

## The Chatfield Binocular Challenge List Expanded

In 2004, I decided to observe the entire *Chatfield Binocular Challenge* list, but with a different perspective. Many observers simply find the object that they are searching for, check it off, and then go the next challenge object on the list. But with the Chatfield list, binoculars have a large field of view as compared to most of the object that are being hunted. So, for many objects, other interesting deep-sky objects may appear within, or nearby, the fields. It is a shame not to take the time to enjoy them along the way.

When I applied for my Messier Certificate many years ago, I was criticized by the awards committee that my first and last Messiers were observed 37 years apart, and that “*the observations were done over an unreasonable amount of time!*”

“*Well, what’s the rush? I also observed the Finest NGC’s and the Herschel 400 along the journey,*” I retorted. They shrugged and awarded the certificate anyway, and so will yours be, no matter how long you take to doddle around looking at all the other wonderful objects along the way.

As I was observing the *Chatfield Binocular Challenge* list I decided to keep really good notes and then to use those notes to write articles in the July/August, September, October and November 2004 issues of *Saskatoon Skies*. Those articles are attached, and using them and a good star atlas, you can expand your journey as you complete this certificate.

**Richard Huziak**  
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# The Chatfield Binocular Challenge – Part 1 by Rick Huziak

Over the last few months I decided that I should do a bit more deep-sky observing, so decided to do the Chatfield Binocular Challenge using 8 x 50 binoculars. I have found that since I was observing a much wider field (approximately 5-degrees) that I tended to take more notes about the interesting areas surrounding the target objects. It should be noted that the descriptions currently given on the Binocular listing are actually telescopic descriptions. The descriptions through 8 x 50 binoculars are markedly different. I hope that my descriptions will help new observers first find the Chatfield objects, but also learn a bit about observing – seeing more than just the target object and spending time in a field to discover everything about the object and everything around it as well.

The 4-part series of articles will explore 10 Chatfield objects each month, although 71 different objects are described altogether.

**ANDROMEDA – M31 (NGC 224)** – Our closest spiral neighbor is a very nice sight in binoculars. It is very large, running 1/2-degree wide by 4-degrees long. This is 8 times the size of the moon! In a 5-degree binocular field, the arms fill almost the entire width. The nucleus is very bright, but is not star-like at this power. Within the glow of the disk, M32 (NGC 221) is visible as a faint splotch. Also nearby at the edge of the field is M110 (NGC 205), a very ghostly oval smudge.

**ANDROMEDA – NGC 752** – NGC 752 is a large, 1-degree diameter fuzzy ball with maybe fifty 9th and 10th magnitude stars. There is an asterism of about 5 stars forming a golf club shape to the SW, with the tip of the club being a wide double. Due to this asterism, the common name for this area is the “Club & Ball Cluster”, with NGC 752 being the ball.

**AQUARIUS – M2 (NGC 7089)** – This globular cluster is small in the field – only about 3' in diameter, but at 7th magnitude it can be easily found. The fuzzy spot is slightly brighter to the middle. The field is barren, except that M2 is at the SW end of a right angle pattern of stars that extends 3-degrees NE then turns NW for 3-degrees. The pattern contains 24, 25, 26 Aquarii.

**AURIGA – M38 (NGC 1912)** – M38 is a wonderful open cluster found by scanning NE from the line of bright stars, 16, 17, 18, 19 Aurigae. It is a bright and large fuzzball, about 1/4-degree in diameter that breaks up into 20 to 25 9th magnitude stars if the binoculars are held steady. If you know exactly where else to look in the field, another open cluster, NGC 1907, can be barely spotted just S of a line formed by two horizontal 7th magnitude stars that just touch the SE and SW flanks of M38. At the SE edge of the field is M36 (NGC 1960). M36 is different from M38 in that it is concentrated to the center and is only half the size, though it is the same total brightness.

