	-20 45 00.0	CMa	4.50	CB93 Map 5
NGC 7092	M39	OC	21 32 12.0	+48 26 00.0	Cyg	4.60	CB93 Map 1 and 8
IC 4725	M25	OC	18 31 48.0	-19 07 00.0	Sgr	4.60	CB93 Map 14
NGC 6523	M8 - Lagoon Nebula	C+N	18 03 42.0	-24 23 00.0	Sgr	5.00	CB93 Map13 and 14
NGC 2168	M35	OC	06 08 12.0	+24 22 00.0	Gem	5.10	CB93 Map 3
NGC 6656	M22 - Great Sagittarius Cluster	Gb	18 36 24.0	-23 54 00.0	Sgr	5.10	CB93 Map 12 and 13 one of finest globs
NGC 1039	M34 - Spiral Cluster	OC	02 42 06.0	+42 47 00.0	Per	5.20	CB93 Map 1
NGC 869	Double Cluster in Perseus	OC	02 19 06.0	+57 08 00.0	Per	5.30	CB93 Map 1 and 4
NGC 6494	M23	OC	17 57 06.0	-18 59 00.0	Sgr	5.50	CB93 Map 14
NGC 2099	M37 - Auriga Salt-and-Pepper Cluster	OC	05 52 18.0	+32 33 00.0	Aur	5.60	CB93 Map 3
NGC 598	M33 - Pinwheel Galaxy	Gx	01 33 54.0	+30 39 00.0	Tri	5.70	CB93 Map 1
NGC 2548	M48	OC	08 13 42.0	-05 45 00.0	Hya	5.80	CB93 Map 5
NGC 6705	M11 - Wild Duck Cluster	OC	18 51 06.0	-06 16 00.0	Sct	5.80	CB93 Map 2, 11 and 14
NGC 6124	Dunlop 514	OC	16 25 18.0	-40 39 00.0	Sco	5.80	CB93 Map 12
NGC 2477	OCL 720	OC	07 52 12.0	-38 32 00.0	Pup	5.80	CB93 Map 5
NGC 5904	M5	Gb	15 18 36.0	+02 05 00.0	Ser	5.80	CB93 Map 11

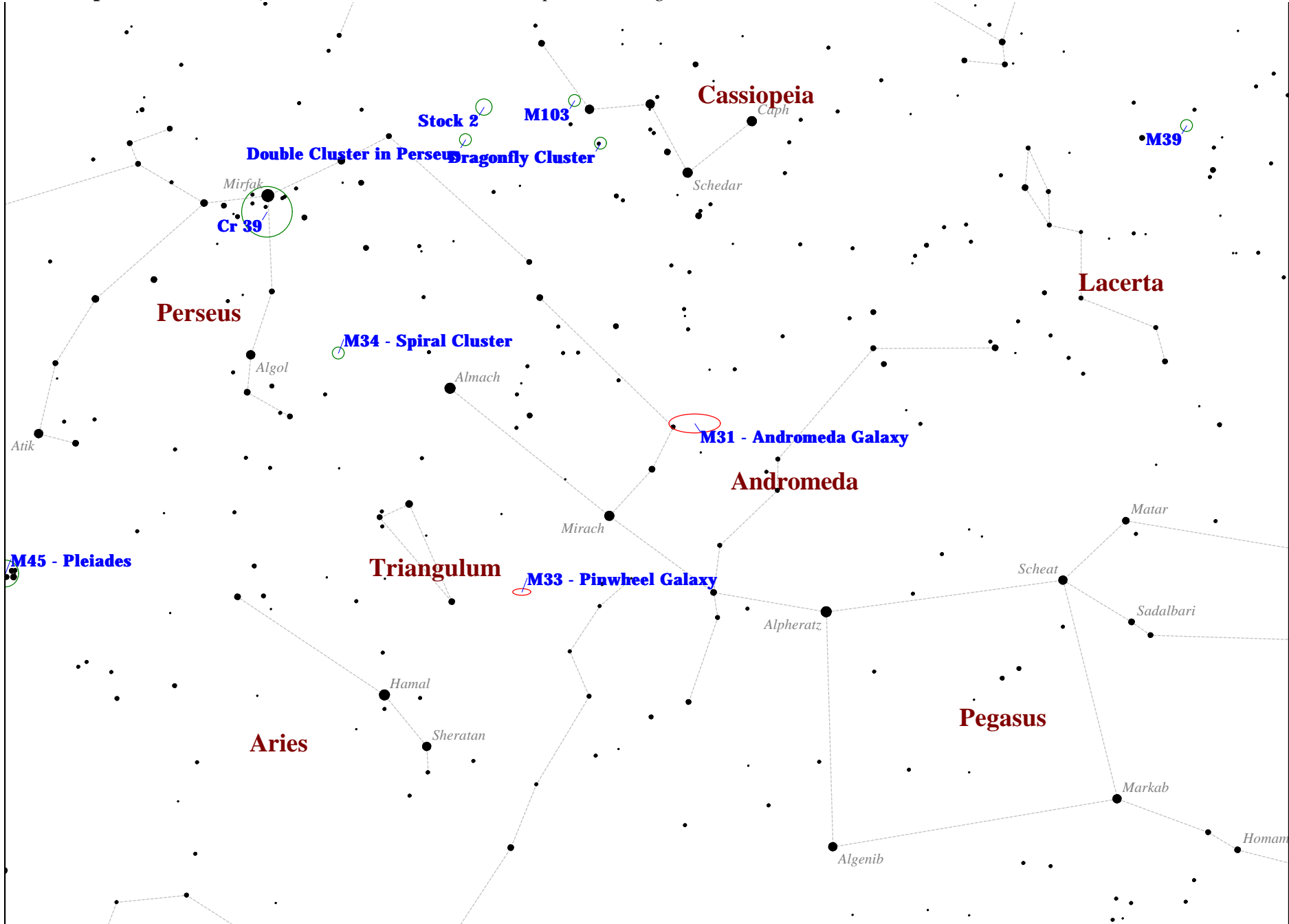


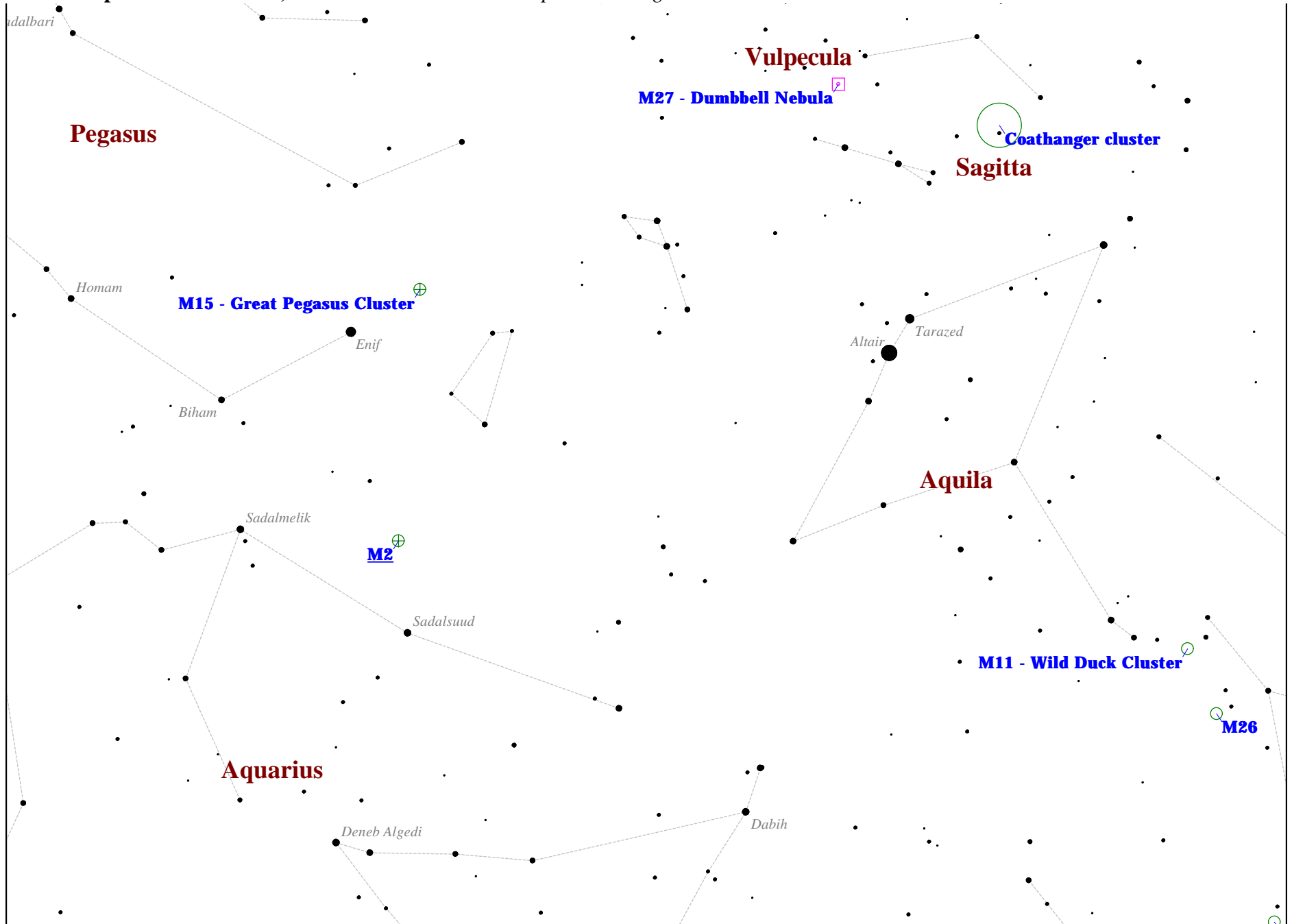
# CB93 Best Objects in the Sky for Small Telescopes and Binoculars - sorted by Magnitude (lower numbers are brighter)

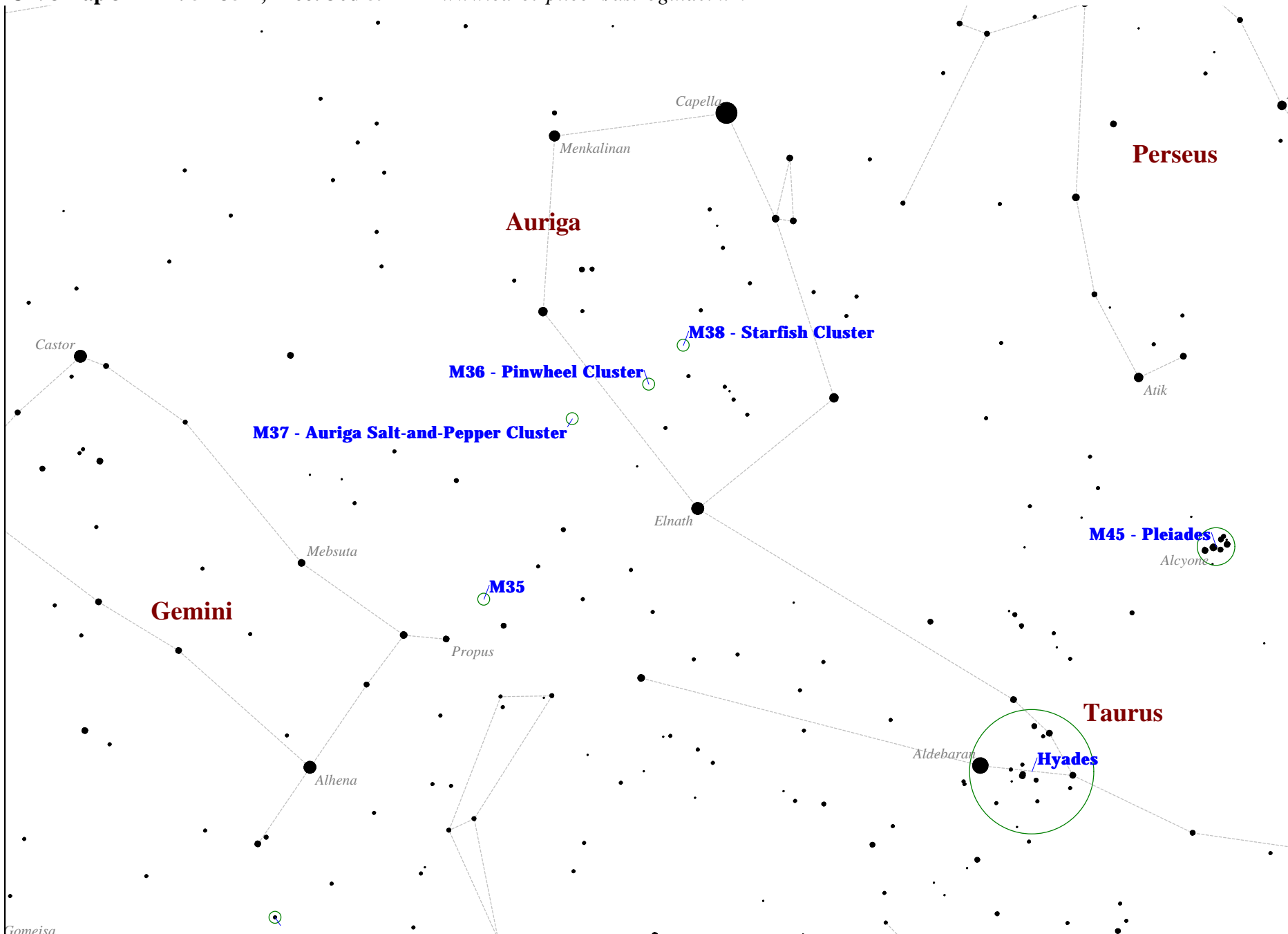
Object Id	Other Id	Type	R.A.	Decl.	Const	Mag 1	Description
NGC 2323	M50 - Heart-Shaped Cluster	OC	07 02 30.0	-08 23 00.0	Mon	5.90	CB93 Map 5
NGC 6205	M13 - Great Hercules Cluster	Gb	16 41 42.0	+36 28 00.0	Her	5.90	CB93 Map 7 and 15
NGC 6121	M4 - Cat's Eye	Gb	16 23 36.0	-26 32 00.0	Sco	5.90	CB93 Map 11 and 12
NGC 6531	M21	OC	18 04 12.0	-22 29 00.0	Sgr	5.90	CB93 Map 14
NGC 6618	M17 - Swan Nebula	C+N	18 20 48.0	-16 11 00.0	Sgr	6.00	CB93 Map 11 and 14 no stars, looks like checkmark
NGC 1960	M36 - Pinwheel Cluster	OC	05 36 18.0	+34 08 00.0	Aur	6.00	CB93 Map 3
NGC 6611	M16 - Eagle Nebula	C+N	18 18 48.0	-13 47 00.0	Ser	6.00	CB93 Map 11 and 14
NGC 2447	M93 - Butterfly Cluster	OC	07 44 30.0	-23 51 00.0	Pup	6.20	CB93 Map 5
NGC 6514	M20 - Trifid Nebula	C+N	18 02 42.0	-22 58 00.0	Sgr	6.30	CB93 Map 11
NGC 7078	M15 - Great Pegasus Cluster	Gb	21 30 00.0	+12 10 00.0	Peg	6.40	CB93 Map 2
NGC 5272	M3	Gb	13 42 12.0	+28 23 00.0	CVn	6.40	CB93 Map 6
NGC 1912	M38 - Starfish Cluster	OC	05 28 42.0	+35 51 00.0	Aur	6.40	CB93 Map 3
NGC 457	Dragonfly Cluster	OC	01 19 30.0	+58 17 00.0	Cas	6.40	CB93 Map 1
NGC 7089	M2	Gb	21 33 30.0	-00 49 00.0	Aqr	6.50	CB93 Map 2
NGC 6341	M92	Gb	17 17 06.0	+43 08 00.0	Her	6.50	CB93 Map 7 and 15
NGC 6254	M10	Gb	16 57 06.0	-04 06 00.0	Oph	6.60	CB93 Map 11
NGC 6218	M12 - Gumball Cluster	Gb	16 47 12.0	-01 57 00.0	Oph	6.60	CB93 Map 11
NGC 6913	M29 - Cooling Tower	OC	20 23 54.0	+38 32 00.0	Cyg	6.60	CB93 Map 8
NGC 6266	M62- Flickering Globular	Gb	17 01 12.0	-30 07 00.0	Oph	6.60	CB93 Map 12
NGC 6626	M28	Gb	18 24 30.0	-24 52 00.0	Sgr	6.90	CB93 Map 13 and 14
NGC 3031	M81 - Bode's Nebula	Gx	09 55 36.0	+69 04 00.0	UMa	6.90	CB93 Map 4 and 15
NGC 1502	Kemble's Cascade	OC	04 07 48.0	+62 20 00.0	Cam	6.90	CB93 Map 4
NGC 2682	M67- King Cobra	OC	08 50 48.0	+11 49 00.0	Cnc	6.90	CB93 Map 5
NGC 6613	M18 - Black Swan	OC	18 19 54.0	-17 08 00.0	Sgr	6.90	CB93 Map 11 and 14
NGC 6809	M55- The Spectre	Gb	19 40 00.0	-30 58 00.0	Sgr	7.00	CB93 Map 13 and 14
NGC 6093	M80	Gb	16 17 00.0	-22 59 00.0	Sco	7.20	CB93 Map 12
NGC 6273	M19	Gb	17 02 36.0	-26 16 00.0	Oph	7.20	CB93 Map 11 and 12
NGC 6853	M27 - Dumbbell Nebula	Pl	19 59 36.0	+22 43 00.0	Vul	7.30	CB93 Map 2 and 8
NGC 581	M103	OC	01 33 24.0	+60 39 00.0	Cas	7.40	CB93 Map 1 and 4
NGC 5236	M83 - Southern Pinwheel	Gx	13 37 00.0	-29 52 00.0	Hya	7.50	CB93 Map 9
NGC 6402	M14	Gb	17 37 36.0	-03 15 00.0	Oph	7.60	CB93 Map 11

