

## **100 Binocular Deep Sky Objects for Observing as Groups**

An observing list from the logs of Ed Zarenski

Sometimes we hear binocular observers ask, What is there to look at? Binoculars are useful for wide-field viewing and there just aren't a lot of wide-field objects to view, so where should I look? My answer to those questions is, You can look at nearly everything, but sometimes you just need a different way to look at things.

This Binocular Observing List has many Deep Sky Objects, all listed in groups, sometimes 3 or 4 in a group, but usually 2 objects in a group. Seeing DSOs in groups makes observing that much more enjoyable. Many of these objects are challenging and may not be seen unless observing with large binoculars or in very dark skies. In some cases I discuss what can be seen in various sizes of binoculars. Most of these observations are in reference to my best skies about mag 5.5 to 5.7, but many of these objects can be seen in skies brighter than mag 5. In all cases this observation list was compiled out of my field notes from binocular observing sessions at home.

This list is organized into object groups within areas of the sky, for example, the Cas/Cam/Per clusters. Some of my observing charts are linked. A knowledgeable use of charts and constellations would be helpful to find all these objects. Beginners may find this is a list they can grow with.

There are some very challenging DSO groups in this list. There are nearly 100 DSOs in about 40 groups in this list, and almost each one of those groups has a difficult challenge object. I can think of one object mentioned here, the planetary nebula in M46, that may not be visible in any binoculars, but I mentioned it because I know it's there, and some folks might push a BT100 up to 60x or more. There are only five or six objects listed here that I have not ever seen in a binocular; the western portion of the Veil, the Pipe nebula and the planetary in M46 among them. And yet, most of these objects can be viewed even in moderately sized binoculars. In fact more than half of all the objects in this list can be seen in a 10x50 binocular.

Following the DSO list are two more short lists. One list is about 10 Pairs of Binocular Doubles. That is, doubles that are wide enough to be seen in binoculars and are seen in conjunction with another wide double, for instance Stf 2470 and Stf 2474, the double Double's Double in Lyra. The other list is about 15 Double Stars Involved in Open Clusters. Once again these are selected because they are visible in binoculars.

All in all, this list contains about 140 objects in over 60 observing groups, enough to keep even a well-seasoned observer busy for a while. By no means is this a complete list of all the DSO groups that can be seen in binoculars.

I hope you enjoy observing these objects as much as I do!

edz

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## Galaxies Groups

M65 - M66 and NGC 3628 in Leo

While M66 and M65 are just seen in 16x70s and 20x80s, both are readily seen in the 25x100s. The companion NGC 3628, not seen in any smaller binocular, was visible several times in the 25x100. In 15x70s, M65 /M66 can be found easily with M65 being difficult, but the companion NGC 3628 will not be seen.

M95 - M96 - M105 and NGC 3384 in Leo.

In the 25x100s, M105 and its companion NGC 3384 make a nice pair. 3384 not seen in smaller binocs. M96 is seen, but M95 remains difficult in 16x70s.

M58 and M60 in Virgo

A separate category is needed for all the galaxy pairs in the Virgo/Coma Area that include some extremely difficult NGCs. (I need a detailed chart handy to name those), but even when I can't find most others, I can see M58 and M60, because they are located just north of a triangular asterism with a bright star in its center. I have seen M60, and the pair M84 / M86 in 10x50s.

M81 - M82 in Ursa Major

M81 and M82 are seen as a pair except at high powers. In one recent observation, both had distinct core and extension. There are two nearby difficult galaxies, NGC 3077, just 1° se and NGC 2976 1.5° sw of the bright pair. Both can be seen handheld in a 10x50.

M31 – M32 – M110 in Andromeda

Using the 16x70 Fujinons, I found M31 in daylight/dusk about 20min before darkness. M31, the Andromeda Galaxy. Extension of about 1\* to 1 1/2\* in the 15x70's and 1 1/2\* to 2\* in the 20x80's. M32 always seen in combination and M110 sometimes seen in combination. One night M31 filled 40% of the 5° fov of my 12x50s.

## Galaxy/Nebula

M108 -M97 in Ursa Major

A difficult pair even for some larger binoculars. M108 has an unusual mottled look for a galaxy. M97 is the brighter of the two objects. M108 needs a good dark sky and a 25x100.

## The Cassiopeia / Perseus Clusters

NGC 457 and 436 in Cas

The large bright Owl Cluster and the extremely faint and small nearby cluster 436 offer a deep contrast. 457 is easy. 436 is visible in 15x70.

NGC 654 - NGC 663 and NGC 659 in Cas

663 is fairly good sized, but the other two are small and one of them is quite faint. Two more cluster lie very nearby, M103 and Tr1. All are visible in 10x50, although Tr1 is tiny. Even in a 10x60, 659 needs good skies. It has no stars brighter than mag 10.4. 654 is barely seen as non-stellar and 663 is large and fairly bright with a few resolved. In a 15x70, 659 is seen but just very faintly, 654 has one bright star to the south with a faint glow to the NW and 663 has several pairs resolved with a faint glow all around them.