**AURIGA – NGC 2281** – This open cluster is found by drawing a line from alpha (Capella), though beta Aurigae, then extending the line one distance to the east. Here you find the loose asterism formed by psi-1 through psi-7 Aurigae. Just 1' SE of psi-7 is NGC 2281. The cluster is a nice fuzzy spot 1/4-degree in diameter with a tight double star at the center. Approximately 15 stars can be distinguished to 9.5 magnitude.

**CAMELOPARDALIS – KEMBLE 1** – This object was first described in a 1966 issue of *Sky and Telescope* by Saskatchewan amateur Fr. Lucien Kemble. Walter Scott Houston, the observing editor of the magazine coined the object “Kemble’s Cascade”. In some catalogues, the cluster is also known as Kemble 1. Although Lucien never made a catalogue of objects, this cluster and another asterism, Kemble 2 are perpetuated in the databases. Kemble’s Cascade is a very interesting string of about 16 stars, immediately obvious through binoculars. It will run almost the entire breadth of the binocular field in a very straight line of 7 to 9.5 magnitude stars. In the middle is a single 7th magnitude star and to the W is a line of three 7th magnitude stars that can be used as a guidepost to find this asterism. NGC 1501 is an open cluster found at the S end of the Cascade. It can be seen as a 5' wide ball of about 5 stars with a bit of fuzz around them. The Cascade runs from SE to NW.

**CANCER – M44 (NGC 2632)** – The famous Beehive or Praesepe Cluster is an excellent binocular object. More than 50 stars can be easily counted in this star cluster, one of the nearest to the earth. The stars are all 7th to 10th magnitude, and likely all the stars in the field except for the 3 brightest stars are true cluster members. In good skies, upward of 75 stars can be glimpsed. The cluster is flanked by gamma Cancrī at the top left, and delta Cancrī at the bottom left. The triangular enclosure of M44 is completed by the fainter star eta Cancrī.

**CANES VENATICI – M3 (NGC 5272)** – M3 is a globular star cluster that is very small at 2' in diameter but easy all the same. It is very bright, concentrated to the center, about 8th magnitude, round and blue. There is a 7th magnitude star just 1/2-degree SW that is light red. A 7.5 magnitude star 1-degree SE completes a long triangle. Scan over from beta Com to find the field.

**CANIS MAJOR – M41 (NGC 2287)** – M41 is a pleasing open cluster about 1/4 degree in diameter. Fifteen to eighteen stars can be distinguished in the 8th to 10th magnitude range, despite this cluster’s lowness to the south horizon. There is a fairly bright 7th magnitude star, 12 Canis Majoris, to the SE. Otherwise, this is a fairly sparse field.

**CASSIOPEIA – NGC 7789** – This is a fairly easy open cluster found about half way between 7 & 8 Cassiopeiae, but slightly closer to the red 7 Cas. It is a 1/4-degree homogeneous faint white fuzzball of about 8th magnitude, quite spherical. No stars can be resolved.



## The Chatfield Binocular Challenge – Part 2 *by Rick Huziak*

**T**his is Part II of a 4-part series. You may have noticed that this Challenge contains a large number of Messier objects. Indeed, you can earn 27 of your 110 Messiers by completing this binocular list. Depending on which binoculars you use, you may be able to do 70 or even all Messiers without ever using a telescope. This should be encouragement to members who have not yet purchased a scope. As you can tell by the descriptions, binoculars can see a lot of the sky, and they also help you learn the sky. Some astronomers consider their binoculars as their most important telescope, since they always get you reoriented in the sky when you can't figure out the star hop in your scope. Binoculars are simply the best instrument for certain categories of objects, such as bright comets, dark nebulae and wide-field Milky Way views.

**CASSIOPEIA – NGC 663** – This is a most obvious open star cluster and is the brightest star cluster found between eta and delta Cassiopeiae. The cluster is about 10' in diameter, and only about 5 stars in the 9th to 10th magnitude range can be resolved within the fuzz. North of the cluster, just against an 8th magnitude star is the barely distinguishable 5' fuzzball of NGC 654. Between NGC 663 and delta Cas is M52 (NGC 7654), 7' in diameter. M52 has a bright star overlying it.