CB93 Best Objects in the Sky for Small Telescopes and Binoculars - sorted by Magnitude (lower numbers are brighter)

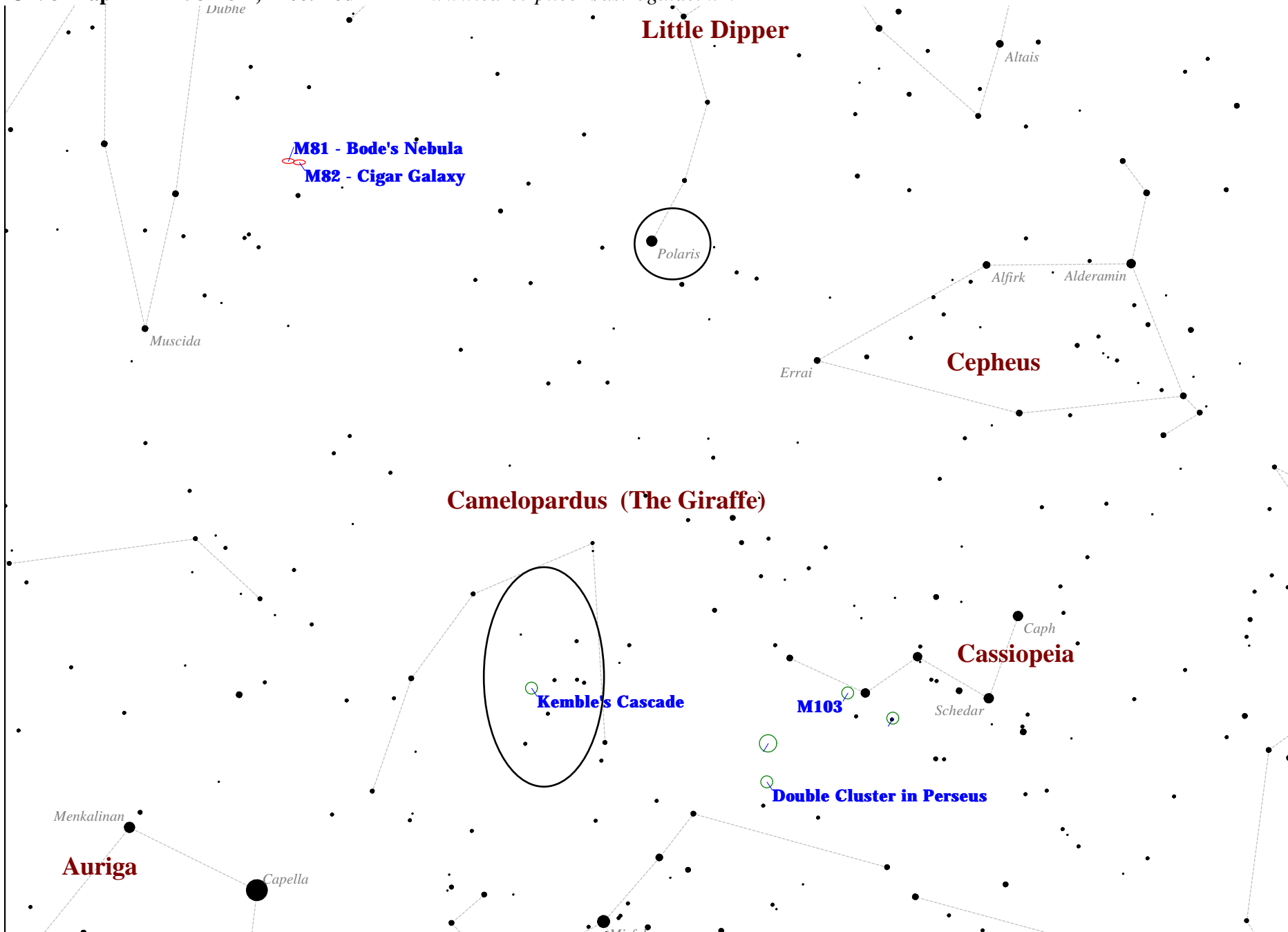
Object Id	Other Id	Type	R.A.	Decl.	Const	Mag 1	Description
NGC 5024	M53	Gb	13 12 54.0	+18 10 00.0	Com	7.70	CB93 Map 6
NGC 6715	M54	Gb	18 55 06.0	-30 29 00.0	Sgr	7.70	CB93 Map 13 and 14
NGC 6637	M69	Gb	18 31 24.0	-32 21 00.0	Sgr	7.70	CB93 Map 13 and 14
NGC 5457	M101 - Pinwheel Galaxy	Gx	14 03 12.0	+54 21 00.0	UMa	7.90	CB93 Map 15
NGC 6333	M9	Gb	17 19 12.0	-18 31 00.0	Oph	7.90	CB93 Map 11 and 12
NGC 4594	M104 - Sombrero Galaxy	Gx	12 40 00.0	-11 37 00.0	Vir	8.00	CB93 Map 9
NGC 6694	M26	OC	18 45 12.0	-09 24 00.0	Sct	8.00	CB93 Map 2, 11 and 14
NGC 6171	M107	Gb	16 32 30.0	-13 03 00.0	Oph	8.10	CB93 Map 11
NGC 6681	M70	Gb	18 43 12.0	-32 18 00.0	Sgr	8.10	CB93 Map 13 and 14
NGC 4590	M68	Gb	12 39 30.0	-26 45 00.0	Hya	8.20	CB93 Map 9
NGC 4736	M94 - Croc's Eye	Gx	12 50 54.0	+41 07 00.0	CVn	8.20	CB93 Map 7 and 15
NGC 6779	M56	Gb	19 16 36.0	+30 11 00.0	Lyr	8.30	CB93 Map 8
NGC 3034	M82 - Cigar Galaxy	Gx	09 55 54.0	+69 41 00.0	UMa	8.40	CB93 Map 4 and 15
NGC 4826	M64 - Black-Eye Galaxy	Gx	12 56 42.0	+21 41 00.0	Com	8.50	CB93 Map 6
NGC 4486	M87 - Virgo A	Gx	12 30 48.0	+12 23 00.0	Vir	8.60	CB93 Map 6
NGC 5055	M63 - Sunflower Galaxy	Gx	13 15 48.0	+42 02 00.0	CVn	8.60	CB93 Map 7 and 15
NGC 6864	M75	Gb	20 06 06.0	-21 55 00.0	Sgr	8.60	CB93 Map 14
NGC 3627	M66 - in the Leo Triplet	Gx	11 20 12.0	+13 00 00.0	Leo	8.90	CB93 Map 6 and 10
NGC 4406	M86 - Markarian's chain	Gx	12 26 12.0	+12 57 00.0	Vir	8.90	CB93 Map 6
NGC 4374	M84 - Markarian's Chain	Gx	12 25 06.0	+12 53 00.0	Vir	9.10	CB93 Map 6
NGC 3368	M96	Gx	10 46 48.0	+11 49 00.0	Leo	9.30	CB93 Map 10
NGC 3623	M65 - in the Leo Triplet	Gx	11 18 54.0	+13 05 00.0	Leo	9.30	CB93 Map 6 and 10
NGC 6720	M57 - Ring Nebula	Pl	18 53 36.0	+33 02 00.0	Lyr	9.40	CB93 Map 8
NGC 4569	M90	Gx	12 36 48.0	+13 10 00.0	Vir	9.50	CB93 Map 6
NGC 4501	M88 - Markarian's Chain	Gx	12 32 00.0	+14 25 00.0	Com	9.60	CB93 Map 6
NGC 3351	M95	Gx	10 44 00.0	+11 42 00.0	Leo	9.70	CB93 Map 10
NGC 4552	M89	Gx	12 35 42.0	+12 33 00.0	Vir	9.80	CB93 Map 6
NGC 4254	M99 - Coma PinWheel Galaxy	Gx	12 18 48.0	+14 25 00.0	Com	9.90	CB93 Map 6
NGC 4192	M98	Gx	12 13 48.0	+14 54 00.0	Com	10.10	CB93 Map 6
NGC 3587	M97 - Owl Nebula	Pl	11 14 48.0	+55 01 00.0	UMa	11.00	CB93 Map 15