In the 25x100, 659 is resolved to 2 or 3 stars with a small round faint glow, 654 has faint stars that make the glow to the NW look grainy at best, like a fan spreading out from the single bright star and 663 has at least 15 stars resolved, several seen in pairs and surrounded all around by a wide glow of 60 unresolved stars fainter than mag 10.

NGC 869/NGC 884 and Stock2 in Cas/Per

The famous double cluster and Stock 2, an incredible threesome. The Double Cluster is stunning in 20x80's with extended resolving in both clusters. In the 4.3\* fov of the 15x70's, the double cluster is seen in concert with St2.

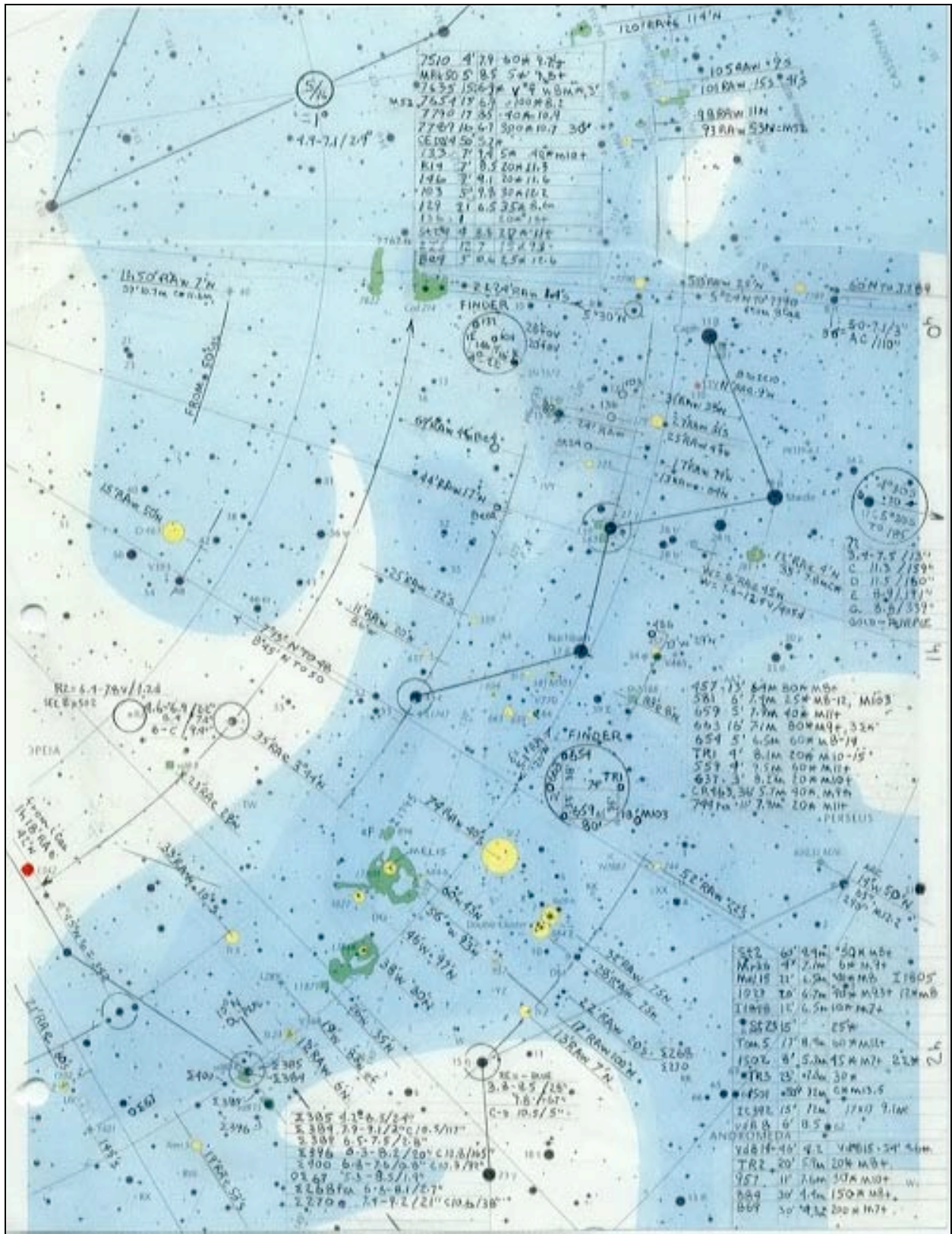
Mel 15 and NGC 1027 in Cas

These two clusters reside not far north east of Stoch 2. They will fit in the field of a 20x80 binocular. Although not particularly easy to find, both clusters show well against the field background. Mel 15 is embedded in the vast area of nebula, I 1805. Mel 15 is pretty large and has a mixture of stars of different magnitudes. The entire area within Mel 15 seems lighted with a faint averted vision background glow. Besides Stock 2 and the Double Cluster, this is probably the largest cluster in this region. Due east of Mel 15 by about 2° is the cluster NGC 1027. Similar to Mel 15, 1027 is made up of stars with mixed magnitudes. Like Mel 15, NGC 1027 has a lot of very faint background stars. This can be seen as a faint background glow within the cluster.

