

The Eldorado Star Party

2025 Telescope Observing Club

by Bill Flanagan
Houston Astronomical Society

Purpose and Rules

Welcome to the Annual ESP Telescope Club! The main purpose of this club is to give you an opportunity to observe some of the showpiece objects of the fall season under the pristine skies of Southwest Texas. We have also included a few items on the observing lists that may challenge you to observe some fainter and more obscure objects that present themselves at their very best under the dark skies of the Eldorado Star Party.

The rules are simple; just observe the required number of objects on the observing list while you are at the Eldorado Star Party to receive a club badge.

Love Story

The telescope program for ESP 2025 is “**Love Story**.” The autumn night skies above the X Bar ranch present us with a love story. The story starts with our hero, Perseus, who is flying back home after decapitating Medusa and finds Andromeda, the beautiful daughter of Cassiopeia and Cepheus, chained to a rock on the coast of the sea in Jaffa. Andromeda was chained to the rock by her parents as a sacrifice to the sea monster Cetus. Cetus was sent by Poseidon, god of the sea, as punishment for Cassiopeia’s arrogance after she bragged that she and Andromeda were more beautiful than the sea nymphs. Perseus arrives just in time to slay Cetus before the sea monster devours Andromeda. Perseus releases Andromeda from her chains and brings her back to Greece where they marry, Andromeda reigns as queen and they live happily ever after.

The observing list for “**Love Story**” contains 26 objects located in the constellations of Andromeda, Cassiopeia, Cepheus, Cetus or Perseus. Although there are a few challenging objects on the list, most should be visible in moderate sized telescopes. While you are encouraged to observe all the objects, you need to observe only **23 of the 26** objects on the list to qualify for the ESP Telescope Observing Club badge.

Previous ESP Observing Clubs

Please note that all previous observing programs offered at ESP from 2004 onward are still available. Club badges from these earlier programs (*with the exception of 2009 - Texas Hash*) are also available and will be awarded to anyone completing them at ESP. Check the Eldorado Star Party website at www.eldoradostarparty.org to select one (or more!) of these observing lists.

Club Badges

Any size telescope or binocular can be used to complete the observing programs. Again, all observations must be made at the Eldorado Star Party in order to qualify for an ESP observing badge. To receive your badge, please turn in your observations to Bill Flanagan any time during ESP. I will try to be available on the observing fields as well as in the Lodge prior to the meals and talks. If you finish the list on the last night of ESP, or I am not available to give you your badge, just mail a copy of your observations to me at 815 Azalea, Houston, TX 77018, and I will send you your badge.

Good Luck and Good Observing!