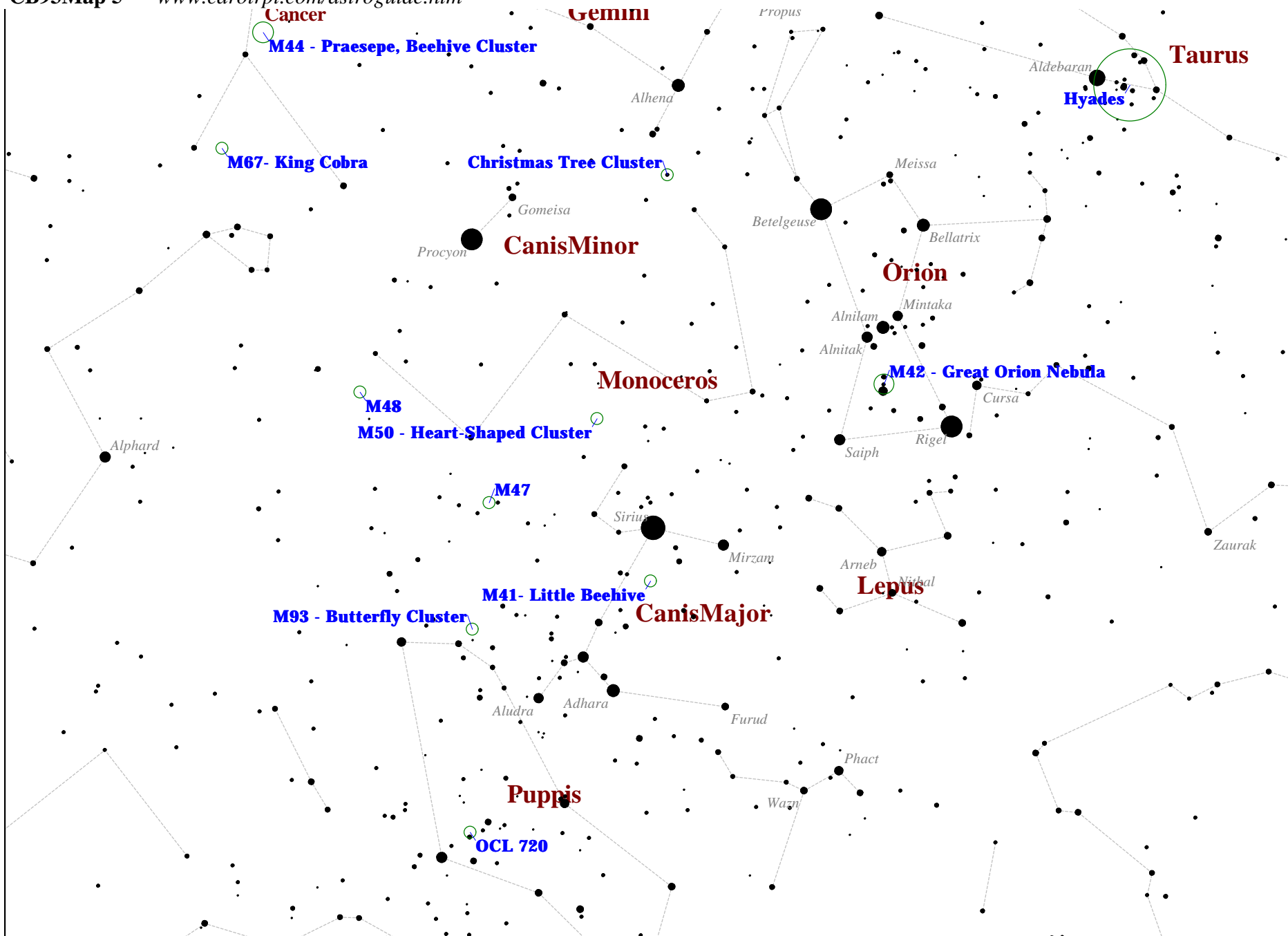


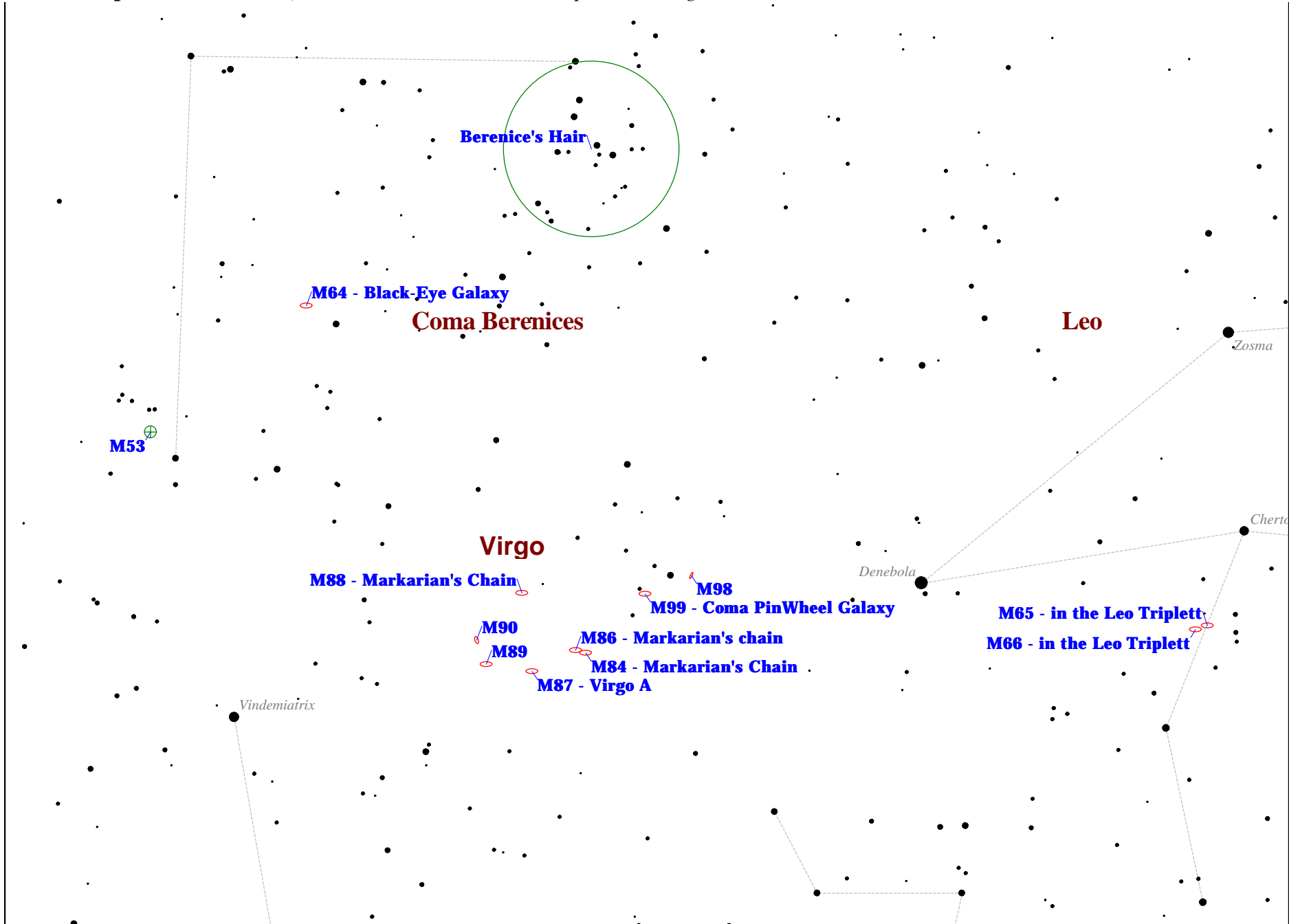


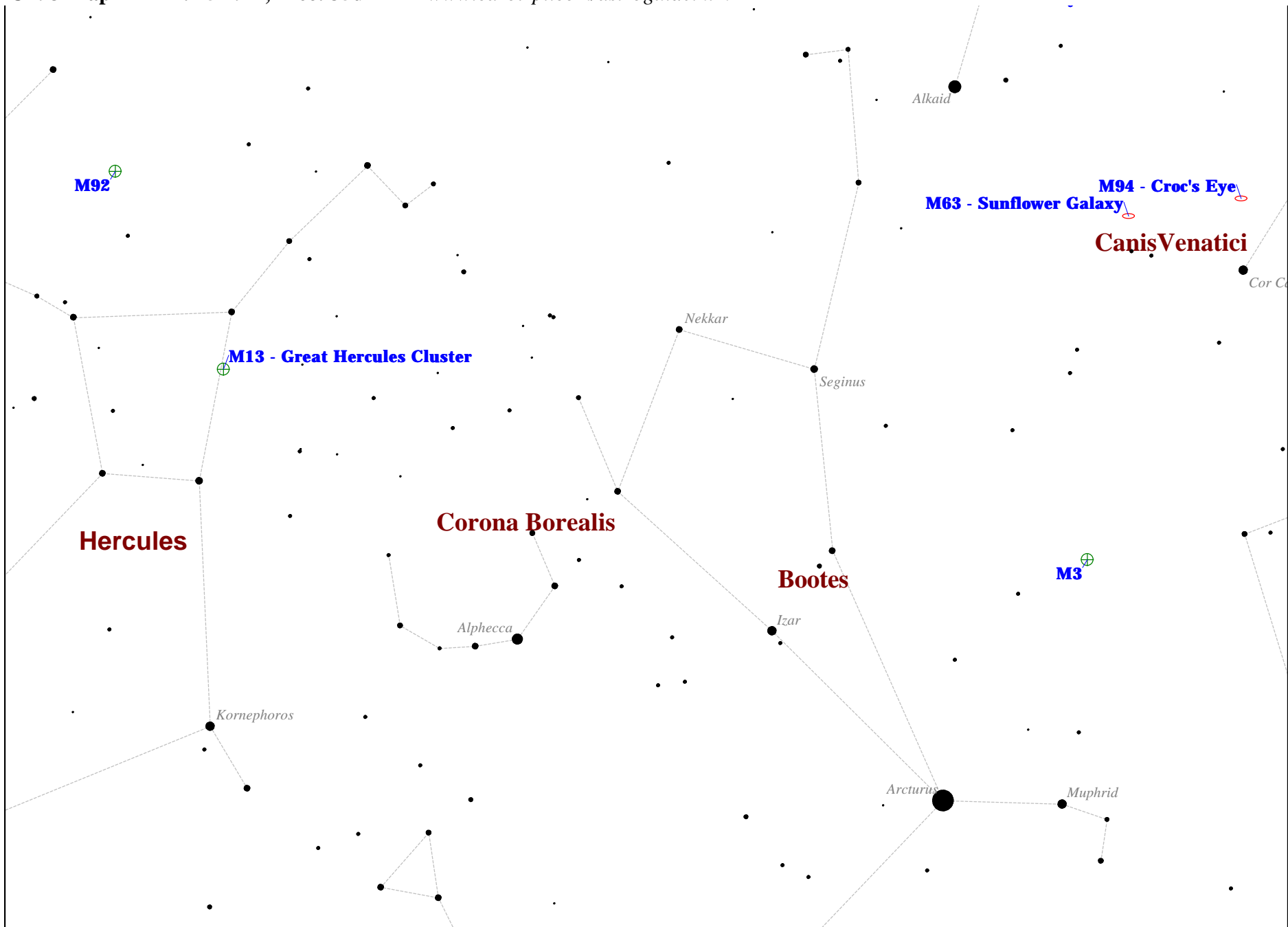


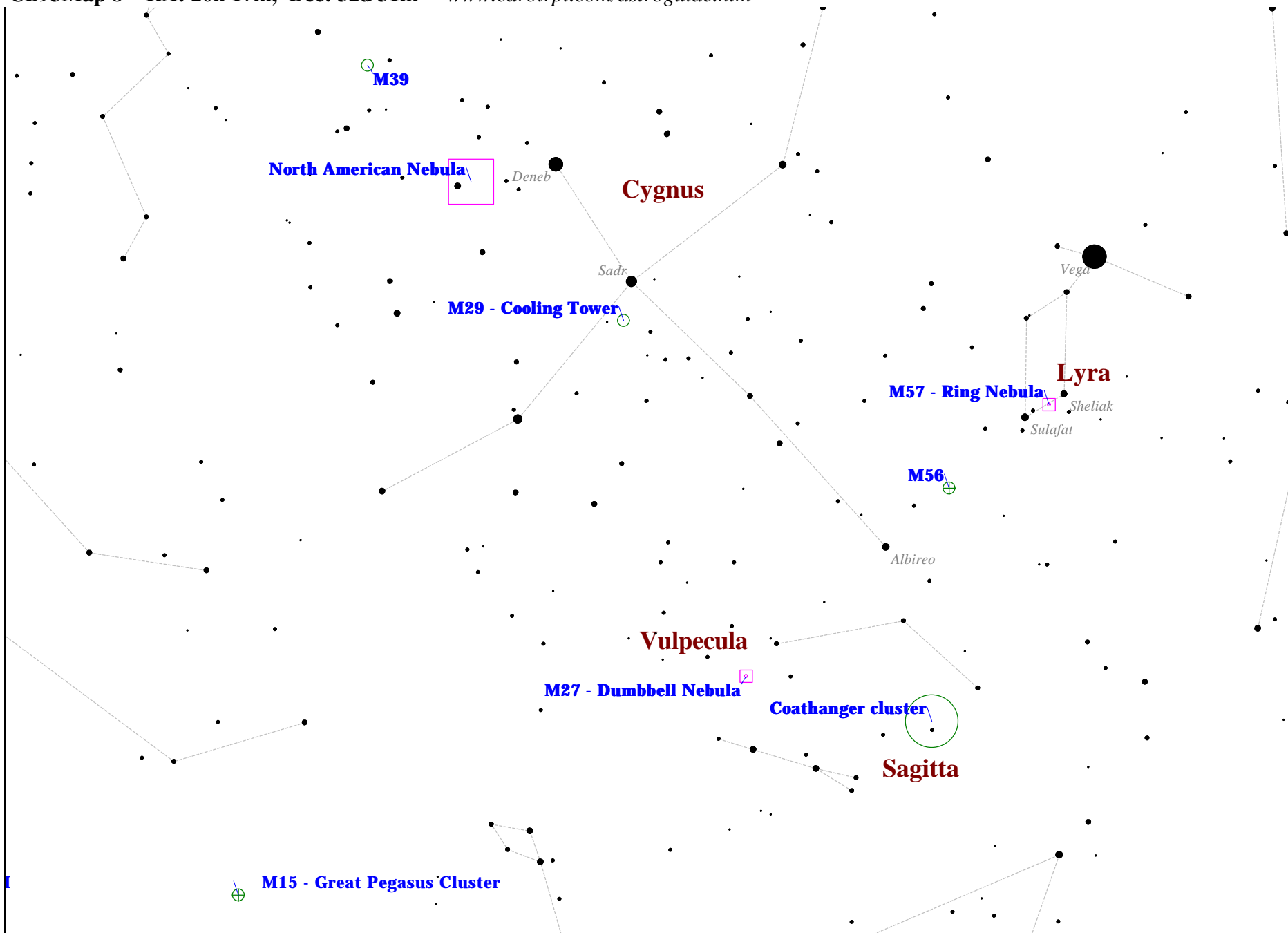




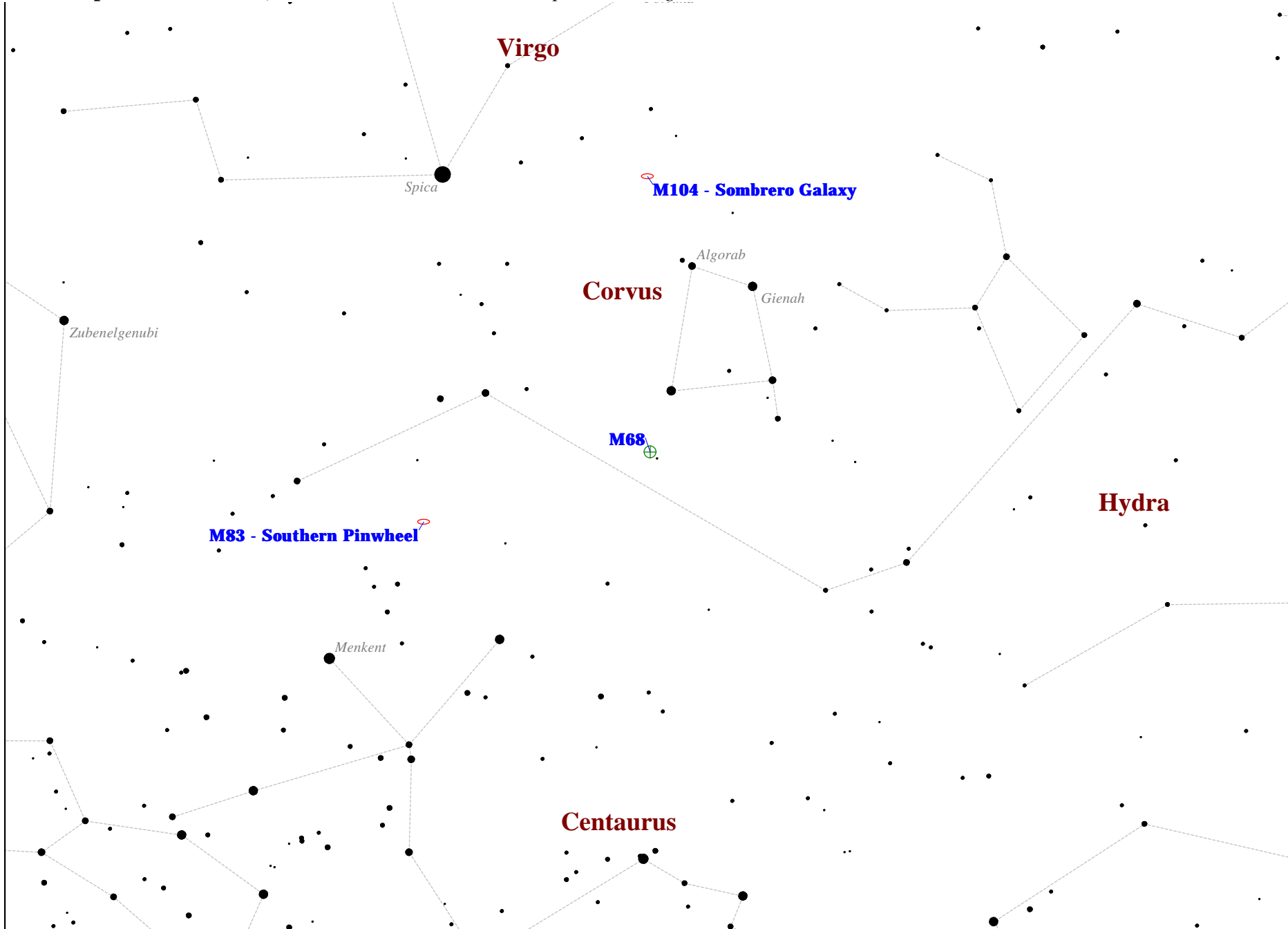


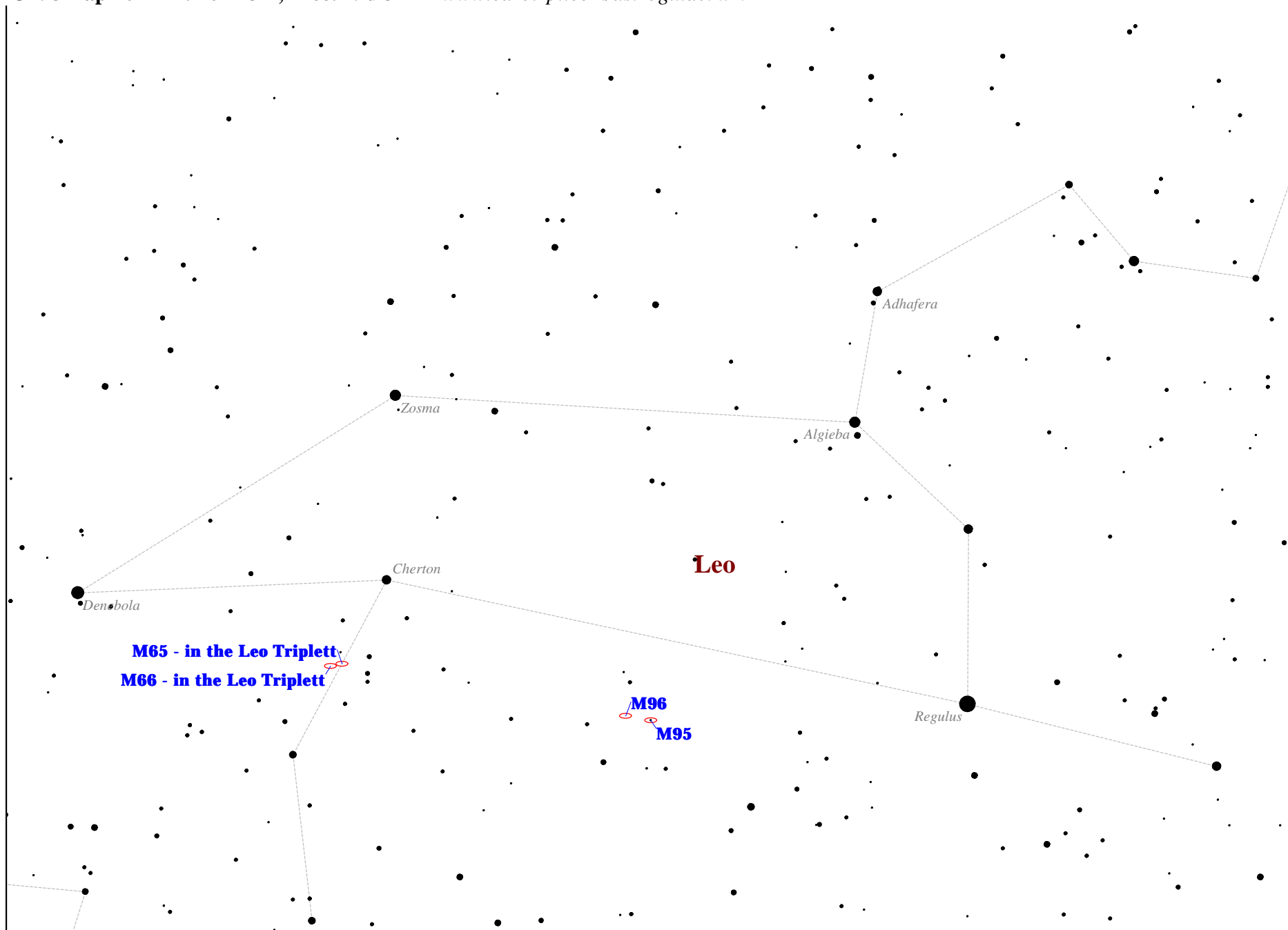


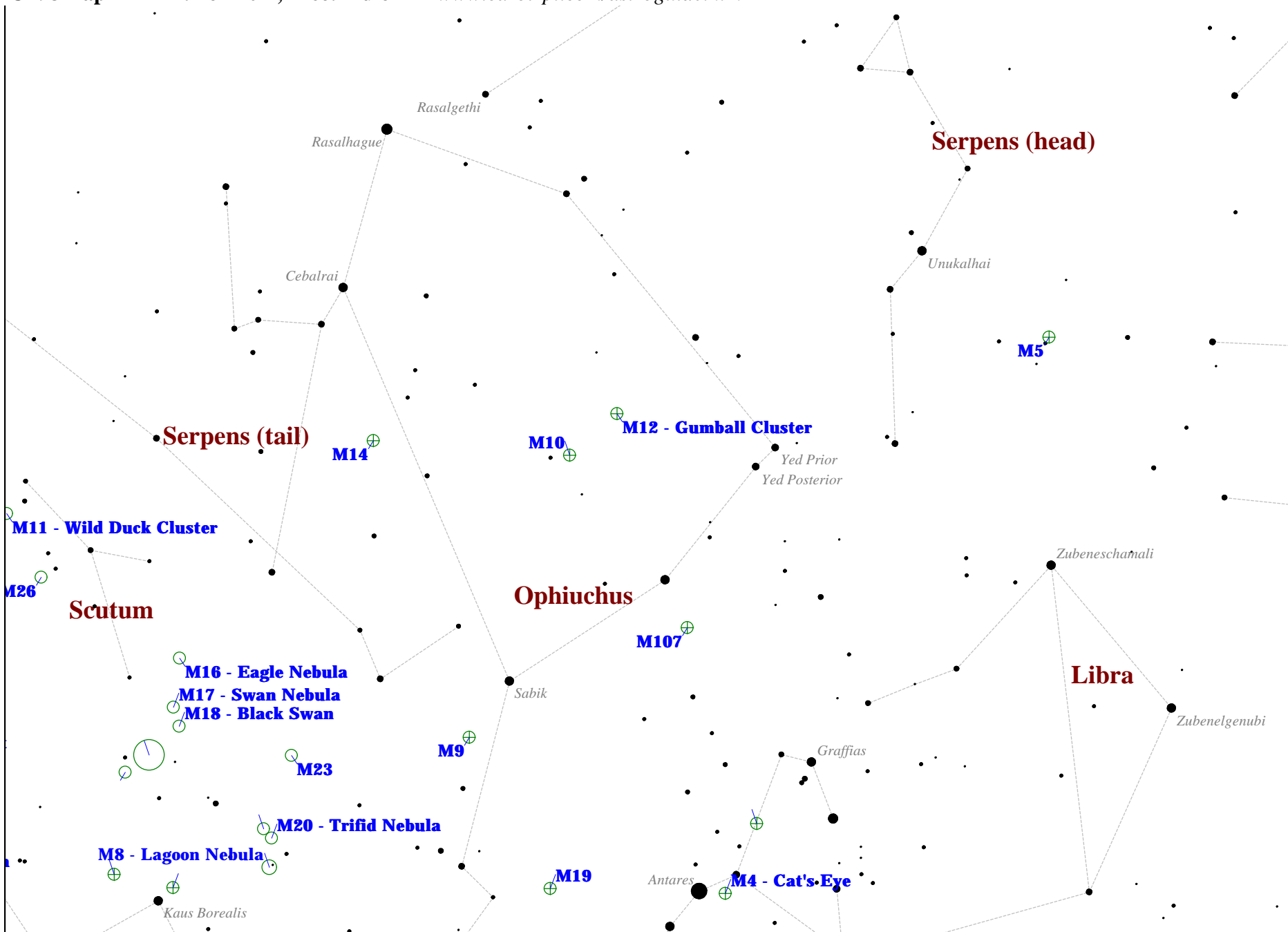


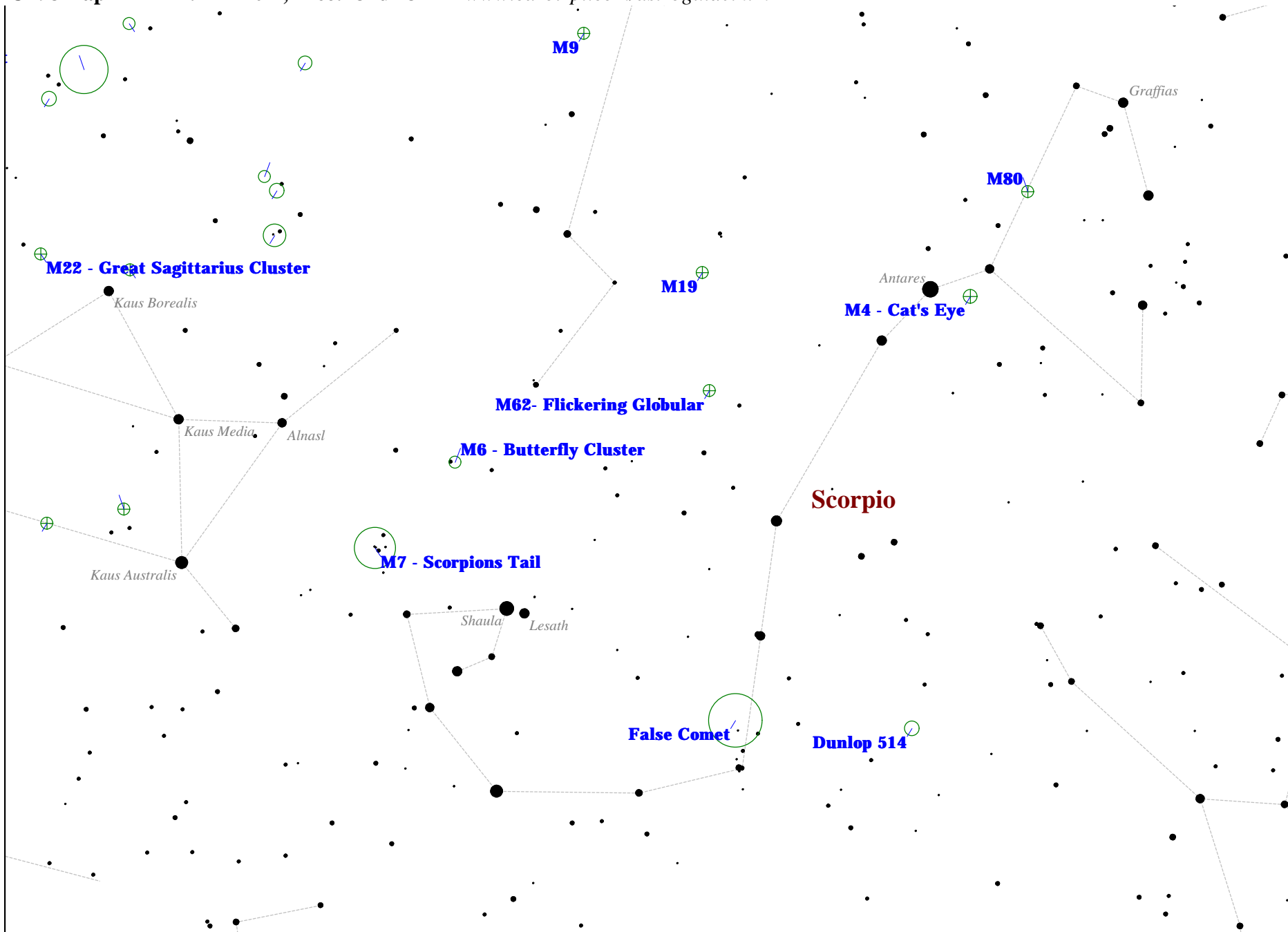


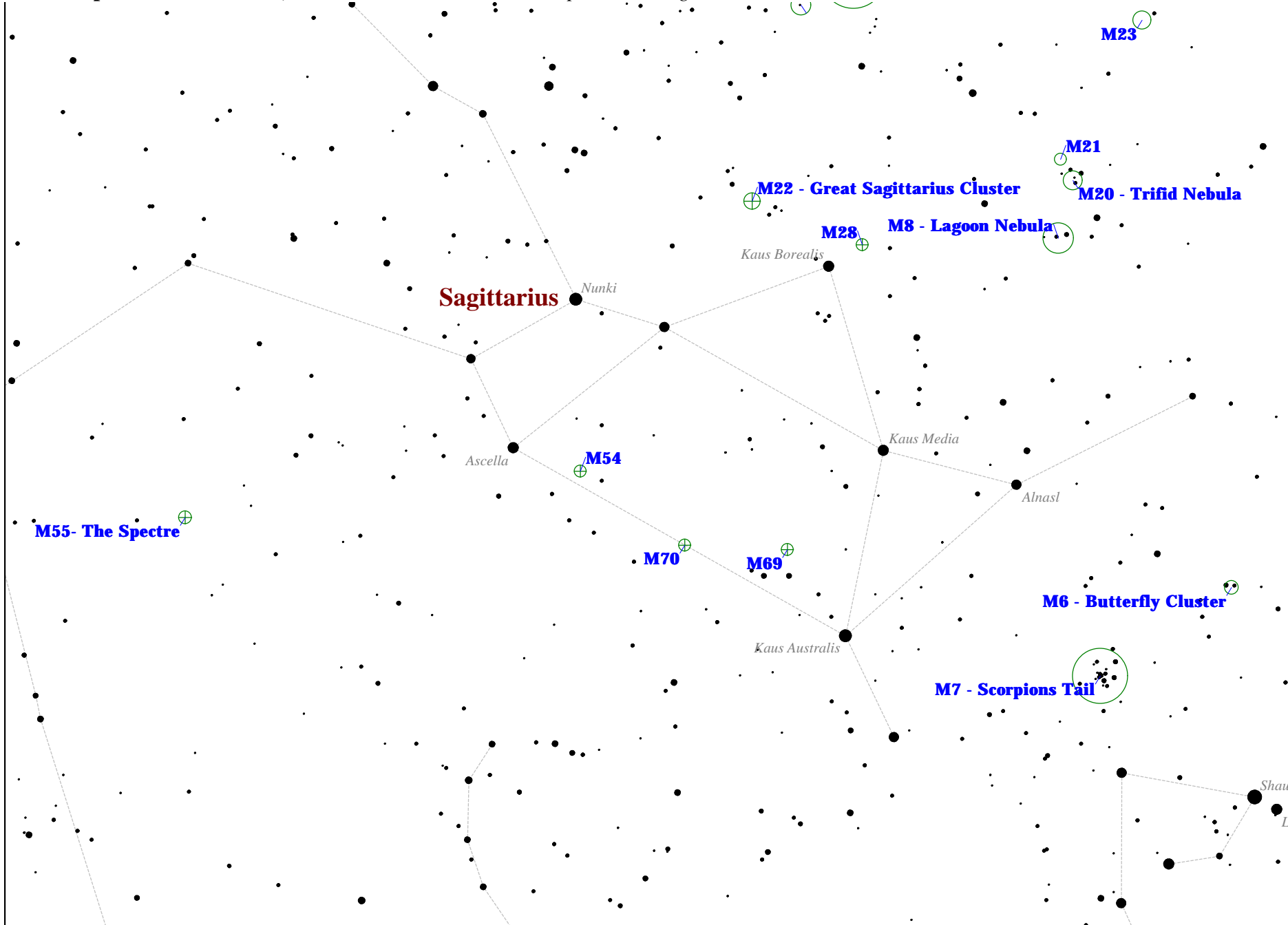




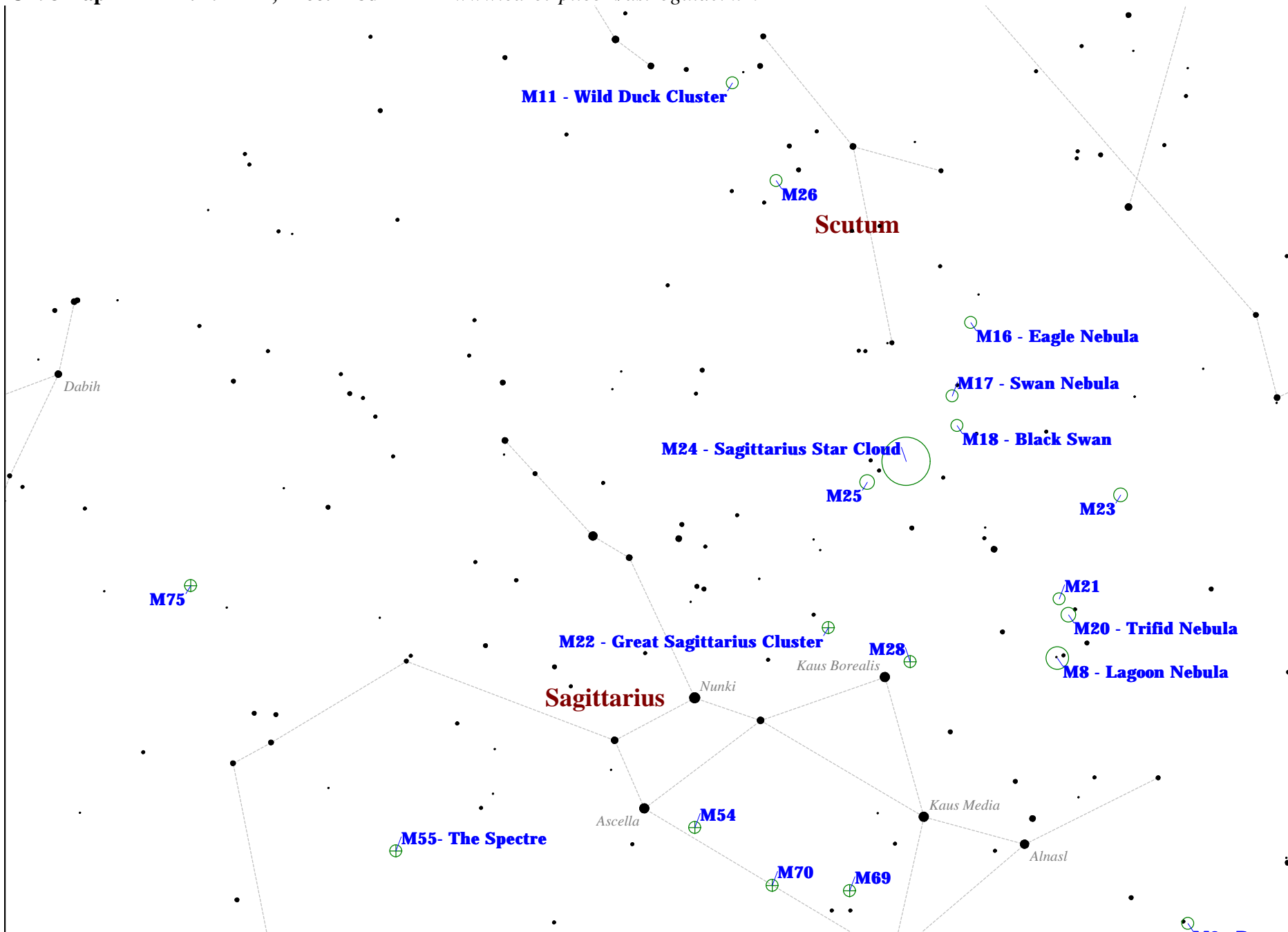


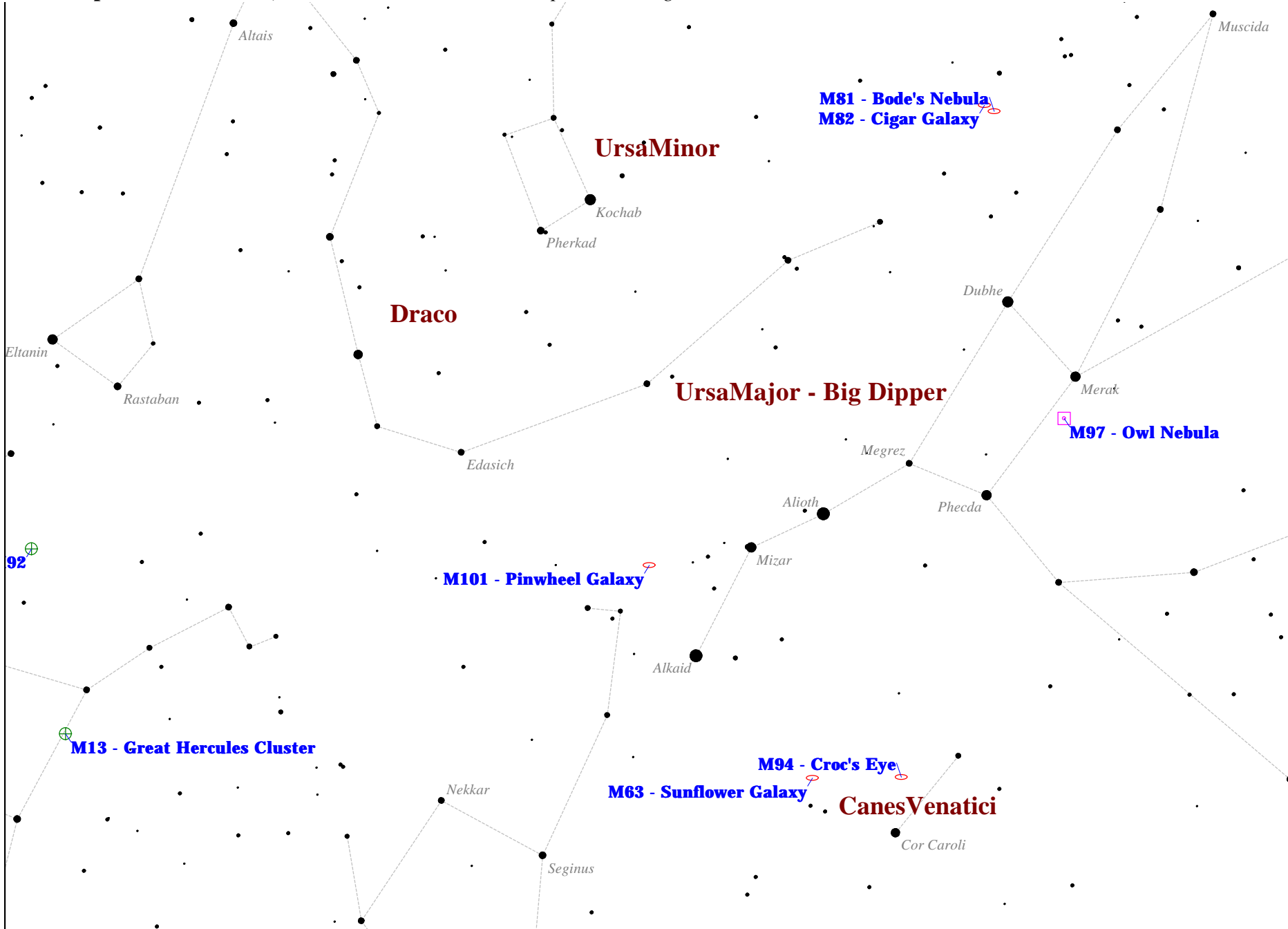












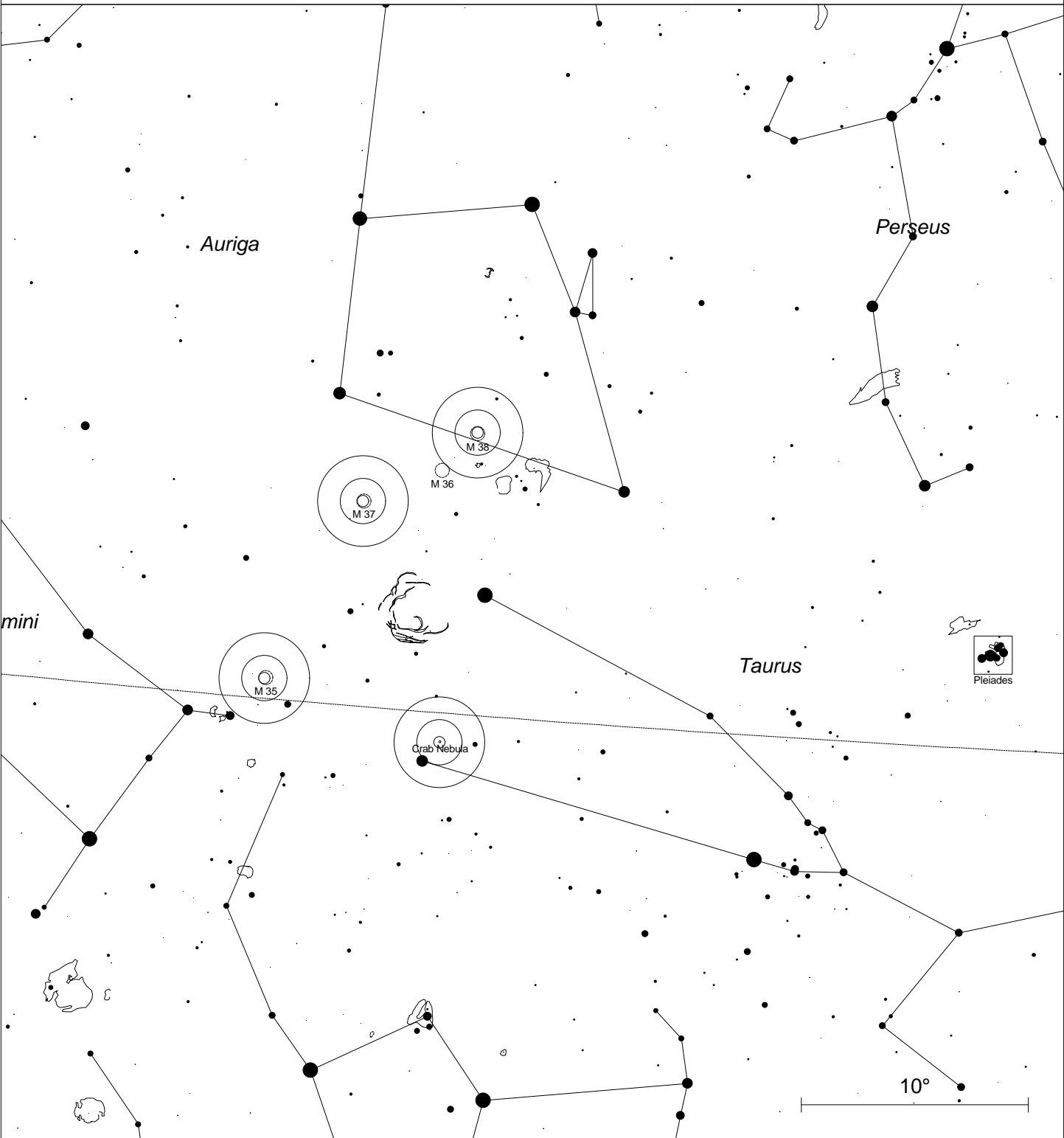
## Map and Constallation Key to Messier Objects for TELRAD Finders

Messier Object	Constallation	Telrad Map #'s	Common Name	Type	Distance Light Years	Other Data
M1	Taurus	Map 1, 2	Crab Nebula	Supernova	6,000	
M2	Aquarius	Map 11		Glob. Cluster		
M3	Canies Venatici	Map 6, 7		Glob. Cluster	30,000	44500 Stars
M4	Scorpius	Map 13		Glob. Cluster		
M5	Serpens	Map 6		Glob. Cluster		
M6	Scorpius	Map 10, 13	Butterfly Cluster	Open Cluster	2,000	
M7	Scorpius	Map 10, 13		Open Cluster		
M8	Sagittarius	Map 10	Lagoon Nebula	Emmi. Nebula	2,500	