Kemble's Cascade and NGC 1502 in Cam

a nice asterism and a cluster with a binocular double at it's center. Struve 485 is an even mag 7 double at 18". This is an easy pair for a 10x50. NGC1502 is like the pool of water at the bottom of a flowing stream. The stream is known as Kemble's Cascade, a 3°-4° long string of mag 8 and mag 9 stars. This is a beautiful binocular sight.

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## The Cygnus Milky Way

NGC 7000 the America Nebula Complex.

Besides the sheer beauty of the naked eye Milky Way, I think the best dark sky object in this area is NGC 7000, the North America nebula. In a mag 6.7 sky, this outstanding deep sky feature stood out in 15x70s like I have never seen it before in any optics. The entire Florida / Gulf of Mexico / Central America region was the brightest and most obvious. In a mag 5.5 sky, it was not visible in the same 15x70s. On rare occasion, I have suspected seeing a portion of the adjacent Pelican nebula.

M29 and the group of small clusters

M29 is close to Gamma Cyg and just sw of there is Be86, IC4996 and Bas6.

Another group is NGC 6871, Bi2 and NGC 6883. Several of these clusters have doubles within. These are difficult clusters for a 25x100. These all lie just south of the center of the cross, between Y Cyg and Eta Cyg.

M39 and NGC 7082

M39 has stars much brighter than the NGCs mentioned above. It forms a distinct triangle and with a few stars just outside the limits of the triangle, I could count 29 stars in the cluster. Nearby to the south is o.c. NGC 7082, less obvious, but fairly easy to identify. It could be observed in the same 2.3° FOV as M39.

Double Star 16 Cygnus at 39" and planetary nebula NGC 6826.

16 Cyg is an easy double star even for a 7x binocular. In NGC6826, when looking just off to the side, the planetary did blink in and out of view. It was obviously fatter than the stars in the fov. This planetary observation was with 25x100.

NGC6992-95, the Veil Nebula

the eastern peanut shaped portion of the Veil Nebula can be seen with 15x70s under a dark sky. The star 52 Cyg is embedded in the western portion.

Struve 2738 and globular cluster 7006 in Del

Double star Struve 2738 at 15" and globular 7006 in Delphinus. The double is tough with a 2 mag difference but is easier than the globular. NGC 7006 was not seen in any binocular smaller than 22x100. In one observing session, I remarked in my notes, along with M101 and M74, this globular is the faintest object I have observed!

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## Clusters, globular and nebula in Vulpecula and Sagitta

Albireo, Stock 1

Double star B Cygnus, Albireo is the southern end of the Cross. Open cluster Stock 1 and the pair 6 and 8 Vulpecula lies only 3-4° south and less than 2° apart. This is a good pair for a 10x50.

NGC 6885 – NGC 6882

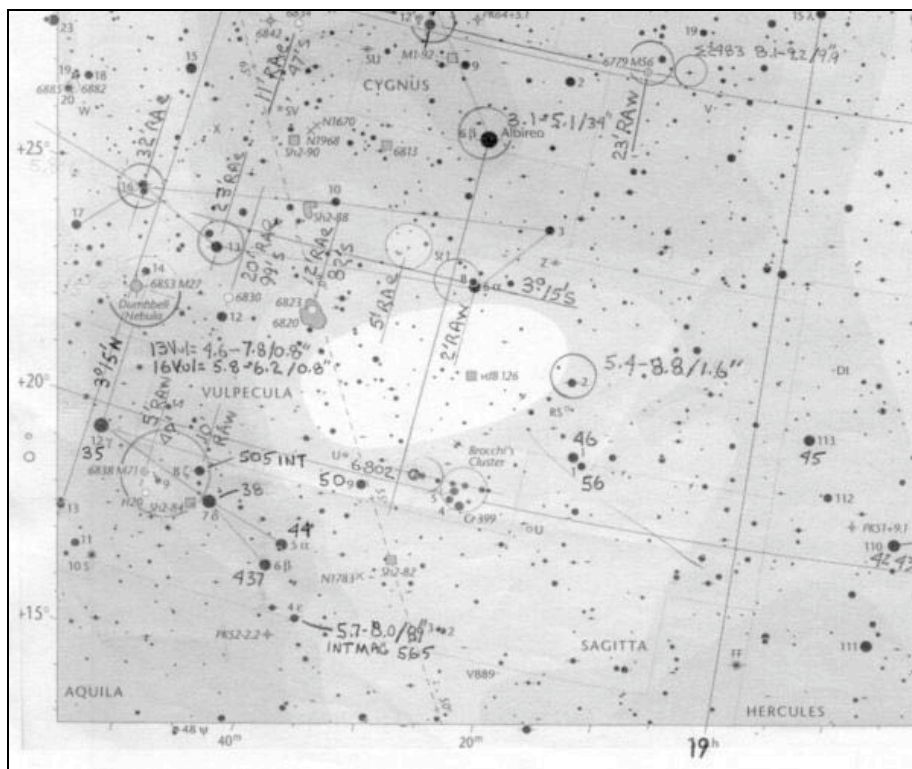
This pair of open clusters is in Vulpecula. This pair will be difficult for some to distinctly separate even with 25x100. They are just east of Stock 1 East of these is the broad but faint open cluster 6940.