Love Story

Primary ID	Alternate ID	Type	Con	RA 2000	Dec 2000	Mag	Size	Distance	Date	Time
NGC 6939	Collinder 423	Open	Cep	20h31m30s	+60°39'42"	10.1	10.0'	3,860 ly		
NGC 7023	LBN487	Neb	Cep	21h01m36s	+68°09'52"	6.8	15'x10'	1,300 ly		
NGC 7129	Small Cluster Nebula	Neb	Cep	21h43m00s	+66°07'00"	11.5	2.7'	3,300 ly		
NGC 7510	Collinder 454	Open	Cep	23h11m03s	+60°34'12"	9.3	6.0'	11,400 ly		
Bubble Nebula	NGC 7635	Neb	Cas	23h20m43s	+61°12'31"	11.0	16.0'x 9.0'	7,100 ly		
NGC 7640	MCG 7-48-2	Gal	And	23h22m07s	+40°50'44"	11.6	8.7'x 1.7'	30 Mly		
NGC 7789	Caroline's Rose	Open	Cas	23h57m24s	+56°42'30"	7.5	25.0'	7,600 ly		
VX And	HD 1546	Var	And	00h19m54s	+44°42'34"	8.6		1,200 ly		
NGC 133	Collinder 3	Open	Cas	00h31m19s	+63°21'00"	9.4	7.0'	2,100 ly		
M 110	NGC 205	Gal	And	00h40m22s	+41°41'09"	8.9	17.8'x 9.8'	2.7 Mly		
M 32	NGC 221	Gal	And	00h42m42s	+40°51'58"	8.9	8.5'x 5.9'	2.5 Mly		
PacMan Nebula	NGC 281	Neb	Cas	00h53m00s	+56°37'00"	7.4	30.0'	9,500 ly		
Mirach's Ghost	NGC 404	Gal	And	01h09m27s	+35°43'05"	11.2	4.7'	11.0 Mly		
Hickson 10		GalCl	And	01h26m07s	+34°41'27"	10.9	10.9'	210 Mly		
NGC 584	MCG -1-4-60	Gal	Cet	01h31m21s	-06°52'06"	11.3	3.7'x 2.4'	62 Mly		
NGC 654	Collinder 18	Open	Cas	01h44m00s	+61°53'06"	8.2	5.0'	7,800 ly		
IC 1747	PN G130.2+01.3	PNe	Cas	01h57m36s	+63°19'19"	12.0	13"	8,000 ly		
NGC 779	MCG -1-6-16	Gal	Cet	01h59m42s	-05°57'52"	11.9	1.5'x 0.6'	59 Mly		
NGC 908	MCG -4-6-35	Gal	Cet	02h23m05s	-21°14'02"	10.8	6.2'x 2.8'	62 Mly		
HR 716	HD 15253	Doub	Per	02h29m25s	+55°32'10"	6.5		650 ly		
IC 1805	Collinder 26	Open	Cas	02h32m42s	+61°27'00"	4.8	20.0'	7,500 ly		
NGC 1052	MCG -1-7-34	Gal	Cet	02h41m05s	-08°15'18"	11.4	2.9'x 2.0'	62 Mly		
M 34	NGC 1039	Open	Per	02h42m05s	+42°45'42"	5.8	35.0'	1,500 ly		
Miram	Eta Per	DVar	Per	02h50m42s	+55°53'43"	3.8		1,300 ly		
NGC 1245	Collinder 38	Open	Per	03h14m42s	+47°14'12"	7.7	40.0'	9,800 ly		
NGC 1528	Collinder 47	Open	Per	04h15m23s	+51°12'54"	6.4	16.0'	3,100 ly		

Love Story – Observing List Notes

NGC 6939 The first object on the ESP 2025 “*Love Story*” list is an open cluster in Cepheus about 3,860 light years distant. It is a relatively old cluster with an estimated age of 1.3 billion years. NGC 6939 has a mostly triangular shape but is framed in stars that also give it a square appearance. It is a moderately concentrated cluster of about 100 stars ranging between magnitudes 11 and 14. Visually it appears to be about 8' in size. There is a linear extension running off the top of the triangle to the southeast that gives it the appearance of a railroad handcar.

NGC 7023 Also known as the Iris Nebula, NGC 7023 is located in the constellation Cepheus about 1,300 light years from us. This reflection nebula shines at magnitude 6.8 and is illuminated by a single magnitude 7 star (HD 200775) centered in the field and located in front of the nebula. The nebula appears to be about 15' x 10' in size and oriented north-south. The region around the NGC 7023 appears to be obscured by something, as it is devoid of dimmer stars in the area surrounding the object.

NGC 7129 The “Small Cluster Nebula” is located about 3,300 light years from us in the constellation Cepheus. It contains a young open star cluster, about 1 million years old, that illuminates this reflection nebula. The cluster shows visually as a loose collection of about 12 magnitude 8 to 11 stars involved with the nebulosity. The visual portion of the nebula is about 3' in size and has a “rosebud” shape to it with the base of the rosebud on the northeast side.

NGC 7510 An open cluster located in the constellation Cepheus near its border with Cassiopeia. It is about 11,400 light years from Earth with an estimated age of 10 million years. Visually it stands out from the background stars making relatively easy to find. It is about 8' in size and has a triangular shape, with the point of the triangle or arrow pointing to the southwest. In a 14” telescope, about two dozen stars stand out in NGC 7510 but there are probably more stars involved with the cluster that appear only as dim background glow to the cluster.