M9	Ophiuchus	Map 12,10,13		Glob. Cluster		
M10	Ophiuchus	Map 12		Glob. Cluster		
M11	Scutum	Map 12	Wild Duck Cluster	Open Cluster		
M12	Ophiuchus	Map 12		Glob. Cluster		
M13	Hercules	Map 9		Glob. Cluster	25,000	
M14	Ophiuchus	Map 12, 10		Glob. Cluster		
M15	Pegasus	Map 11		Glob. Cluster		
M16	Serpens	Map 10	Star-Queen/Eagle	Emmi. Nebula		
M17	Sagittarius	Map 10	Swan/Omega Nebula	Emmi. Nebula		35 Stars
M18	Sagittarius	Map 10		Open Cluster	6,000	
M19	Ophiuchus	Map 13		Glob. Cluster		
M20	Sagittarius	Map 10	Trifid Nebula	Emmi. Nebula	2,200	
M21	Sagittarius	Map 10		Open Cluster	3,000	
M22	Sagittarius	Map 10		Glob. Cluster	10,000	70,000 Stars
M23	Sagittarius	Map 10, 12		Open Cluster	4,500	
M24	Sagittarius	Map 10		Star Cloud		
M25	Sagittarius	Map 10		Open Cluster		
M26	Scutum	Map 10		Glob. Cluster	5,000	
M27	Vupecula	Map 8	Dumbell Nebula	Planatary Neb.	1,250	
M28	Sagittarius	Map 10		Glob. Cluster	15,000	
M29	Cygnus	Map 8		Open Cluster	7,200	
M30	Capricornus	Map 11		Glob. Cluster		
M31	Andromeda	Map 3	Andromeda Galaxy	G-Spiral	2.2 mil	160 mil suns