**COMA BERENICES – MELOTTE 111 (Mel 111)** – Mel 111 is a coarse open star cluster of about 80 bluish-white stars from magnitude 5 to 10 as seen in binoculars. The cluster is so large, that it fills more than one binocular view. This is one of the closest star clusters, being closer than the Pleiades. It is roughly triangular in shape.

**CYGNUS – NGC 7000** – This is the famous North America Nebula (not American!). It is easily visible with the naked eye as a large, 3-degree patch of bright Milky Way to the NE of alpha Cygni, Deneb. Many people do not see it at first, not sure what to expect. Binoculars help the view and show more detail. This object is too large for a single binocular field, so starting at Deneb, scan E approximately 1 binocular field through black sky until the field turns milky. This is Mexico. To the right of the field is the ink-black Gulf of Mexico, and scanning off to the left, and the Baja side, a bright red star is just outside the nebula. Careful scanning all around will distinguish the east and west coastlines of North America, with the N coast of Canada being hardest to distinguish. Remember – scan back and forth to find where the dark sky between the stars turns from black to milky. The milky part is the nebula. The whole area is overlaid by hundreds of stars from magnitude 7 to 10. This is a beautiful binocular field.

**CYGNUS – M39 (NGC 7092)** – The M39 field is easy to find by scanning W of Deneb. It is an open cluster of about 20 binocular stars of 9th and 10th magnitude. The stars form a distinct triangular shape about 1/2 degree in diameter. In smaller binoculars, the stars may be indistinguishable. The surrounding field is beautiful, with mottled faint star clouds cut by dark dust lanes. A rough line of 4 or 5 stars of 7th and 8th magnitude run WNW away from M39 for 2-degrees.

**GEMINI – M35 (NGC 2168)** – This is a very bright, 7.5 magnitude open star cluster about 1/2-degree in diameter and slightly triangular. With averted vision, the whole cluster breaks up into tiny stars of magnitude 9 through 11 – at least 50 stars can be seen. 1 and 7 (eta) Geminorum are dominant on the S edge of the binocular field. Though tiny and dim, another open cluster, far more distant, NGC 2158, is just detectable to the SW of M35. It is about 5' in diameter, and 11th magnitude. The whole area is a beautiful Milky Way field full of dark dust lanes.

**HERCULES – M13 (NGC 6205)** – M13 appears as a fuzzy ball, approximately 5' in diameter and brighter to the center. It is round, 5th magnitude, and can be glimpsed naked eye. It is flanked by a shallow triangle with two 7th magnitude stars. There are several other 7th and 8th magnitude stars in the 5-degree field.

**HYDRA – M48 (NGC 2548)** – This is an easy open cluster, obvious, and about 15' to 20' in diameter. Its total magnitude is 7 and it contains about 15 stars around 9th magnitude. The cluster is distinctly oval, oriented SE to NW. This field is at the very edge of the Milky Way. Move the binoculars one field to the left, and the sky darkens considerably. Find M48 using the line through the 3 stars 1, c and 2 Hydrae.

**MONOCERES – M50 (NGC 2323)** – This open cluster shows as a faintish smudge about 8th magnitude 10' in diameter. Three or four stars are involved within. The field can be confirmed by the presence of a T-shape of 7th magnitude stars about 2-degrees wide, where M50 forms the left branch of the top of the T. This is a fine Milky Way field, crowded with faint stars everywhere. Across the left half of the field, there is a series of intertwining dark dust lanes running north and south, beginning 1-degree E of M50.

**MONOCERES – NGC 2264** – In contrast to M50, this is a rather unimpressive 1/2-degree open cluster in binoculars with maybe 20 stars barely distinguishable from a very rich Milky Way background. This object is also known as the Christmas Tree Cluster. Find this field by scanning S from xi Geminorum. The bright star 15 Monocerotis dominates the field by far, and with averted vision, the brightest part of the associated diffuse nebula can be brought out. A saving grace for this field is that it is a fine Milky Way field with bright star clouds and dark nebulae all over the place. Although this open star cluster is a "challenge", it is certainly not a good binocular object.