NGC 7635 The “Bubble Nebula” is an emission nebula located in the constellation Cassiopeia about 7,100 light years from Earth. The bright stars involved make it relatively easy to find. You should be able to detect a dim glow around the magnitude 8.7 star in the middle of the nebula. Visually, the glow from the nebula is about 3' x 2' and runs south to north, ending near a small group of 3 fairly bright stars. There is also a bright, magnitude 7 star about 6' to the southwest of the nebula that also seems to have some faint nebulosity around it. You may be able to detect the horn-like structure of the brighter portion of the bubble in the nebula.

NGC 7640 The barred spiral galaxy, NGC 7640, is located in the constellation Andromeda about 30 million light years away. Its edge-on orientation makes it appear as a thin wisp of light about 7' x 1.5' in size, oriented mostly north to south. There are three fairly bright magnitude 11 stars that frame the central part of the galaxy. Averted vision appears to show some surface mottling. It does not show much core concentration, although a magnitude 13 foreground star located near the core sometimes gives the illusion of a stellar core, but it is off-center.

Love Story – Observing List Notes

NGC 7789 Situated about 7,600 light years from us in the constellation Cassiopeia is the open cluster NGC 7789. It was discovered by Caroline Herschel in 1783 and is often referred to as “Caroline’s Rose” because the loops of stars and dark lanes in the cluster give it the visual appearance of a blooming rose. With an estimated age of around 1.7 billion years, NGC 7789 is an old open cluster. In the telescope, it appears as a nice, big, rich open cluster with more the 200 stars of magnitude 11 and dimmer.

VX And Located in the constellation Andromeda about 1,200 light years from us, the carbon star VX Andromedae glows at magnitude 7.6 with a nice orange to red color. It is somewhat isolated by itself, surrounded by a scattering of magnitude 11 stars, the closest being about 2' away. It may be a little hard to find but its color will make it stand out in the starfield.

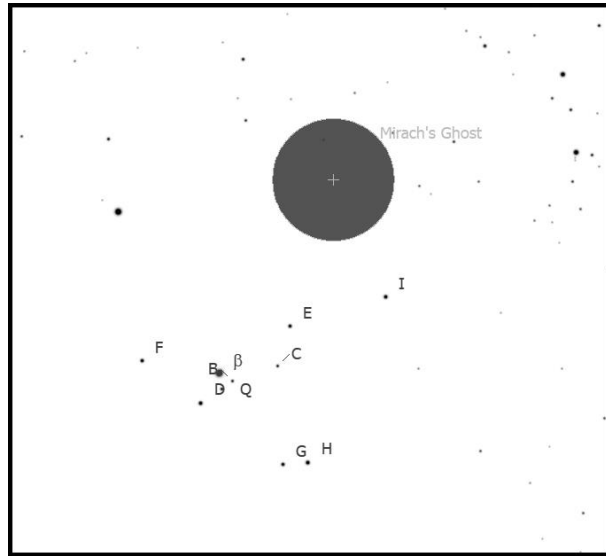
NGC 133 Located in the constellation Cassiopeia about 2,100 light years from us, NGC 133 is a relatively young cluster with an estimated age of 10 million years. Two other open clusters, NGC 146 and King 14, are close enough to NGC 133 to be placed in the same field of view of the telescope. The three clusters are arranged in an equilateral triangle in the sky. NGC 133 is the brightest but also seems to be the sparsest. About half dozen stars magnitude 9 to 10 are arranged in an arrow shaped configuration on the northwest corner of the triangle. NGC 146 is on the east side and is composed of about 15 magnitude 11 to 12 stars. It's looser than NGC 133. King 14 is on the south point of the triangle and is the loosest of the three clusters.

M 110 (NGC 205) Located in the constellation Andromeda at a distance of 2.7 million light years, the dwarf elliptical galaxy, M 110, is a satellite galaxy of the Andromeda Galaxy, M 31. Through the eyepiece, M 110 shows as a fairly large oval patch of light, about 10' x 4' in size, oriented in a NNW-SSE direction. Its core is prominent and concentrated but not stellar in appearance. It is located adjacent to M 31, about 37' northwest of the core of M 31.