M32	Andromeda	Map 3	Andromeda Comp.	G-Elliptical		
M33	Triangulum	Map 3		G-Spiral		
M34	Perseus	Map 3		Open Cluster		
M35	Gemini	Map 2		Open Cluster	2,800	
M36	Auriga	Map 1		Open Cluster	4,100	
M37	Auriga	Map 1		Open Cluster	4,600	
M38	Auriga	Map 1		Open Cluster	4,200	
M39	Cygnus	Map 8, 3		Open Cluster		
M40	Ursa Major	Map 5		Two Stars		
M41	Canis Major	Map 2		Open Cluster	2,400	
M42	Orion	Map 2		Emmi Nebula	1,000	
M43	Orion	Map 2		Emmi Nebula	1,000	
M44	Sagittarius	Map 2	Beehive Cluster	Open Cluster	500	40 Stars
M45	Taurus	Map 1	Pleiades	Open Cluster	400	
M46	Puppis	Map 2		Open Cluster		
M47	Puppis	Map 2		Open Cluster		
M48	Hydra	Map 2		Open Cluster		
M49	Virgo	Map 7		G-Elliptical		
M50	Monoceros	Map 2		Open Cluster		
M51	Canes Venatici	Map 5	Whirlpool Galaxy	G-Spiral	15 mil	
M52	Cassiopeia	Map 3		Open Cluster		
M53	Coma Berenices	Map 6, 7		Glob. Cluster		
M54	Sagittarius	Map 10		Glob. Cluster	50,000	
M55	Sagittarius	Map 10		Glob. Cluster	20,000	
M56	Lyra	Map 8		Glob. Cluster	40,000	
M57	Lyra	Map 8, 9	Ring Nebula	Planatary Neb.	4,100	