**ORION – M42 (NGC 1976)** – This famous diffuse nebula is a faint gray colour in binoculars. The nebula forms a rough ball of light about the size of the moon. Barely separated from M42, and difficult to distinguish at this power, is M43 (NGC 1982). M43 is a part of M42 separated by a dark lane of dust. One degree above M42 is the coarse open cluster NGC 1981 with a half dozen bright stars visible. The faint diffuse nebula, NGC 1977, can be distinguished around 42 & 45 Orionis. To the S about 1/2-degree from M42, is another faint nebula, NGC 1980, surrounding 44, iota Orionis. This is a very interesting 5-degree field!



## The Chatfield Binocular Challenge – Part 3 *by Rick Huziak*

This is Part III of a 4-part series. None of us spend enough time under the stars with our binoculars. I use my binoculars to practice star hops before I attempt them in the telescope spotter. In past times, I had a spotter that had the same view as my scope (upside down and backward). That meant that I would do a star hop with binocs, then have to mentally flip the star hop to do it again in the scope's spotter. Once I began to do the bulk of my observing in the city (variable stars), I found that I was using my binoculars all the time to find faint stars that the eye simply cannot see over the brightness of streetlights. I then realized that it made infinitely more sense to have my spotter the same view as my binoculars so that I didn't have to do the mental flip anymore during the sometimes complex star hops. Once you go erect, you never go back! Enjoy the following objects in the darkest skies you can find. A darker sky makes binocular fields spectacular.

**OPIUCHUS – M10 (NGC 6254)** – Both M10 and M12 fit in the same binocular field, being approximately 4-degrees apart. M12 is slightly more condensed to the center than M10. Both are approximately 8th magnitude and 3' in diameter, so they are not easy if the sky is not that good. Other than these two globular clusters, the field is rather unspectacular.

**OPIUCHUS – M12 (NGC 6218)** – see M10 above

**PEGASUS – M15 (NGC 7078)** – This globular star cluster is a very small fuzzy spot, only about 2' in diameter. Because of its small size, it is easy to mistake this as a star, so it must be searched for carefully. Once found, it can be seen to be a faint blue spot, 8th magnitude and brighter to the middle. There is a 7th magnitude star a few minutes E and a 9th magnitude star barely NE. This is a rather empty binocular field.

**PERSEUS – NGC 869/NGC 884** – NGC 884 is the E-most of these two famous Double Cluster members. In binoculars, this cluster contains about 10 stars. NGC 869 contains about 5 stars, but both clusters show a great deal of background fuzz. The brightest stars overlying the two clusters are light red in colour. These are the clusters' most evolved stars; red supergiants all a hundred times the size of the sun, and destined to become bright supernovae within the next few million years. All are small amplitude variable stars. Two parallel lines of brighter stars extend to the NW of NGC 864 for about 2-degrees, and end in a faint splotch of 30 or more stars of the 9th magnitude. This splotch is Trumpler 2 (Tr 2), a faint open cluster I once called "Huziak 2" when I discovered it in my early observing years. It wasn't plotted on my copy of Norton's Star Atlas. Tr 2 forms a distinct pattern that looks like a ">A". Straight E in the field, at the very edge, is a small 4' diameter fuzzball surrounded by a few faint stars. This is yet another open star cluster, NGC 957. The entire area is full of mottled dark lanes in this spectacular Milky Way field.

**PERSEUS – M34 (NGC 1034)** – M34 is an easy cluster found about 1/2 way between the famous variable star Algol and beta Andromedae. It has a distinct dual shape, with an inner core of 7 or 8 stars of 8th to 9th magnitude with a bit of haze. Surrounding this is a circular coarse grouping of 15 stars of 8th to 11th magnitude, about 1/2 degree in diameter. The dual structure is interesting, but the field is otherwise unimpressive. All stars are white.