M 32 (NGC 221) Messier 32 is another dwarf elliptical galaxy that is a satellite galaxy of M 31, the Andromeda Galaxy. It is located at a distance of about 2.5 million light years from Earth. It is a relatively rare, compact elliptical galaxy, and visually appears as a small round patch of light about 6' in diameter. When compared to M 110, it has a more concentrated core that appears stellar at times. It is about 23' due south of the core of M 31 just on the edge of the halo of M 31.

PacMan Nebula (NGC 281) NGC 281 is an emission nebula with an open cluster (IC 1590) embedded in it. It is located in the constellation Cassiopeia about 9,500 light years from Earth. The stars in IC 1590 provide most of the radiation that illuminates the nebula. The nebula is fairly large, approximately 30' in size, and IC 1590 shows as a loose collection of about a dozen stars around 4' in size and centered on a bright magnitude 7.4 near the center of the nebula. A UHC filter should help bring out the nebulosity. If the transparency is good, you should be able to detect some mottling of the surface brightness and the notch (dark area) in the southwest corner of the nebula that is the mouth of the PacMan.

Mirach's Ghost (NGC 404) Located in the constellation Andromeda, Mirach's Ghost (NGC 404) is an isolated dwarf lenticular galaxy positioned just 7' NNW of the 2nd magnitude star, Mirach. The galaxy is about 11 million light years distant compared to Mirach which is about 197 light years from Earth. Although close to the bright star Mirach, NGC 404 is easy to spot as a mostly round glow about 2' in dia. The core of NGC 404 appears to be somewhat concentrated but not stellar. The star Mirach is a multiple star with 9 companions. The primary star is magnitude 2 and seems to have a yellowish tint to it. The companions to Mirach vary from magnitude 11.4 to 14.4. Use the chart to see how many of the components of Mirach you can find. Some may be difficult to see in the glare of the bright primary but hopefully the clear dark skies of the Eldorado Star Party will help you hunt down the dim companions.



Hickson 10 A compact group of galaxies located in the constellation Andromeda. The group consists of four galaxies at an average distance of around 210 million light years from us. All four galaxies appear to be gravitationally bound and interacting with each other. All four galaxies should be visible in a moderate-sized telescope under the clear dark skies of the Eldorado Star Party. The two main ones are easy. NGC 529 is a lenticular galaxy on the west and is visible as a round patch of light about 1.5' in diameter with a somewhat concentrated core that is almost stellar. To the east is the barred spiral galaxy, NGC 536. It is larger than NGC 529, about 2' x 1' oriented EW. It has a mottled surface and is brighter toward the core which goes stellar with averted vision. Another smaller barred spiral, NGC 531 is about 3' north of NGC 536, it is harder to spot but should be visible with averted vision. NGC 542 is a small spiral galaxy and is the hardest of the four to see. It is 3' to the SE of NGC 536 but with some effort, it should show with averted vision.

NGC 584 NGC 584 is an elliptical galaxy in the constellation Cetus about 62 million light years from Earth. In the telescope, it shows as a reasonably bright galaxy about 3' x 1.5', oriented in NE-SW direction. It shows some core concentration but not stellar. The core also looks elongated along the major axis of the galaxy. A companion galaxy, NGC 586, is located about 4' southeast of NGC 584. NGC 586 is classified as a spiral galaxy, type SA(s)a. It is dimmer and smaller than NGC 584 and oriented north to south, but it shows easily with averted vision in a 14" telescope.

Love Story – Observing List Notes

NGC 654 Located in the constellation Cassiopeia, the open cluster NGC 654 is about 7,800 light years from us. It is a relatively young cluster with an age of about 15 million years. The cluster easily stands out in the field of view with about 50 magnitude 9 to magnitude 14 stars that are arranged in a compact triangle about 5' in size. A bright magnitude 7.5, yellowish star is on the southeast tip of the triangle. Three magnitude 9-11 stars are arcing off to the southwest from the base of the triangle, giving the triangle a tail.