## Map and Constallation Key to Messier Objects for TELRAD Finders

Messier Object	Constallation	Telrad Map #'s	Common Name	Type	Distance Light Years	Other Data
M58	Virgo	Map 7		G-Spiral		
M59	Virgo	Map 7		G-Elliptical		
M60	Virgo	Map 7		G-Elliptical		
M61	Virgo	Map 7, 14	Blackeye Galaxy	G-Spiral		
M62	Ophiuchus	Map 13		Glob. Cluster		
M63	Canes Venatici	Map 5, 6	Sunflower Galaxy	G-Spiral		
M64	Coma Berenices	Map 6, 7		G-Spiral		
M65	Leo	Map 4, 7		G-Spiral	35 mil	
M66	Leo	Map 4		G-Spiral		
M67	Cancer	Map 2		Open Cluster		
M68	Hydra	Map 14		Glob. Cluster		
M69	Sagittarius	Map 10		Glob. Cluster		
M70	Sagittarius	Map 10		Glob. Cluster	65,000	
M71	Sagittarius	Map 8		Glob. Cluster	8,500	One of nearest
M72	Aquarius	Map 11		Glob. Cluster		
M73	Aquarius	Map 11		Open Cluster		
M74	Pisces	Map 3		G-Spiral		
M75	Sagittarius	Map 11		Glob. Cluster		
M76	Perseus	Map 3	Little Dumbell	Planetary Neb.	3,400	
M77	Cetus	Map 15		G-Spiral		
M78	Orion	Map 2		Refle. Nebula		
M79	Lepus	Map 2		Glob. Cluster	54,000	
M80	Scorpius	Map 13		Glob. Cluster		
M81	Ursa Major	Map 5		G-Spiral	7 mil	
M82	Ursa Major	Map 5	Exploding Galaxy	G-Irregular		
M83	Hydra	Map 14		G-Spiral		
M84	Virgo	Map 7		G-Elliptical		
M85	Coma Berenices	Map 7		G-Spiral		
M86	Virgo	Map 7		G-Elliptical		
M87	Virgo	Map 7		G-Elliptical		
M88	Coma Berenices	Map 7		G-Spiral		
M89		Map 7		G-Elliptical		
M90	Virgo	Map 7		G-Spiral		
M91	Virgo	Map 7		G-Spiral		
M92	Hercules	Map 9		Glob. Cluster	28,000	
M93	Puppis	Map 2		Open Cluster		
M94	Canes Venatici	Map 5, 6		G-Spiral		
M95	Leo	Map 4		G-Spiral		
M96	Leo	Map 4		G-Spiral		
M97	Ursa Major	Map 5	Owl Nebula	Planetary Neb.	2,600	
M98	Coma Berenices	Map 7		G-Spiral		
M99	Coma Berenices	Map 7		G-Spiral		
M100	Coma Berenices	Map 7		G-Spiral		
M101	Ursa Major	Map 5		G-Spiral	15 mil	
M102	Draco	Map 5		G-Spiral	15 mil	
M103	Cassiopeia	Map 3		Open Cluster	8,000	
M104	Virgo	Map 14	Sombrero Galaxy	G-Spiral		
M105	Leo	Map 4		G-Elliptical		
M106	Canes Venatici	Map 5		G-Spiral		
M107	Ophiuchus	Map 12, 13		Glob. Cluster		
M108	Ursa Major	Map 5		G-Spiral	25 mil	
M109	Ursa Major	Map 5		G-Spiral		
M110	Andromeda	Map 3	Andromeda Comp.	G-Elliptical		

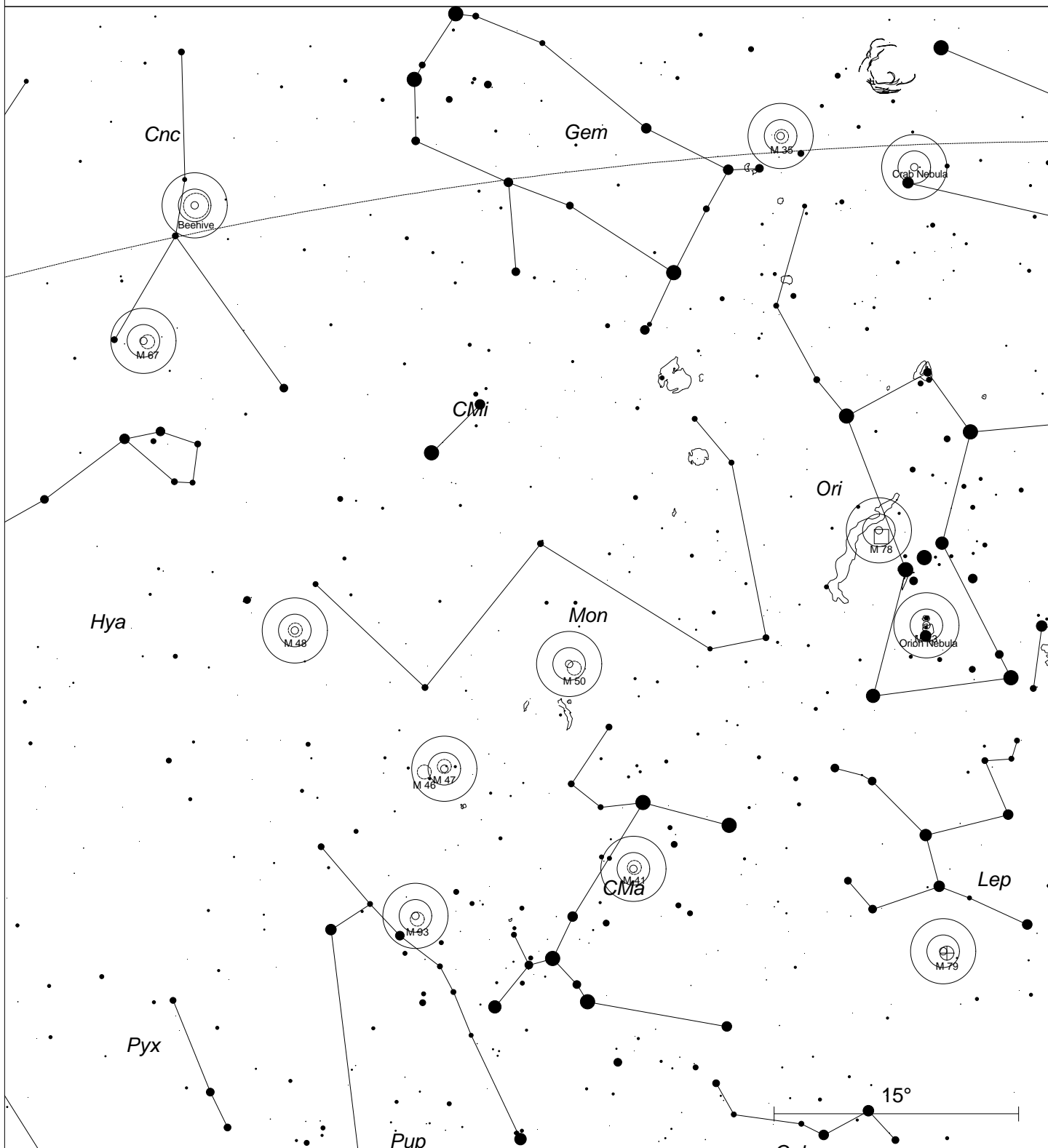
**MAP 1**  
**AURIGA, Taurus**  
**M1, M35, M36, M37, M38, M45**



STARS		SYMBOLS	
● <2	• 4.5	☄ Comet	⊕ Globular Cluster
● 2.5	• 5	☿ Asteroid	⊙ Planetary Nebula
● 3	• 5.5	☾ Galaxy	⊞ Quasar
● 3.5	• >6	○ Open Cluster	○ Other Object
● 4		☄ Bright Nebula	

Chart created using Sky Map 3.0  
[www.skymap.com](http://www.skymap.com)  
 Chris Marriott, John Small

**MAP 2**  
**CANNIS MAJOR, MONOCEROS, Cancer, Gemini, Orion, Lepus**  
**M1, M35, M41, M42, M43, M44, M45, M46, M47, M48, M50, M67, M78, M79, M93**



**STARS**

- <2    ● 4.5
- 2.5    ● 5
- 3       ● 5.5
- 3.5    ● >6
- 4

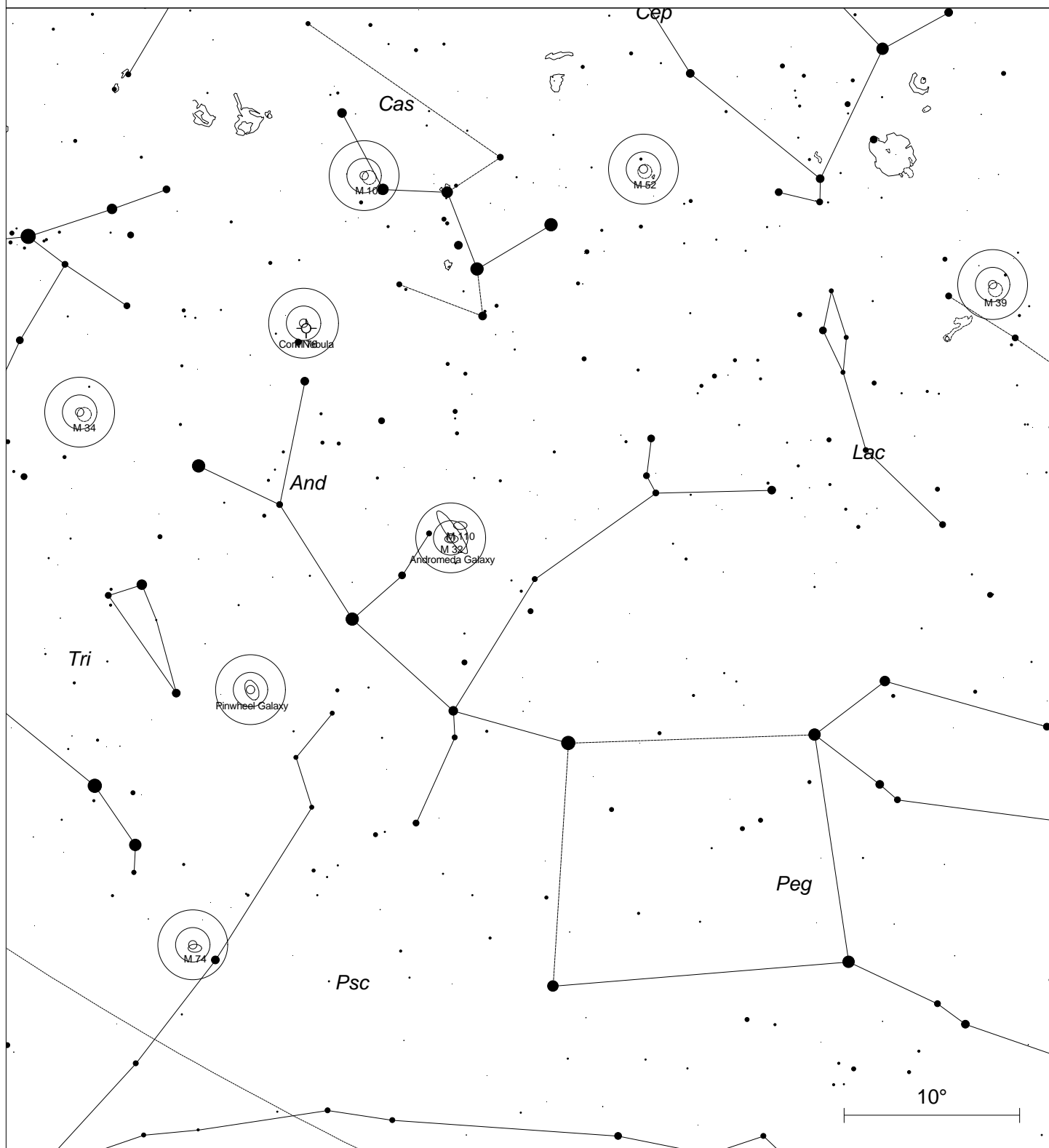
**SYMBOLS**

- ☄ Comet
- ☿ Asteroid
- Galaxy
- Open Cluster
- Bright Nebula
- ⊕ Globular Cluster
- ⊙ Planetary Nebula
- ⊞ Quasar
- Other Object

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 Chris Marriott, John Small



**MAP 3**  
**ANDROMEDA, TRANGULUM, LACERTA, Cassiopeia, Pegasus, Pisces**  
**M31, M32, M33, M34, M39, M52, M74, M76, M103, M110**



**STARS**

- |       |       |
|-------|-------|
| ● <2  | • 4.5 |
| ● 2.5 | • 5   |
| ● 3   | • 5.5 |
| ● 3.5 | • >6  |
| • 4   |       |

**SYMBOLS**

- |                 |                    |
|-----------------|--------------------|
| ☄ Comet         | ⊕ Globular Cluster |
| ♁ Asteroid      | ⊙ Planetary Nebula |
| ○ Galaxy        | ⊞ Quasar           |
| ○ Open Cluster  | ○ Other Object     |
| □ Bright Nebula |                    |

Chart created using Sky Map 3.0  
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 Chris Marriott, John Small

**MAP 4**  
**LEO, LEO MINOR**  
**M65, M66, M95, M96, M105**

*Leo Minor*

*Leo*

*Sextans*

10°

**STARS**

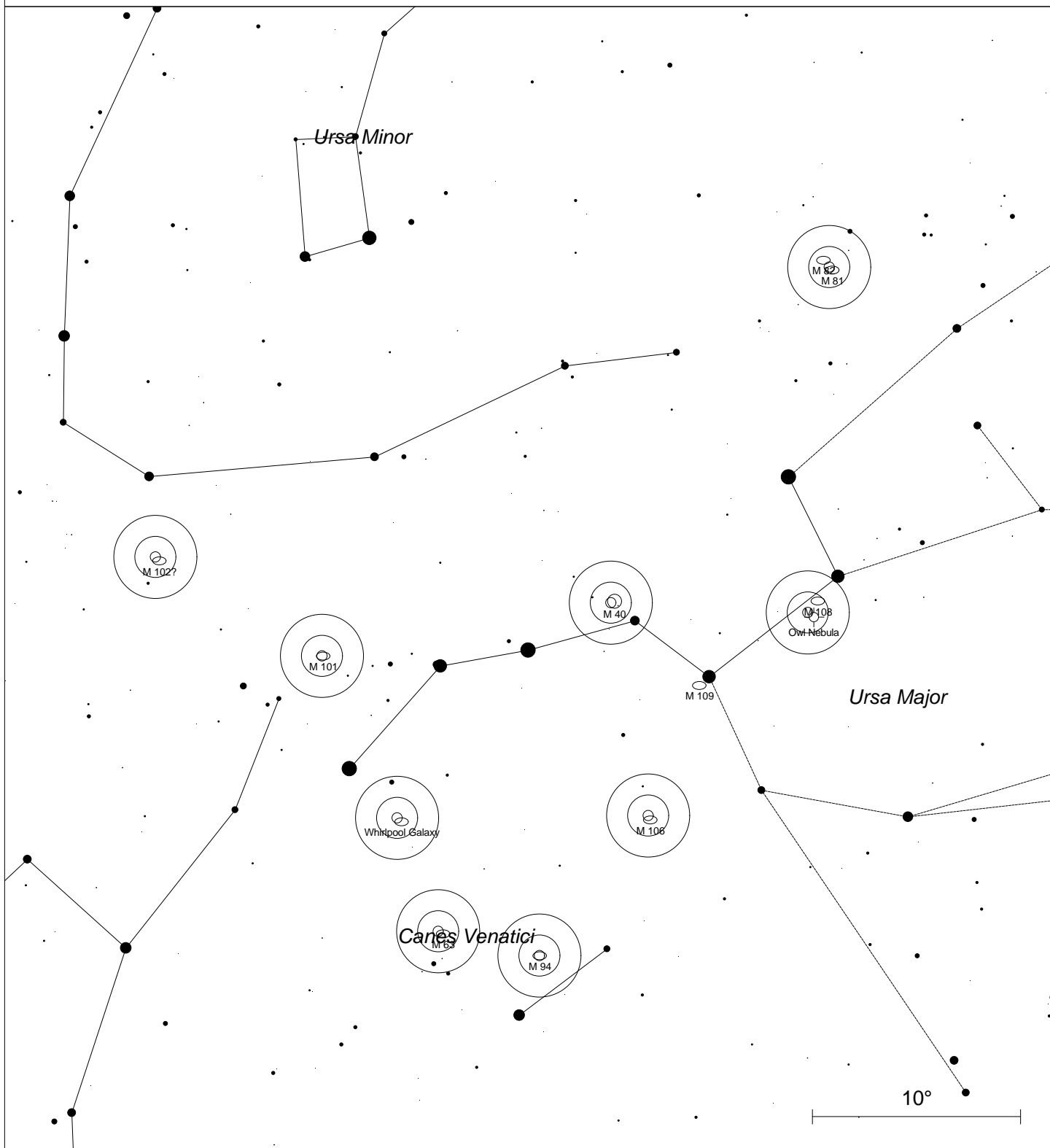
- <2    ● 4.5
- 2.5    ● 5
- 3       ● 5.5
- 3.5    ● >6
- 4

