

Deep South Texas Stargaze 2006 - Binocular/Novice Observing List

This list is designed to showcase some of the best binocular objects in the Winter sky. They are all be relatively easy to find and will be visible early to mid evening at DSTS.. Please refer to the attached finder map for help in locating them. To complete this list you must observe at least 14 of the 15 objects. They are ordered by which set first, so start at the top of the list. All observations must be made at the 2006 DSTS star party.

Object	Notes	Date/Time Observed
M31 - Andromeda Galaxy <i>Andromeda</i>	<p>At an estimated distance of 2.5 million light-years, M31 is the furthest object visible with the unaided eye. In binoculars, the elliptical core is readily apparent, however with good skies and careful study, the diffuse glow of the spiral arms can be seen to span around 4°. The true diameter of M31 is around 150,000 light-years and it contains an estimated 200 billion stars.</p>	
Hyades Cluster <i>Taurus</i>	<p>The Hyades form the face of the Bull in Taurus. It is the second nearest open cluster known (after the Ursa Major Moving Cluster) with a distance of 150 light-years and an estimated age of 750 million years. The red-giant star Aldebaran within the cluster is 68 light-years distant and is not a true cluster member. The Hyades spans some 3.5° in the sky and is best appreciated in binoculars.</p>	
Alpha Persei Association <i>Perseus</i>	<p>Too large for most telescopes, this stellar cluster is best appreciated in low-power binoculars. At 750 light-years away, it is the eighth nearest cluster and spans approximately 4° in the sky. The cluster is relatively young at only 14 million years old and contains around 100 stellar members. Be sure to note the color contrasts of some of the brighter stars in this grouping.</p>	
NGC 869 & 884 - Double Cluster <i>Perseus</i>	<p>Even though these two fabulous clusters are less than 1° apart and fit in the same binocular field of view, it is unclear whether they are related. NGC 869 (the lower one in binoculars) is 7000 light-years distant while NGC 884 is 8100 light-years away. NGC 869 also appears to be slightly older. Nevertheless, these differences are less than the normal measurement errors and may not be significant.</p> <p>They are both massive clusters with 869 containing 3900 solar masses and 884 containing 3300 solar masses. Each spans about 35' in the sky giving true diameters of around 70 light-years. They are young clusters with estimated ages of 5.6 million years for NGC 869 and 3.2 million years for NGC 884.</p> <p>Whereas most of the winter open clusters are in our Orion spiral arm of the Galaxy, at 7,000-8,000 light-years, the Double Cluster lies further away in the Perseus spiral arm.</p>	
Gamma Leporis - Double Star <i>Lepus</i>	<p>This easy binocular double star lies 29 light-years away and has components 95'' apart with magnitudes 3.6 and 6.2. The true separation between the two stars is 1000 Earth-Sun distances or about 5.6 light-days. At this separation, the stars must take thousands of years to orbit each other.</p>	

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M42 - Orion Nebula <i>Orion</i>	The Orion Nebula is one of our best examples of a stellar nursery. Observations have shown it contains approximately 700 stars in various stages of formation. The Trapezium is a group of 4 bright-young stars near the center of the nebula which are believed to be illuminating the gas. M42 is located around 1,600 light-years away and has a true size of around 33 light-years.	
Betelgeuse <i>Orion</i>	This beautiful orange-red star is quite bright for its distance of 520 light-years. The reason is its great size. Betelgeuse is a red super-giant, perhaps 1000 times the diameter of the Sun. If it were placed where the Sun is, the star would extend out to the orbit of Jupiter.	
Kemble's Cascade & NGC 1502 <i>Camelopardalis</i>	Kemble's Cascade is a fine line of unrelated 5th to 10th magnitude stars that spans over 2.5° of sky. Near the southeastern end you might be able to see a brighter star with a smudge around it. That smudge is the open cluster NGC 1502 lying 2,600 light-years away. To find Kemble's Cascade, draw an imaginary line from the two stars at the top of the W of Cassiopeia, and extend the line to the left the same distance using your binoculars.	
M35 - Open Cluster <i>Gemini</i>	This open cluster of nearly 120 stars is around 2,200 light-years distant. Because many of its stars are 8th and 9th magnitude, it resolves quite well in binoculars. The cluster spans 30' in the sky, about the same size as the full moon. This would imply a true size of 24 light-years. The cluster is believed to be 70 million years old, making it an "adolescent" as far as open clusters go.	
M41 - Little Beehive Cluster <i>Canis Major</i>	This fine open cluster contains around 50 stars and spans some 30' in the sky. It lies 2500 light-years away within our own spiral arm of the Galaxy and has a true diameter of at least 20 light-years. M41's approximate age is 100 million years.	
NGC 2244 - Cluster with Rosette Nebula <i>Monoceros</i>	This coarse open cluster is almost lost in the background clutter of the Milky Way. You can recognize it as a roughly rectangular shape marked by brighter stars. With a dark sky and binoculars you should be able to just see the tenuous Rosette Nebula that surrounds the cluster like a wreath. It is believed that the stars formed only 500,000 years ago and their "Stellar wind" has opened the hole in the nebula. The cluster-nebula complex is 4,900 light-years distant. Its size of 115 light-years makes it one of the largest emission nebulae known in our Galaxy.	

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M44 - Beehive <i>Cancer</i>	<p>If you can find Saturn, then M44 will be in the same field of view as a large “swarm” of dim stars. Estimated to lie 525 light-years away, M44 is the fifth nearest open cluster to us. It is an old cluster that is believed to have formed around 700 million years ago. Its true diameter is about 13 light-years.</p>	
M81/M82 <i>Ursa Major</i>	<p>This pair of galaxies is at the heart of the Ursa Major Galaxy Group with an estimated distance of over 13 million light-years, the most distant objects on this list. While binoculars are not the best instruments for most galaxies, M81 and M82 should stand out well under dark skies. M81 will be a small oval elongated north-south, while M82 will appear as a smaller spindle of light oriented east-west.</p>	
Coma Star Cluster (M111) <i>Coma Bernices</i>	<p>At 250 light-years away, this cluster is the third nearest to us after the Ursa Major Moving Cluster and the Hyades. Like the Hyades, this cluster is best appreciated in binoculars. At its relatively close distance, its diameter of 22 light-years spans almost 5° in the sky. The cluster has a mass of only 100 Suns and at that density it is in danger of being easily torn apart. It is about 500 million years old and has probably already lost many of its members.</p> <p>Most open clusters lie in the band of the Milky Way formed by the Galaxy’s disc and spiral arms. The Coma Cluster is unusual in that it lies in the direction of the north galactic pole, well away from the Milky Way. However, despite its apparent direction, its close distance of 250 light-years means it still resides well within the galactic disc.</p>	
M3- Globular Cluster <i>Canes Venatici</i>	<p>There are not many globular clusters in the Winter sky since you are looking away from the galactic center where most of these fuzzy star-balls reside. You’ll need to wait until 10:30 - 11 PM for this object to rise above the eastern horizon.</p> <p>M3 is 38,000 light-years away making it the furthest “Milky Way” object on his list. It’s true diameter is around 220 light-years with perhaps 300,000 stars packed into that volume.</p> <p>It will appear in binoculars as a small fuzzy star several arc-minutes across.</p>	

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Note: Data for this observing list was compiled from *Binocular Astronomy* by Crossen and Tirion, the SEDS website at <http://www.seds.org/messier/>, *Star Clusters* by Archinal and Hynes and *The Observer's Sky Atlas* by Karkoschka.