**PISCIS – CIRCLET OF PISCES** – This asterism is not a true cluster, but the coincident circlet of stars forms the west-most fish of the Piscis pair. You will need a wide binocular field to see this 6-degree wide oval of stars, slightly flat N to S. The circle consists of 7 main stars, magnitude 4 to 6. The brightest star is 4th magnitude yellow gamma Psc at the leading (W) edge. Many other stars, theta and iota and others may be yellow as well. Kappa Psc is a wide double consisting of red and blue components. At the east edge is a very red variable star, TX Psc, whose shallow range can be followed in binoculars.

**PUPPIS – M47 (NGC 2422)** – M47 is a coarse open star cluster of about 15 stars distinguishable from magnitude 8 to 10. It is very easily visible to the naked eye, being about 8' or 1/4 the diameter of the moon. About 1-degree N of M47 is a homogeneous ball of M46 (NGC 2437). Within M46, no stars are visible.

**SAGITTARIUS – M22 (NGC 6656)** – M22 is a 7th magnitude bright hazy spot, approximately 15' in diameter and slightly brighter to the middle. This globular star cluster is round in shape. To the SW is a triangle of stars and equidistant to the NE is another bright star. A fainter and small ball of light can be seen to the SW in the field. This is another globular cluster – M28 (NGC 6626).

**SAGITTARIUS – M24 (IC 4715)** – M24 is also known as the Sagittarius Star Cloud. It is very nice in 8x50's – a glowing patch of light 2-degrees x 3-degrees oriented NE – SW. The patch is overlapped by an oval grouping of approximately 30 stars of magnitude 7 to 9. Within the edges of the binocular field are several other fuzzy objects of interest: M23 (NGC 6494), M25 (IC 4725), NGC 6603, M18 (NGC 6613), M17 (NGC 6618) and the "Y" pattern of 13, 15, 16 & 17 Sgr. Note that M24 is misidentified as NGC 6603 in the 1st edition of Sky Atlas 2000, but this is corrected in the new version.

**SCORPIUS – M4 (NGC 6121)** – This globular cluster is a round glow that forms a flattened triangle with alpha (Antares) and sigma Scorpii. It is about 1/2-degree (the size of the moon!), slightly brighter to the center. The rest of the field is fairly barren. Note the reddish colour of Antares, also known as the "Son of Mars".



## The Chatfield Binocular Challenge – Part 4 *by Rick Huziak*

This is Part IV of a 4-part series. This is the last installment in the Chatfield list. In modern days of larger telescopes and go-to electronic scopes, I often feel that “you might get to your destination, but along the way, you miss the trip”. Astronomy seems to be going higher tech all the time. And we can easily forget the beauty of a wide-field view. The next clear moonless night, find some of the Chatfield objects – they are all worth chasing down, because along the way, there are very many wonderful sights. Once you find an object, check a star atlas and see if you can figure out a star hop to the next object that will send you on a trip along the Milky Way. The Milky Way is full of excellent star clouds and dark dust lanes. Scanning the sky with binoculars is always rewarding. Good luck on this month’s Chatfield objects.

**SCORPIUS – M6 (NGC 6405)** – M6 and nearby NGC 6416 form a pair of adjoined open clusters that are informally known as the Butterfly Cluster. In binoculars, these form two fuzzy spots jointed together, but not much more detail is visible, likely due to the proximity to the south horizon as seen from Sleaford. Four degrees to the SE is M7 (NGC 6475). M7 is large, about 2-degrees in diameter with a bright core and surrounded with many very bright 6- and 7-magnitude stars. It seems to me that M7 would have been a better choice for a binocular challenge object. None of these objects are easy due to their far-southern location in the sky.

**SCUTUM – M11 (NGC 6705)** – This is a small but intense open star cluster – a round ball of light about 5’ in diameter. A 9th magnitude star is barely following the cluster, and no other stars can be resolved with binoculars. Note the spectacular field surrounding. The top half is dark, and the bottom half is bright with star clouds. Note the trapezoid of stars nearby with red R Scuti prominent. The entire variable range of R Scuti can easily be followed in binoculars with changes noted daily.