**SYMBOLS**

- ☄ Comet
- ♁ Asteroid
- Galaxy
- Open Cluster
- Bright Nebula
- ⊕ Globular Cluster
- ⊛ Planetary Nebula
- ⊞ Quasar
- Other Object

Chart created using Sky Map 3.0  
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**MAP 5**  
**CANES VENATICI, Ursa Major**  
**M40, M51, M63, M81, M82, M94, M97, M101, M102, M108, M109,**



**STARS**

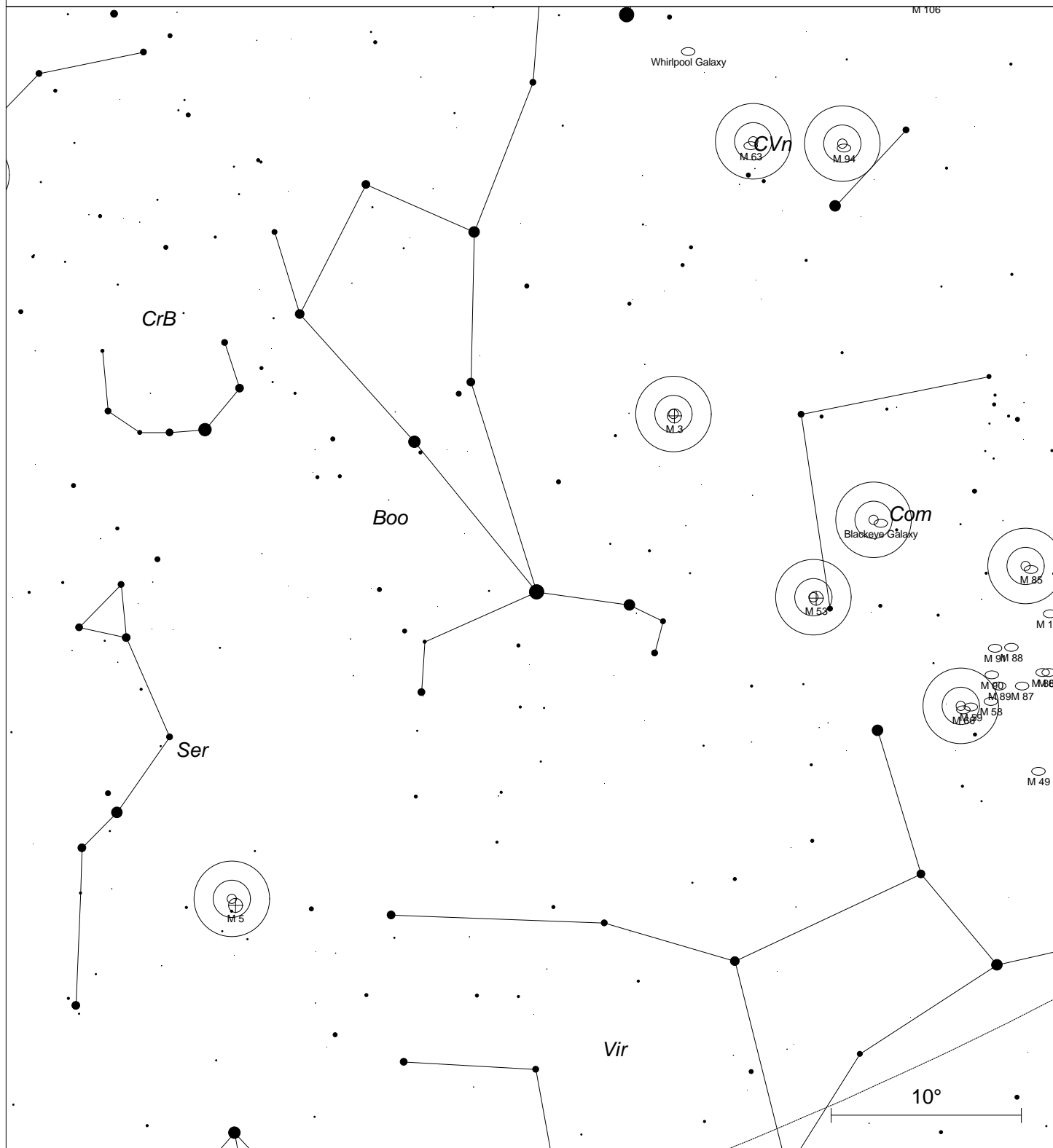
- |       |       |
|-------|-------|
| ● <2  | • 4.5 |
| ● 2.5 | • 5   |
| ● 3   | • 5.5 |
| ● 3.5 | • >6  |
| ● 4   |       |

**SYMBOLS**

- |                 |                    |
|-----------------|--------------------|
| ☄ Comet         | ⊕ Globular Cluster |
| ♁ Asteroid      | ♁ Planetary Nebula |
| 🌀 Galaxy        | ⊞ Quasar           |
| ○ Open Cluster  | ○ Other Object     |
| □ Bright Nebula |                    |

Chart created using Sky Map 3.0  
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**MAP 6**  
**SERPENS, COMA BERNICES, CANES VENATICI, Bootes**  
**M3, M5, M53, M63, M64, M94**



**STARS**

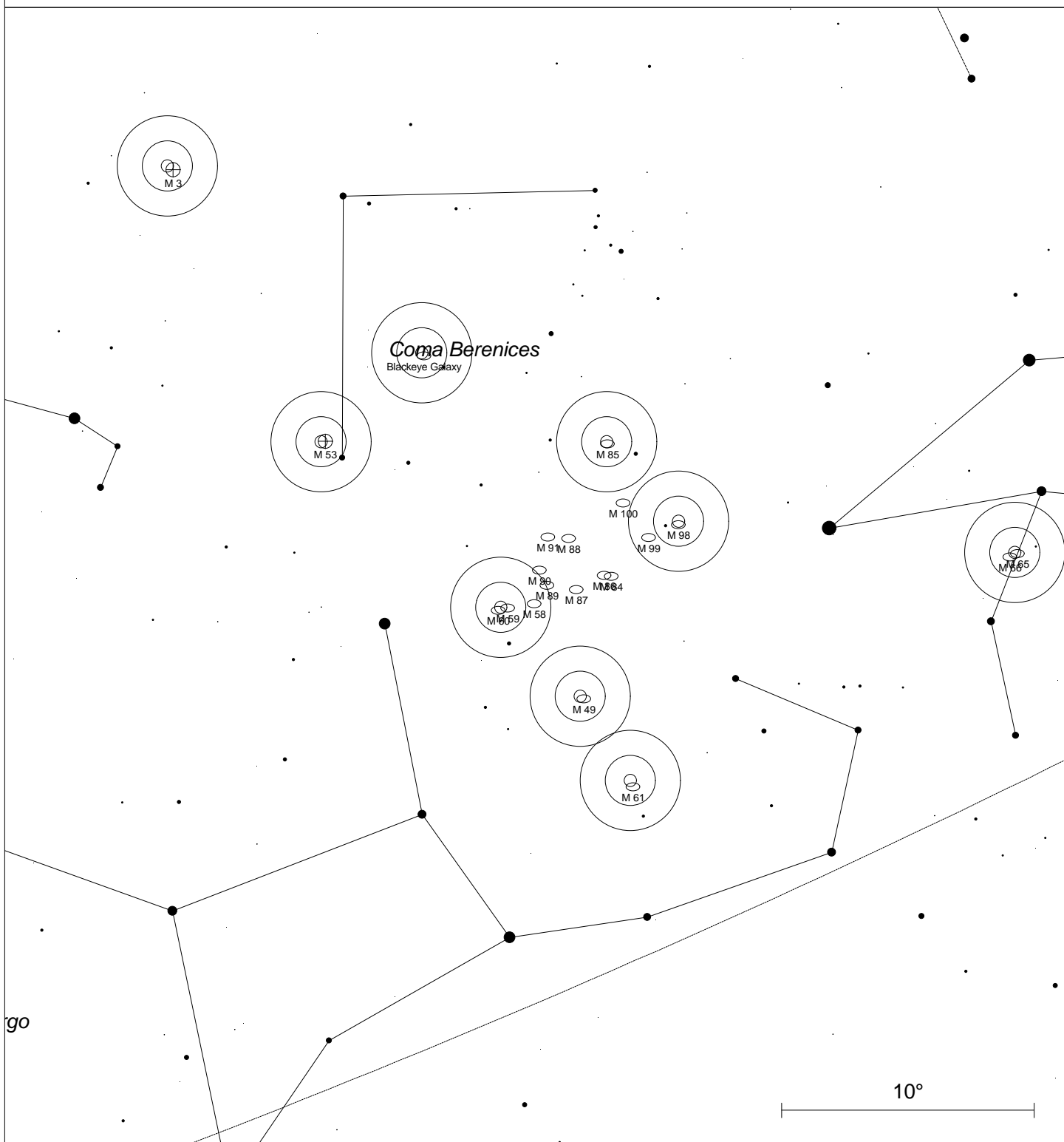
- |       |       |
|-------|-------|
| ● <2  | • 4.5 |
| ● 2.5 | • 5   |
| ● 3   | • 5.5 |
| ● 3.5 | • >6  |
| ● 4   |       |

**SYMBOLS**

- |               |                  |
|---------------|------------------|
| Comet         | Globular Cluster |
| Asteroid      | Planetary Nebula |
| Galaxy        | Quasar           |
| Open Cluster  | Other Object     |
| Bright Nebula |                  |

Chart created using Sky Map 3.0  
[www.skymap.com](http://www.skymap.com)  
 Chris Marriott, John Small

**MAP 7**  
**COMA BERENICES, Virgo, Leo (Virgo Cluster of Galaxies)**  
**M3, M49, M53, M58, M59, M60, M61, M64, M65, M66**  
**M84, M86, M87, M88, M90, M91, M98, M99, M100**



**STARS**

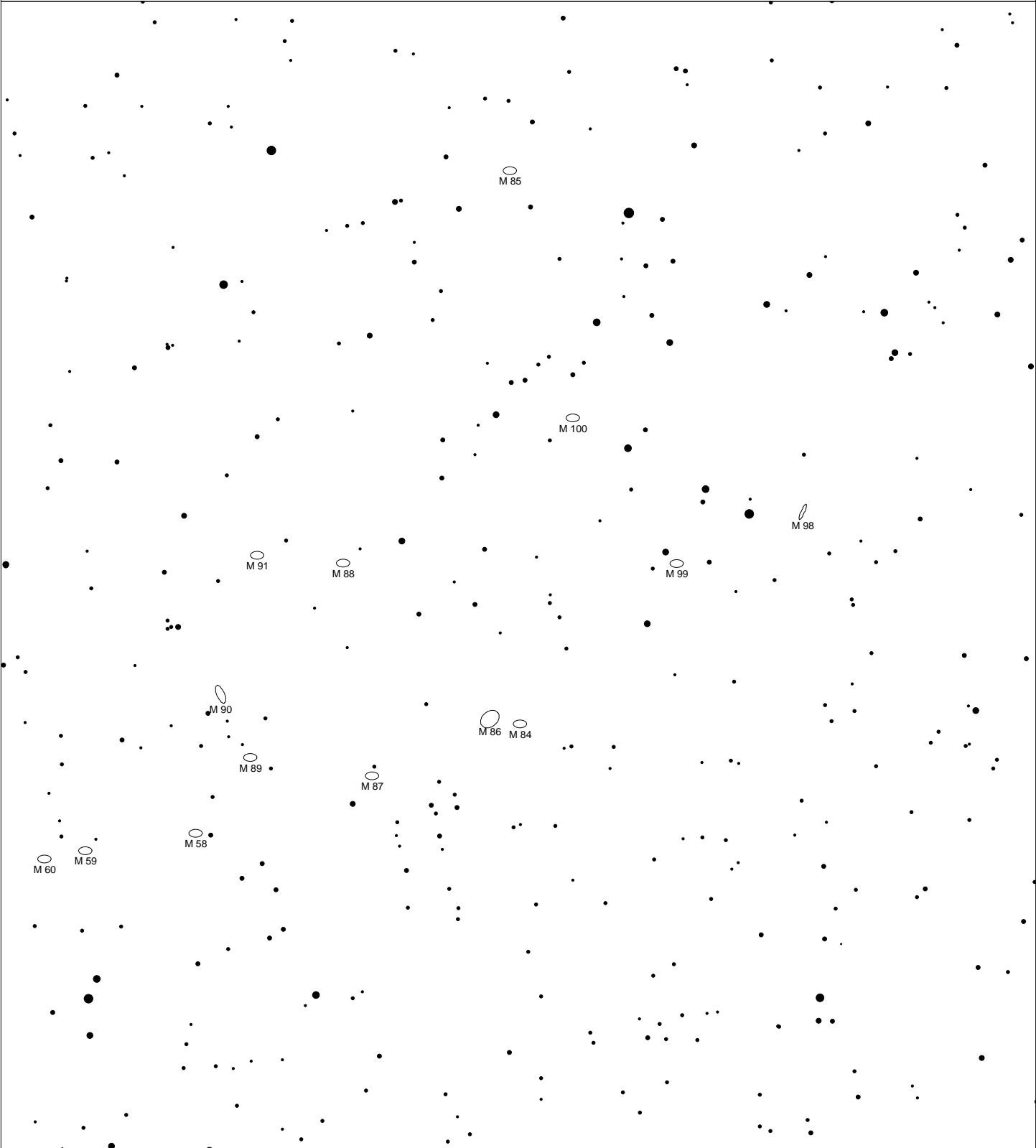
- <2    ● 4.5
- 2.5    ● 5
- 3       ● 5.5
- 3.5    ● >6
- 4