IC 1747 A small planetary nebula located in the constellation Cassiopeia about 8,000 light years from Earth. In the telescope it will show as a small fuzzy ball about 10" in diameter. It is centered in a curving arc of stars, almost like a jewel on a necklace, and is a reasonably easy find in a 14" telescope at 180x. If the seeing is steady, try using high power, above 350x, to see if you can detect the tiny hole in the center of this ring nebula.

NGC 779 Located in the constellation Cetus about 59 million light years distant, is the edge-on spiral galaxy NGC 779. Through the eyepiece it shows as a fairly bright elongated streak of light about 4' x 1' oriented NNW-SSE. There is some core concentration and with averted vision the core sometimes appears stellar. The galaxy is nicely placed inside an elongated triangle of magnitude 12 stars that are pointing south.

NGC 908 A spiral galaxy in Cetus about 62 million light years distant. NGC 908 is fairly bright and easily visible in most amateur telescopes. It has an oblong shape of about 5' x 2.5' and is oriented mostly east to west. In a 14' telescope, the surface appears mottled, and averted vision sometimes shows the core almost as a point of light or stellar. There are numerous stars in the field that make for a nice interesting and pleasing view through the eyepiece.

HR 716 (HD 15253) HR 716 is a close binary star in the constellation Perseus located about 650 light years from us. The primary star shines at magnitude 6.5 and the secondary at magnitude 8.5. The dimmer companion is about 3" SSE of the primary.

IC 1805 An open cluster with located in Cassiopeia about 7,500 light years from us. The radiation from this cluster is ionizing the surrounding gas causing it to glow and form the Heart Nebula (also known as the Running Dog Nebula). The cluster is about 20' in size with about 30-40 stars of magnitude 8-12. The stars in the cluster seem to form an outline of a crab with the pinchers arcing out and towards the west. With a UHC filter, the nebula is visible and brightest near the body of the crab. The whole area glows in a dim light with a number of dark lanes running through it.

NGC 1052 An elliptical galaxy about 62 million light years from Earth located in the constellation Cetus. NGC 1052 is relatively bright at magnitude 10.5 and has a round shape about 2' in diameter. If you look 15' to the southwest of NGC 1052 you should see a broad dim round smudge about 3' in diameter. This is the face-on spiral galaxy NGC 1042. Scan about 10' to the northwest of NGC 1052 and with averted vision you may be able to detect the magnitude 15 lenticular galaxy NGC 1047.

Love Story – Observing List Notes

M 34 Located in the constellation Perseus at distance of 1,500 light years is the open cluster M 34. The estimated age of M 34 is around 225 million years, making it an intermediate-aged open cluster. It is a relatively loose cluster with about 50 bright stars ranging in magnitude 8 to 12 across a 35' patch of the sky. Two bright stars form the eyes of a somewhat rotund guy doing a happy dance! He has his arms outstretched and legs bent.

Miram (Eta Per) A beautiful multiple star in the constellation Perseus about 1,300 light years from us. The primary shines bright at magnitude 3.8 with a golden yellow color. Companion B is dimmer at magnitude 8 and appears blueish white. It is located 28.5' to the northwest of the primary. Located 66.3" to the west of the primary is another companion. It is dimmer than B, glowing white at magnitude 10. At 185x this companion star appears elongated. Increasing the power to 300x will split it into two stars, showing both the C and D companions oriented east to west and separated by 5.2'.

NGC 1245 An open cluster in the constellation Perseus about 9,800 light years distant. NGC 1245 is an old open cluster with an estimated age 1 billion years. In the telescope it is composed of hundreds of stars of magnitude 11 and dimmer. Two bright stars of magnitude 8 and 9 are on the southeast side of the cluster but are probably foreground stars. NGC 1245 has a somewhat triangular shape with the point of the triangle pointing northeast.

NGC 1528 Located in the constellation Perseus, NGC 1528 is an open cluster that is about 3,100 light years from Earth. The estimated age of NGC 1528 is 110 million years, making it a young to intermediate age cluster. In the telescope, the cluster appears as a collection of about 50 relatively bright, magnitude 10 to 12 stars occupying and about 25' of the sky. The stars appear to be arranged in four main streams. NGC 1528 resembles a robot or muscle man with the curved stream of stars on the south side looking like he is raising his arm and waving back at us.