Globular M71, cluster H 20 and nebula M27

Globular cluster M71 lies near the center of the little constellation Sagitta. M71 is faint even in a 15x70. This particular globular cluster may be one of the youngest globulars. Some even say it is either a very loose young globular or a very old distant open cluster. I see it as a difficult object to resolve in any case and 20x80s showed it as just a faint irregular glow. The open cluster Harvard 20 is less than half a degree sw of M71. I have only suspected seeing Harvard 20 in 25x100 binoculars.

The nebula M27 is not far away and is visible together with M71. M27 is less than 4° north of the tip of the arrow. In a 10x50 you can see M27 and M71 with Sagitta.

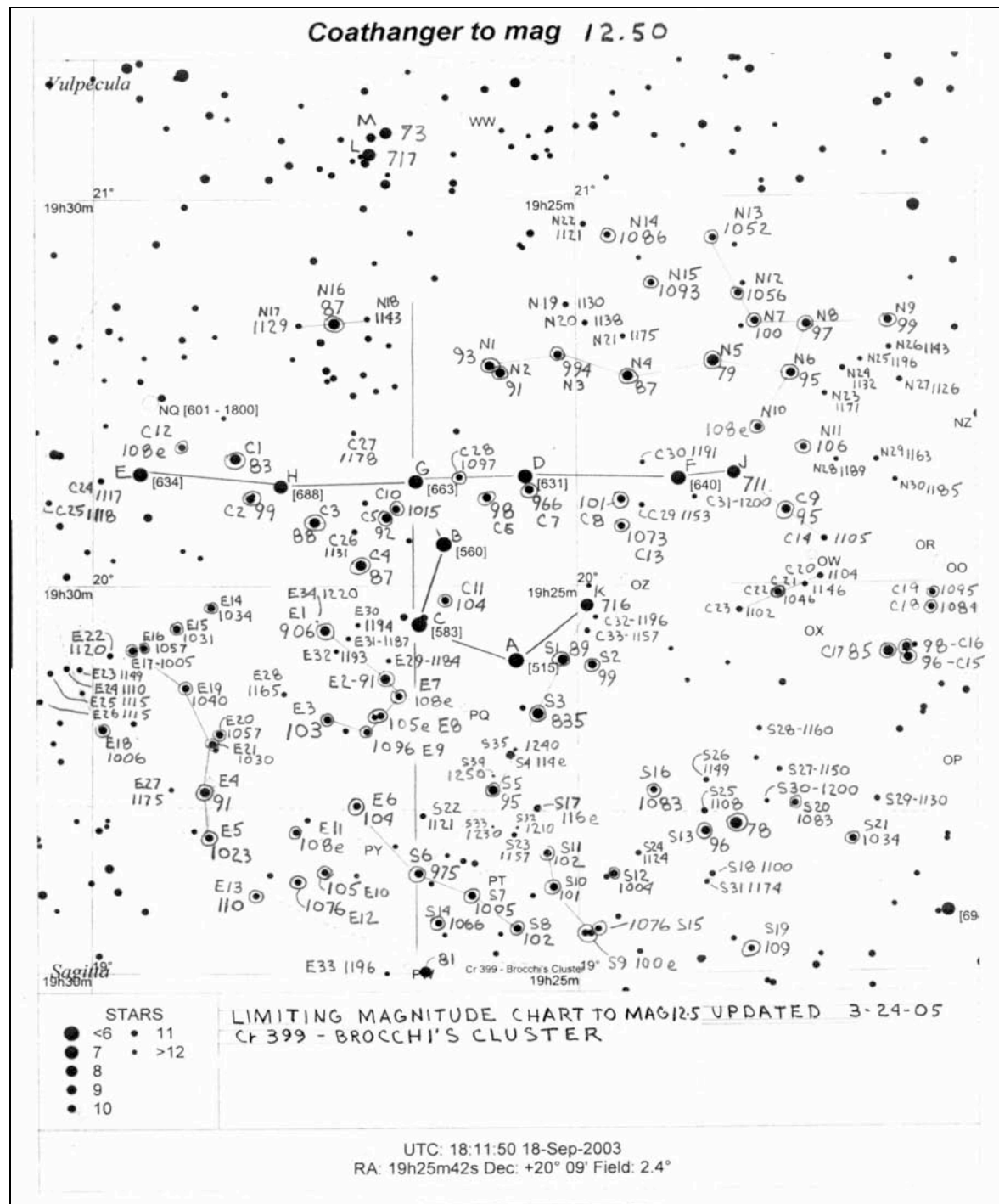
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### Detail in Cr399, the Coathanger Deep Magnitude Chart

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the deep magnitude chart highlights strings of star groups. I find it easiest to observe these detailed charts when I follow the patterns. Eventually you will pick your favorite patterns and you will know some star magnitudes as a quick test.