**SERPENS – M5 (NGC 5904)** – M5 is a fuzzy ball about 3’ in diameter and brighter to the center. It is sharper and more concentrated than M13. It is 6th magnitude. Slightly reddish 5 Serpentis is very near by.

**SERPENS – IC 4756** – Note that this object is incorrectly listed on the Challenge as NGC 4756. It is indeed an Index Catalog (IC) object. About 50 stars to 9th magnitude are visible, loosely scattered in an open star cluster. However, the cluster is bounded by four or five 7th magnitude stars. The entire cluster is about 2 degrees in diameter. The exact extent and form of the cluster is hard to distinguish from the already-rich Milky Way background, but it does form a distinct glow in the center of the field. At the leading edge of the field, a smaller but brighter open cluster in noticeable – NGC 6633. It is 7th magnitude and shows about 15 stars and haze in a distinctly bar-shaped pattern.

**TAURUS – M45** – The famous Pleiades is a wonderful binocular open star cluster with at least 60 cluster members

visible from 4th to 11th magnitude. The cluster fills 3-degrees of the binocular field and is mostly roundish. A curious curved line of 7 faint stars extends SE from eta Tauri (Alcyone). The 7th Pleiade, often commented on as “difficult to see”, has a good reason for this reputation. It is the irregular variable star, BU Tauri, and for the last few years, it has been pretty faint and around 6th magnitude, making the Pleiades look like a 6-sister team in poorer skies. All stars are white with a faint blue tinge, and the cluster contains virtually no colour.

**TAURUS – MELOTTE 25 (Mel 25)** – Taurus the Bull’s head is one of the closest star clusters to the earth. At one time, the sun was thought to have been a member of this cluster, but that is now believed not to be true. The 8-degree size of this cluster makes it too large for a single binocular field, so you have to scan around to see its great extent. The V-shape of the main bright stars is obvious naked eye, but is highlighted in binoculars by the wide double star of equal magnitudes, theta 1 & theta 2 Tauri. The stars in this cluster are basically white, except for Aldebaran, which contrasts strongly with an orange/red colour. There are 120 stars easily visible in the main V, but this extends to 150 or more when the area to the N around kappa 1, kappa2, 50, 51, 53 & 56 Tauri are included on the count. This is a wonderful cluster to cruise around in with binoculars.

**URSA MAJOR – M81 (NGC 3031 / M82 (NGC 3034)** – This is a very easy binocular field. The two galaxies are separated by about 1-degree. M81 is bright and oval, with a very bright nucleus. The galaxy spans a 5’ x 7’ area. M82 is a long and flat homogeneous bar with no internal details visible. It is about 1/2 the size of M81, at 2’ x 4’ in area.

**URSA MAJOR – Mizar/Alcor** – Mizar is a 3rd magnitude whitish-blue star. Alcor is 4th magnitude and pale blue, but bluer than Mizar. A faint star forms a shallow triangle between the two. There is also a faint triangle of stars 2 degrees below Mizar to the SW. Mizar itself is a close double star, but at 8x magnification, I cannot split it.

**VULPECULA – M27 (NGC 6853)** – M27 is a planetary nebula situated in a very fine Milky Way field. Its rectangular shape is easy to distinguish in binoculars. The nebula appears bluish. The nebula is at the base of an M-shaped asterism of 7th magnitude stars where the 2 top peaks of the M are wide binocular doubles. To find this M, scan to the NE from the arrow point of Sagitta.

**VULPECULA – COLLINDER 399 (Cr 399)** – This is the “Coathanger”. It is an asterism, not an open star cluster. Asterisms are chance alignments of stars, and very few stars in the Coathanger are physically associated. Six or seven bright stars form a dead-straight bar, and 4 stars for the hook on this upside-down version of a hanger, or backward J. The Coathanger spans about 2 degrees in length. The surrounding field is slightly mottled.