**SYMBOLS**

- ☄ Comet
- ☾ Asteroid
- Galaxy
- Open Cluster
- Bright Nebula
- ⊕ Globular Cluster
- ⊛ Planetary Nebula
- ⊞ Quasar
- Other Object

Chart created using Sky Map 3.0  
[www.skymap.com](http://www.skymap.com)  
 Chris Marriott, John Small

Zoom in View of Virgo Clusters



STARS

● <2	● 7
● 3	● 8
● 4	● 9
● 5	● 10
● 6	● >11

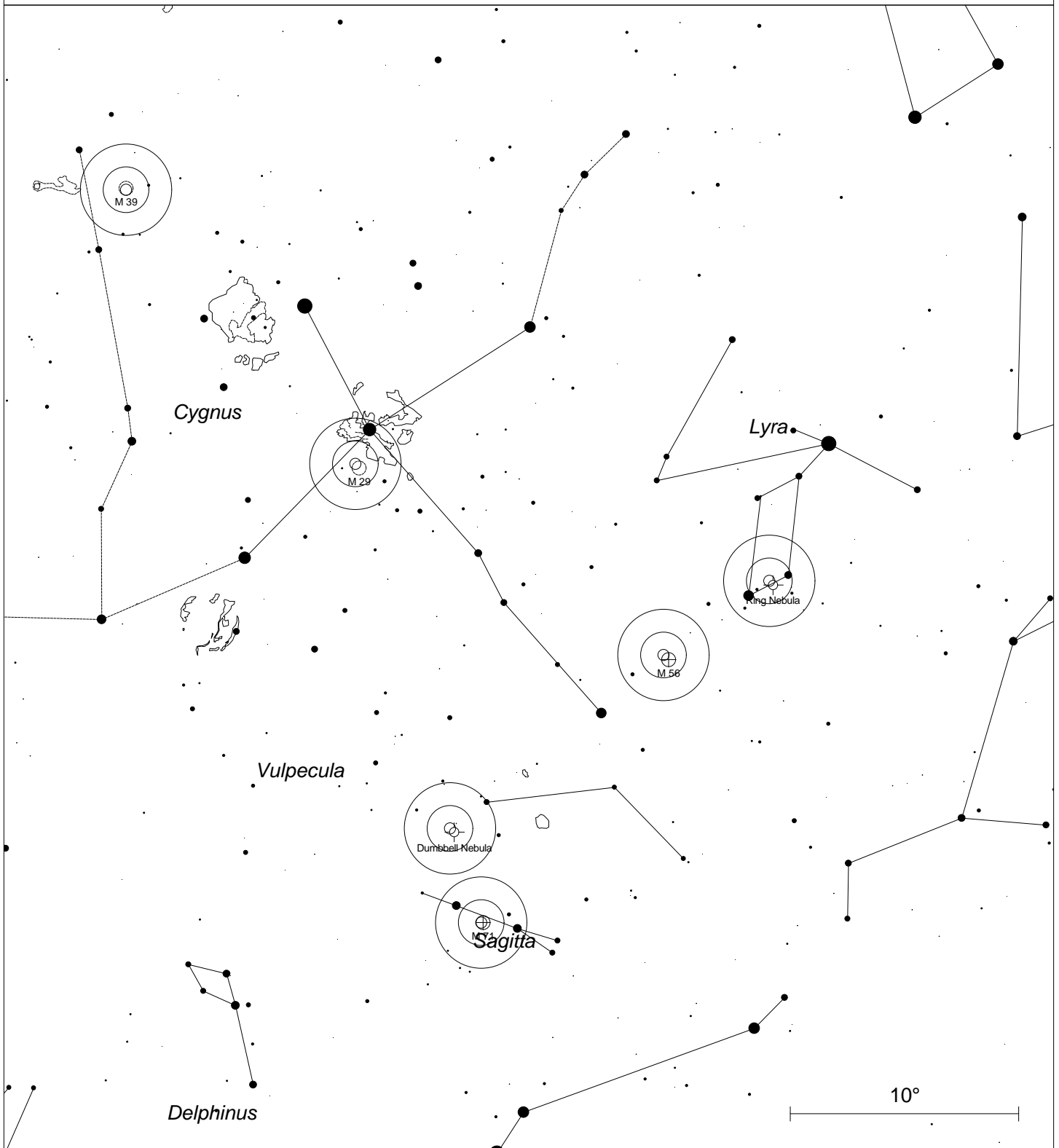
SYMBOLS

☄ Comet	⊕ Globular Cluster
♁ Asteroid	♁ Planetary Nebula
○ Galaxy	☐ Quasar
○ Open Cluster	○ Other Object
□ Bright Nebula	

Chart created using Sky Map 3.0  
www.skymap.com  
Chris Marriott, John Small



**MAP8**  
**LYRA, SAGITTA, VULPECULA, Cygnus**  
**M27, M29, M38, M56, M57, M71**



**STARS**

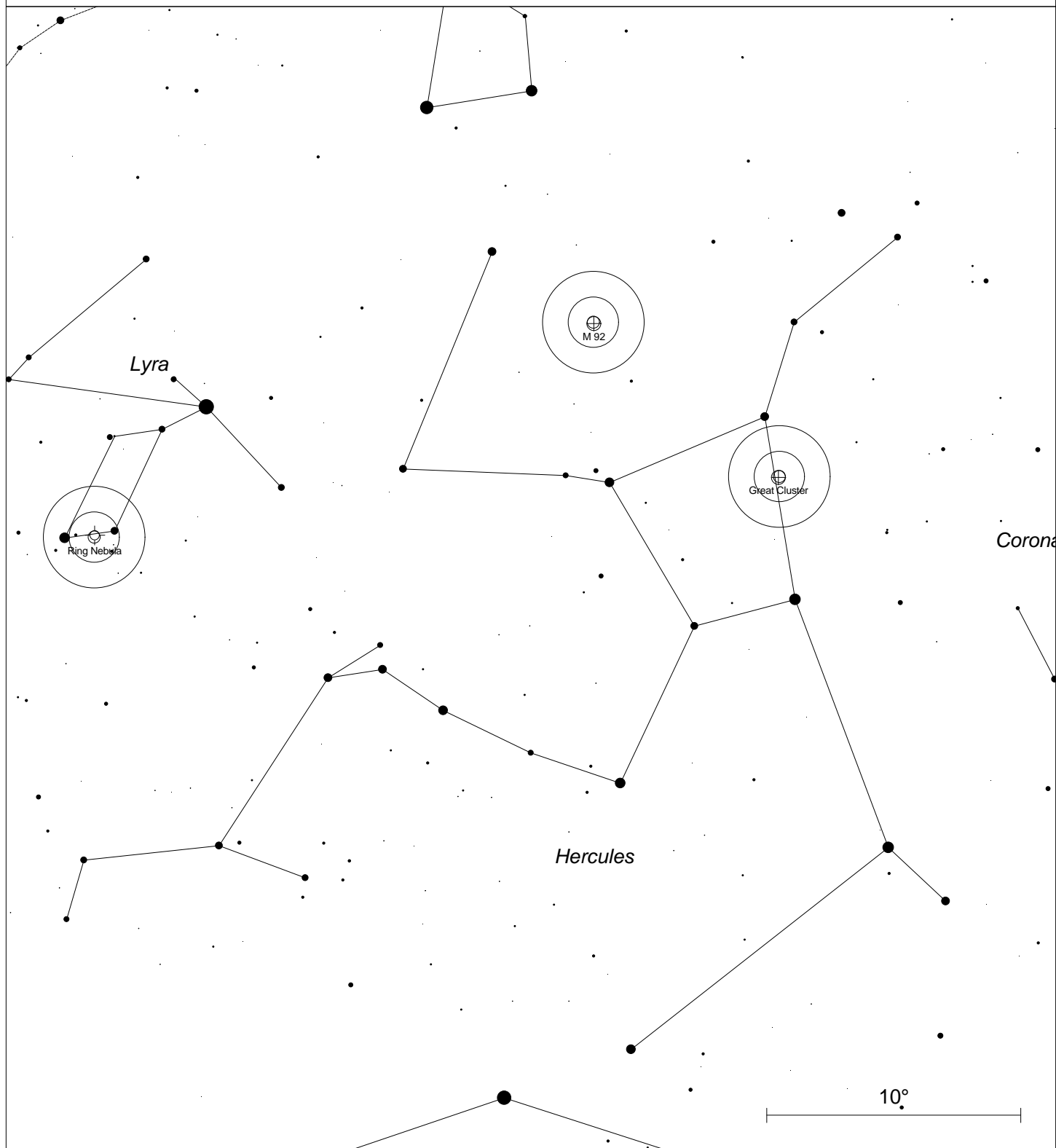
- |       |       |
|-------|-------|
| ● <2  | • 4.5 |
| ● 2.5 | • 5   |
| ● 3   | • 5.5 |
| ● 3.5 | • >6  |
| ● 4   |       |

**SYMBOLS**

- |                 |                    |
|-----------------|--------------------|
| ☄ Comet         | ⊕ Globular Cluster |
| ♁ Asteroid      | ⊙ Planetary Nebula |
| ☾ Galaxy        | ⊞ Quasar           |
| ○ Open Cluster  | ○ Other Object     |
| □ Bright Nebula |                    |

Chart created using Sky Map 3.0  
[www.skymap.com](http://www.skymap.com)  
 Chris Marriott, John Small

MAP9  
HERCULES, LYRA  
M13, M57, M92



STARS

- |       |       |
|-------|-------|
| ● <2  | • 4.5 |
| ● 2.5 | • 5   |
| ● 3   | • 5.5 |
| ● 3.5 | • >6  |
| ● 4   |       |

SYMBOLS

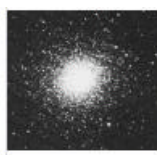
- |                 |                    |
|-----------------|--------------------|
| ☄ Comet         | ⊕ Globular Cluster |
| ♁ Asteroid      | ⊛ Planetary Nebula |
| ○ Galaxy        | ⊞ Quasar           |
| ○ Open Cluster  | ○ Other Object     |
| □ Bright Nebula |                    |

Chart created using Sky Map 3.0  
www.skymap.com  
Chris Marriott, John Small

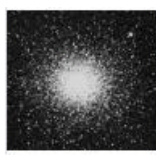
## Messier Object Thumbnails M1-M35



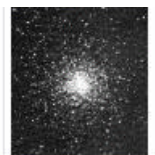
m1.bmp



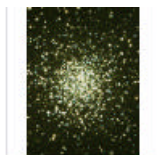
m2.bmp



m3.bmp



m4.bmp



m5.bmp



m6.bmp



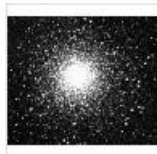
m7.bmp



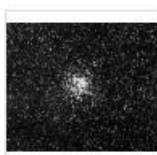
m8.bmp



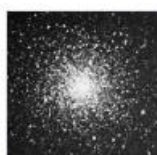
m9.bmp



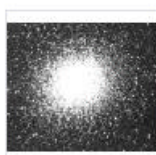
m10.bmp



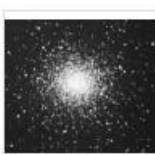
m11.bmp



m12.bmp



m13.bmp



m14.bmp



m15.bmp



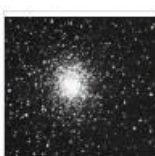
m16.bmp



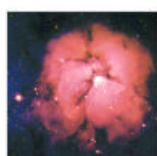
m17.bmp



m18.bmp



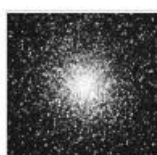
m19.bmp



m20.bmp



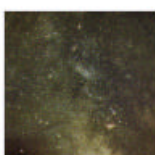
m21.bmp



m22.bmp



m23.bmp



m24.bmp



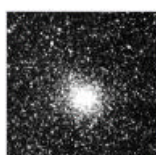
m25.bmp



m26.bmp



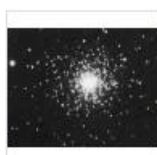
m27.bmp



m28.bmp



m29.bmp



m30.bmp



m31.bmp



m32.bmp



m33.bmp

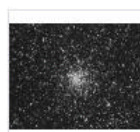


m34.bmp

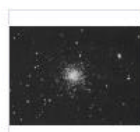


m35.bmp

## Messier Object Thumbnails M71-M110



m71.bmp



m72.bmp



m73.bmp



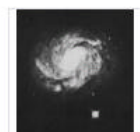
m74.bmp



m75.bmp



m76.bmp



m77.bmp



m78.bmp



m79.bmp



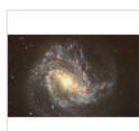
m80.bmp



m81.bmp



m82.bmp



m83.bmp



m84.bmp



m85.bmp



m86.bmp



m87.bmp



m88.bmp



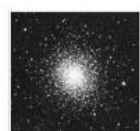
m89.bmp



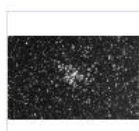
m90.bmp



m91.bmp



m92.bmp



m93.bmp



m94.bmp



m95.bmp



m96.bmp



m97.bmp



m98.bmp



m99.bmp



m100.bmp



m101.bmp



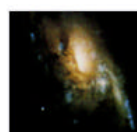
m103.bmp



m104.bmp



m105.bmp



m106.bmp



m107.bmp



m108.bmp



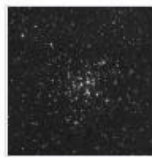
m109.bmp



m110.bmp



## Messier Object Thumbnails M36-M70



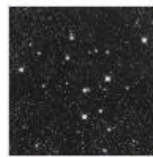
m36.bmp



m37.bmp



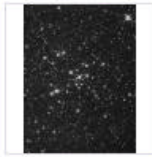
m38.bmp



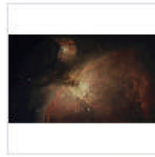
m39.bmp



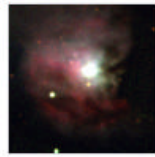
m40.bmp



m41.bmp



m42.bmp



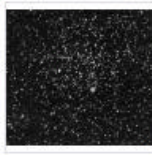
m43.bmp



m44.bmp



m45.bmp



m46.bmp



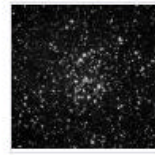
m47.bmp



m48.bmp



m49.bmp



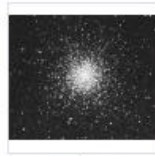
m50.bmp



m51.bmp



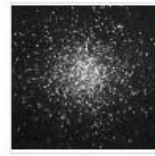
m52.bmp



m53.bmp



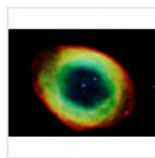
m54.bmp



m55.bmp



m56.bmp



m57.bmp



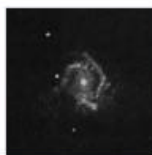
m58.bmp



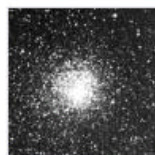
m59.bmp



m60.bmp



m61.bmp



m62.bmp



m63.bmp



m64.bmp



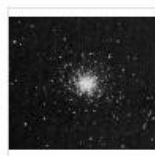
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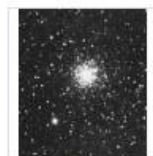
m66.bmp



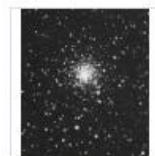
m67.bmp



m68.bmp



m69.bmp



m70.bmp