### Asterisms in the Pleiades

From the M45 detail chart showing stars to mag 13

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These are found in section B on my M45 chart. Both the Dinosaur and the Orion asterisms have a mag 10.5 star as the faintest star. The head of the dinosaur is difficult.

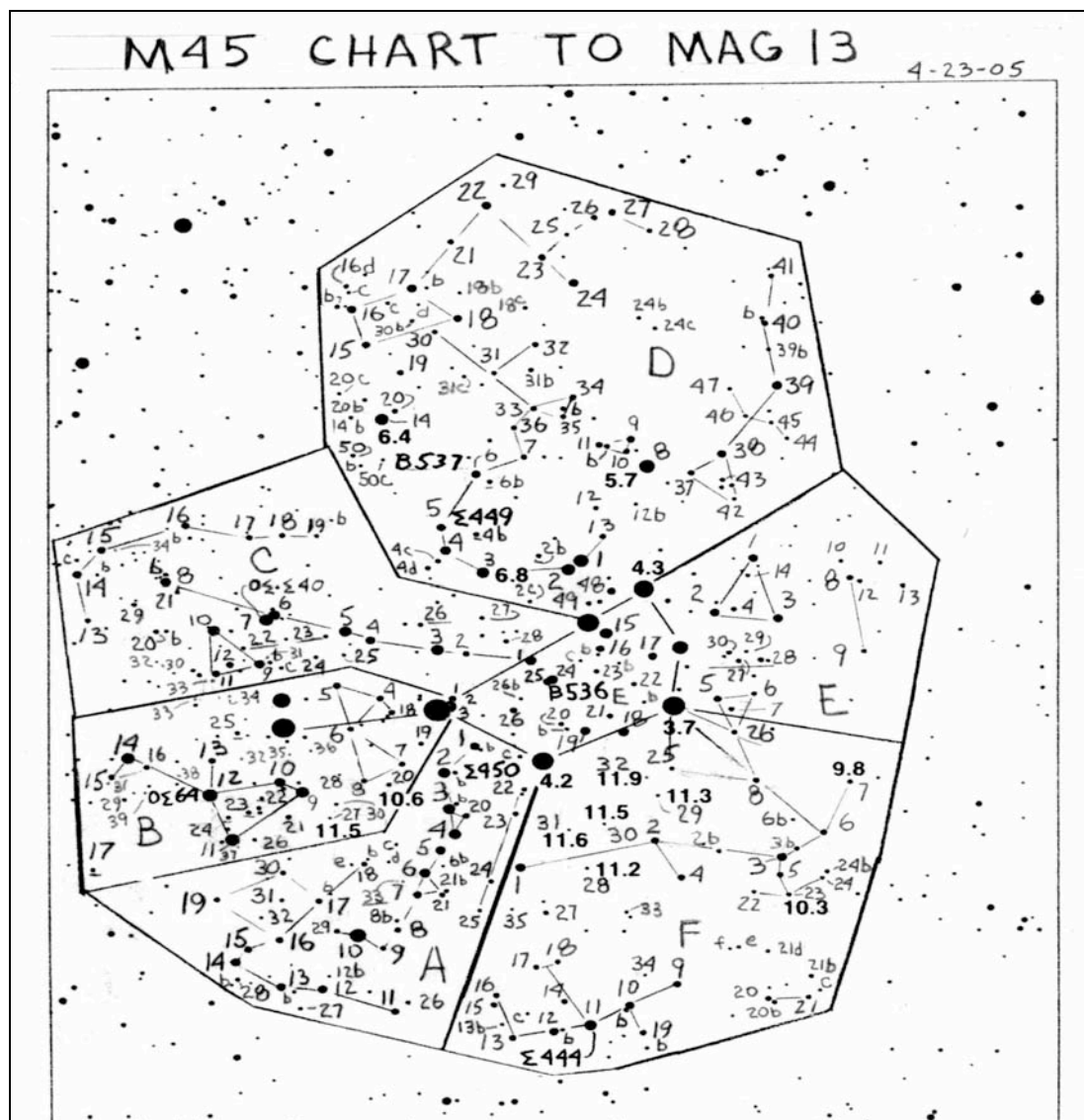
the Dinosaur asterism - B9,10,11,12,13,14,15,16

the Orion asterism - B4,5,6,7,8,18

The Lizard asterism is found in section D. The line of the body is mag 10. The head and legs reach mag 11.

the Lizard asterism - the body D37,38,39,40,41;

the head and eyes D42,43; the legs D44,45,46,47.



## The Scutum Serpens Ophiuchus Area

Open Clusters NGC 6663 and IC 4756 in Serpens

Open clusters IC 4756 and NGC 6633, on the northern Scutum/Ophiuchus border, are seen together as an attractive picture in a 4.3° 15x70. The wide field makes the scene. In a 25x100, far more stars are seen, 4756 has a mottled gray white background. The number of stars is countless, but the clusters cannot be seen together at 25x100. Although the 25x100 has the detail, the 15x70 has the nicer wide field view. IC4756 was observed in the BT100 with 20Tvplossls at 31x. It was surrounded by about 8 bright stars and densely sprinkled with faint stars. I counted over 100 stars at 31x100, with moonlight in the sky. Nearby 6663, 3.5° to the nw, is a completely different style of cluster, open with many more bright stars. It's hard to understand why these two were never selected as Messier Objects.

## Clusters, Globulars and Dark Nebula in Scutum

M11 - M26 - NGC 6712 - NGC 6664 in Scutum

M11 – R Scutii, Stf 2391 and HVI 50

All in one field of view we have a dense open cluster, two double stars and a variable.

M11 looks like a globular. The dense open cluster M11 is right next to a pair of double stars and the variable R Scutum. The data for R Scu is 4.9 to 8.2 / 140 days. Oddly enough, for the many times I've observed this area, I've only just recently seen R Scu near minimum. There are three nearby stars that, with R Scu, make a slightly misshapen trapezoid. The double stars are Stf 2391 at 6.5-9.8/38" and HVI 50 at 6.1-8.6/114". There is a mag 7.1 single star fainter than both of those doubles. Then there is R Scutum.

Just north of M11 is a broad Dark Nebula. Just west and south of M11 are small dark nebula patches.

In the area 3°-4° south of M11, M26 is seen easy in the 16x70s but 6712 and 6664 are not seen at all. In 20x80s, globular 6712 is seen and in 6664 only 3 or 4 stars can be glimpsed. In both 22x100s and 25x100s 6712 is seen readily and 8-10 stars can be counted directly in 6664.

## Globular Cluster Pairs

Globulars M10 and M12 in Ophiucus

25x100s make globular cluster M12 look like it is on the verge of resolution in the outer edges. 16x70s could not resolve M12 at all. The BT100 at 36x did in fact provide some resolution in the outer edges of M12. M10 is brighter and has a brighter core. M12 although fainter, was larger than M10. Both can be seen in 12x50s. M12 is barely seen in a 10x50.

Globulars M9 and NGC 6539 in Ophiucus

M9 is small and globular 6539 to the ne is very faint like a galaxy.

Finding M9 and 6539 was easy in 22x100 and 25x100 but not so easy in the 16x70s.

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### **Nebula / Clusters in Sagitarius**

M16 - M17 - M18- M24 in Sagitarius

This is a beautiful collection of clusters and nebula, in a region of the sky that could keep you busy for hours. To see M16-M17-M18 all at once in a scope, you'd need a 4\* fov. I suppose you could take a fast wide field scope and pop in a long wide field eyepiece to get an incredible low power wide field view. But that's pretty much what we do with binoculars, and we get to do it with two eyes. can be seen in 10x50.

M16 is noticed in small binoculars because of the embedded cluster. On M17, the nebula was by far the best in the 25x100s, an up-side-down swan. In the 20x80s, M17 was seen but not with the same size and brightness. In all smaller binoculars, M17 appeared smaller with much less prominence. When observing the area of M16-M17, just below them the oc M18 looks like a small glow. And just south of all these is M24 the vast Sagitarius Star Cloud. Lined up at the south end of the star cloud allows you to look 4° E for M25 and 5° W for M23.

South of this is a vast array of objects, I'm sure some of which can be seen as groups, in Scorpius/Sagitarius, an area that I can't rattle off targets for because I don't get to see it much below my trees. Another whole guide list needs to be written just for this area.

### **The Merope Nebula and the Pleiades cluster**

I've observed M45 with Fujinon 10x70s, Orion 16x80s, Oberwerk 15x70s, Fujinon 16x70s, Oberwerk 20x80s, Oberwerk 25x100s and many others. I've looked hundreds of times with 20 or 30 different instruments. None of them showed the Merope nebula. The first time I've ever recorded seeing the Merope nebula in M45 was with an Oberwerk BT100 using a pair of 26mm TV plossls = 24x, exit pupil = 4.2mm. Not only does it take good skies and a high quality instrument, but it takes persistence! The bright portion of the Merope nebula extends southward from the star Merope, the bottom of the little cup below where the handle attaches.

### **M36 – M37 – M38 The Auriga Clusters**

Spend some time really observing the different structure of the clusters in Auriga. They span a full 6°, so as a group they are only seen in lower powered wide field binoculars such as can be seen in 10x50.

That noticeable asterism formed by 14, 16, 17 and 18 Auriga is always my guidepost for jumping up to M38. It points almost right to M38. In 20x80s, M38 was really quite spread out. Its stars are pretty faint, with the brightest only mag 9.5. So, it loses its appearance of a cluster with star glow. In the 10x60 I could still see a more compact cluster with a glow of stars. Too much magnification can make M38 almost disappear.

Only wide-field binoculars will permit seeing across the entire field from M38 to M37, although a higher power binocular will permit viewing them two at a time. The noticeable asterism formed by 14, 16, 17 and 18 Auriga is always my guidepost for jumping up to M38. It points almost right to M38.

#### **M38 - NGC1907 in Auriga**

M38 has stars that are spaced openly. All the stars are pretty faint, probably the reason why so many can't seem to find this cluster with mid-sized binocs. It has many stars easily seen, well spaced and all evenly bright, but all pretty faint with the brightest star only mag 9.5. In 20x80s, M38 is really quite spread out. So, at 20x80 it loses its appearance as a cluster with star glow. In a 10x60 you will still see a more compact cluster with a glow of stars. Too much magnification can make M38 almost disappear. M38 has a very small distant cluster nearby, NGC 1907, visible in 25x100s. A closer observer may also find a nearby planetary nebula.

M36 is much different. It is very compact, with stars tightly grouped. It's difficult to separate the stars with mid-sized binoculars. On M36, a 15x70 can separate 4 to 6 stars, 20x80 6-7\*, Fuji 16x70 saw 8-11\*. A glow is readily apparent because about 10-15 of the tightly packed stars are pretty bright. A 25x100 can see about 20 stars. In the BT100, M36 was fully resolved with a very tight double right at the center. M36 has 15 stars between mag 8.9 and 10.65. I saw 22-23 stars resolved.

M37 is the most impressive of the three. It is large and very densely populated. The stars are mostly evenly bright, but none except only one is very bright. Anything that can be resolved is seen across a bright, diffusely lit background. Mid-sized binoculars have a difficult time resolving the dense cluster. 25x100s can resolve maybe 40 or 50 stars, but they are so tightly packed they can't be counted. Using the BT100 with a pair of 12.5mm UO orthos at 50x, I could not count all the stars seen in M37. No need to count them! Just sit back and enjoy the view.

### **Winter Cluster Pairs**

M35 / NGC 2158 pair in Gemini

M35 is almost like a natural extension of the row of clusters through Auriga. When observing M35 with 25x100s, I noted distinctly a tiny patch of glow just to the sw, the location of the very distant open cluster NGC2158. M35 was also well resolved. It has more of a bright/faint mix like M36, only it covers a much wider area and has many more than M36.

NGC 2169 and NGC 2194 in Orion

Up in the arm of Orion, I almost always find NGC 2169. 2169 has a few bright stars about mag 6-7, so it shows itself pretty well. But only about 2° to the SE is the far more difficult 2194.

Many times I simply cannot see this cluster. A very faint spot just off the north from the two bright guide stars I use to find it. It's nice to see this one as I seldom get the chance.

M46 - M47 clusters in Puppis

vastly different styles of clusters in the same view. And the bonus goes to those observers who can see the 7" double at the center of M47 and (if it can be done) the planetary nebula in M46.

The double at the center of M47 is Struve 1121, with components of 7.9-7.9/7.4" and it was cleanly split at 25x. M46 is a very faint fuzzy spot in a 10x50.

NGC 2244 cluster/nebula in Monoceros

the Rosette nebula and cluster 2264 are identified together. It's an easy cluster. It looks like a miniature Gemini, but it is an extremely challenging nebula. In my mag 5.7 skies I've only seen it with the BT100 and 26mm TV plossls at 24x.

### **Bright Nebula**

M42 - M43 - NGC complex in Orion Orion's Sword, and the Trapezium.

Observe this group of nebula and try to split the Trapezium into 4. In the 16x70s AB/8.7" is elongated and not split, but C, D, AB appear clearly as three components of the famous quad. Surrounded by the gaseous glow of M42, this may be the most visually stunning multi-component system in the galaxy. All are split with 20x80s.

M42 and M43 together make what looks to me like a bird in flight. M42 is the outstretched wings and M43 is the small round head. In a 20x80, extension in the nebula is broad, all the way out to the wing tips and tail. A 20x80 is enough binocular to fully resolve the four components of the trapezium. The closest two, AB being 8.7" apart, are seen tilted slightly away from being parallel to the others.

The top of the sword is the cluster NGC 1981. A very nice bright cluster, its like the glittering jewels that adorn the sword. The tip of the sword has the brightest star, but also has the fainter double star Stf 747. At 4.8-5.7/36" this is an easy double for any size binocular. At 20x it was very wide.

### **Dark Nebula**

The pair of DN just west of gamma Aquilla. B142 south and B143 north, dark empty spaces in the rich Milky Way adjacent to gamma Aql.

The famous pipe nebula on the Scorpius / Ophiucus border, lies north of M6 and M7.

### **Large Area Objects**

These Objects are included because they should not be overlooked.

Alpha Perseus Association

Orion Association, the belt

Cygnus Milky Way

Hyades

Virgo Galaxy Cluster

NGC 7000 the North America Nebula

Orion Nebula Complex

Andromeda Galaxy Group

Veil Nebula

**Pairs of Doubles**

Struve 2470 and 2474 in Lyra,

The Double Double's double. These are Stf 2470 and Stf 2474 just to the east of the parallelogram. Both are very uneven and both are pointed west. Their separations of 13.4 and 16.2 respectively belie their difficulty. These are pretty faint pairs. Stf 2474, 6.7-8.8/16.2" is the southerly pair. Stf 2470, 6.6-8.6/13.4" is the northerly pair. Both were very clearly separated in the 20x80. They were both seen as separated in 16x70 Fujinon's with difficulty. These were not seen in a 12x50.

Struve 2391 and HVI50 in Scutum,

Easy, both wide, both in the same low power view with M11 and the variable R Scutum.

Struve 232 and 6 Aries,

Easy, a mag8 double at 6.6" and a 3.9" double with color. Stf 232, about one degree north east of 6 Tri, is 7.9-7.8/6.6". At 24x, all I could see was elongation, but with the 20TVplossls at 31x, this double was clearly split. It's fairly faint, so it's a bit more difficult to hold the view in the eye. With a 17mm Sirius plossl at 36x, it was an easy double. 6 Tri is much closer at 5.3-6.9/3.9", but is visible at 44x in the BT100.

Struve 953 and Struve 954 in Monoceros

Struve 953 7.2-7.7/7.1" was an easy split with 25x100. It's about 1/2° south of the tip of the Christmas Tree cluster. In a 20x80 binocular I can only elongated this fairly even mag7 double. Struve 954 7.1-9.6/12.8" is at the very tip of the tree. Although this one is much wider, it eludes the 25x100 binocs. I've tried many times but have not captured it at 25x. I had the BT100 set up with a 14mm radian giving 44x. The secondary of Struve 954 was even a little difficult for the BT100 at 44x.

Io (21) and Kappa (17) Bootes

Near the end of the handle of the Big Dipper. Io is 4.9-7.5/38" and kappa is 4.6-6.6/13.4", not easy because of the 2 mag difference, but you can see it with a 15x70.

83 and 84 Leo

about 10° south of M65/M66. 83 is 6.2-7.9/28" and 84 is 5.1-8.0/91"

Gamma (12) Delphinus and Struve 2725

Gamma Del, at 4.5-5.5/9.6" the point star of Delphinus, is a double I look at almost every time I'm out. It is an easy double for a 20x80, but will be difficult for a 15x70. Gamma has been cleanly split with a 16x70 Fujinon. I had hoped to see it elongated with the 10x60 but it did not show itself. In the 20x80 it was clearly separated. A little below  $\gamma$  Del is a much tighter double, Stf2725, at 7.6-8.4/5.8", a challenge even for a 25x binocular. I noticed it elongated in a 20x80.

10 Mon is a nice triple, but it's the difficult B-C that I was after. A-B is 5.1-9.3/77" and A-C is 5.1-9.3/81", but due to the PA of each, BC is 9.3-9.3/21". This makes a nice triple, difficult in smaller binoculars. It was readily apparent in the 25x100.



**Double Stars within Open Clusters**

Here's the doubles culled out of my binocular list that all fall within open clusters. Many closer doubles are not included here since this list only went down to about 6" for binoculars to 25x.

The Trapezium, the famous multiple at the core of M42, is in the Orion nebula  
41 Ori, theta 1, Trapezium ABCD, A-B= 8.7", A-C=12.9", C-D=13.3", B-D=19.2"

34 Cas, Phi, AC 5.1-7.8/134", the eyes of the Owl Cluster, in NGC 457

Stf 485, Cam 7.0-7.1/18", 4h05m +61n, easy, in o.c. 1502

17 Com, 5.3-6.6/145", in Mel 111, Berenices Hair

11 Lyr, Delta1, 5.6-9.3/175", in Steph 1

B440, Cyg, probably seeing AF, 6.8-7.8/36", 20h07m +36n, in o.c. 6871

Stf 2624, Cyg, AB is 7.2-7.8/1.7", AB-C is 9.1/43", 20h04m +36.5n, seen as 6.7-7.8/43", in o.c. B146

56 And, 5.7-6.0/190", on the edge of o.c. NGC 752

S 445, Per, 7.3-8.2/74", 4h20m +50.5n, in NGC 1545

B536, Tau, AB-C, 8.1-8.0/39", in the center of M45, The Pleiades

10 Mon, 5.1-9.3/77", C=9.3/81", BC= 9.3-9.3/21", outstanding triple in o.c. 2232

Stf 1121, Pup, 7.0-7.5/7.4", 7h38m -24s, easily separated at 25x, in o.c. M47,

39 Cnc, 6.5-6.5/150", Aa=8.9/134", Ab=9.2/135", brightest stars in north core of M44

Sigma Mon (15 Mon) in o.c. 2264 the Christmas Tree cluster in Monoceros. Sigma Mon the base or trunk of the Christmas Tree, has eight components, widely spaced.

Struve 848 Orion, in o.c. 2169 the Butterfly Cluster in Orion's upraised arm

Stf 2816 is in o.c. IC 1396 in Cepheus. Both the great bright nebula and the open cluster within have the same designation.