

The Eldorado Star Party

2026 Telescope Observing Club

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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 list 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.

Eldorado Round Up

Howdy all you night sky wranglers! It's time for the "**Eldorado Round Up**", the Telescope Observing Club Program for ESP 2026. The program is a list of 29 celestial objects scattered across the beautiful fall night sky of the X Bar Ranch. So saddle up and see how many of these celestial creatures you can round up and wrangle to your observing logbook. You may find a few of the objects elusive, but with some patience they will eventually reveal themselves and you will find yourself rewarded with a sense of mastery for rounding them up. Be sure to refer to the observing list notes below for information on each object along with some descriptions that may help you locate them.

You only need to observe **25 of the 29** objects on the list to qualify for the ESP Telescope Observing Club badge. But do try and round up as many of the objects on the list as you can.

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!

Eldorado Round Up

Primary ID	Alternate ID	Type	Con	RA 2000	Dec 2000	Mag	Size	Distance	Date	Time
M 13	Keystone Cluster	Glob	Her	16h41m41s	+36°27'36"	5.8	20.0'	24,100 ly		
NGC 6207	MCG 6-37-7	Gal	Her	16h43m03s	+36°49'57"	11.9	2.9' x 1.3'	34 Mly		
NGC 6503	MCG 12-17-9	Gal	Dra	17h49m26s	+70°08'40"	10.8	6.5' x 2.1'	21 Mly		
Webb's Wreath		Ast	Her	18h02m00s	+26°18'00"	7.0	11' x 7'			
M 57	Ring Nebula	PNeb	Lyr	18h53m35s	+33°01'45"	9.4	1.4'	2,600 ly		
NGC 6717	Palomar 9	Glob	Sgr	18h55m06s	-22°42'06"	8.4	5.4'	23,800 ly		
NGC 6742	Abell 50	PNeb	Dra	18h59m20s	+48°27'55"	13.4	31"	16,700 ly		
NGC 6751	PN G029.2-05.9	PNeb	Aql	19h05m55s	-05°59'33"	12.0	20"	6,500 ly		
UX Draconis	HD 183556	Var	Dra	19h21m35s	+76°33'35"	6.5		1,600 ly		
NGC 6802	Collinder 400	Open	Vul	19h30m35s	+20°15'42"	11.7	5.0'	3,700 ly		
M 27	Dumbbell	PNeb	Vul	19h59m36s	+22°43'16"	7.3	8.0'	1,360 ly		
Webb 9	HD 189864	Doub	Cyg	20h00m44s	+36°35'23"	6.7		980 ly		
Poskus 1	The Flyswatter	Ast	Del	20h46m00s	+16°20'00"	10.0	7' x 2'			
Gamma Delphini	12 Del	Bin	Del	20h46m38s	+16°07'21"	5.2		115 ly		
B 353		Dark	Cyg	20h57m24s	+45°28'00"	6.0	9.0'	2,000 ly		
Pismis-Moreno 1		Open	Cep	22h18m48s	+63°16'00"	7.5	6.0'	3,000 ly		
NGC 7332	MCG 4-53-8	Gal	Peg	22h37m24s	+23°47'53"	12.0	3.2' x 0.7'	67 Mly		
NGC 7339	MCG 4-53-9	Gal	Peg	22h37m47s	+23°47'11"	13.1	2.8' x 0.7'	67 Mly		
NGC 7619	MCG 1-59-52	Gal	Peg	23h20m14s	+08°12'22"	12.1	2.5' x 2.0'	170 Mly		
Little Ladle		Ast	Psc	23h40m42s	+07°57'00"	8.0	15.0'			
NGC 1	MCG 4-1-25	Gal	Peg	00h07m15s	+27°42'29"	13.7	1.5' x 1.0'	185 Mly		
NGC 2	MCG 4-1-26	Gal	Peg	00h07m17s	+27°40'42"	14.9	57"x 31"	305 Mly		
Arp 227	NGC 474 & 470	Gal	Psc	01h20m06s	+03°24'55"	12.4	3.0'x 2.4'	100 Mly		
M 103	NGC 581	Open	Cas	01h33m23s	+60°39'00"	6.9	5.0'	9,400 ly		
NGC 672	MCG 4-5-11	Gal	Tri	01h47m54s	+27°25'59"	11.4	6.2' x 2.3'	23 Mly		
NGC 772	Arp 78	Gal	Ari	01h59m20s	+19°00'28"	10.6	5.9' x 3.2'	106 Mly		
Kaffaljidhma	Gamma Ceti	Doub	Cet	02h43m17s	+03°14'05"	3.5		80 ly		
NGC 1400	MCG -3-10-22	Gal	Eri	03h39m30s	-18°41'17"	12.0	2.6' x 2.2'	82 Mly		
M 38	NGC 1912	Open	Aur	05h28m40s	+35°50'54"	6.8	20.0'	3,500 ly		

Eldorado Round Up – Observing List Notes

M 13 The Great Hercules Globular Cluster is located about 24,100 light years from us, shining at an apparent magnitude of 5.8 in Hercules. In moderate sized telescopes of 6" or larger, the view through the eyepiece will show countless resolved stars with radiating tentacles. If the seeing is good, try using a high-power eyepiece so that the stars of the cluster fill the field of view. Look off to the southeast side of the core of the cluster and see if you can detect three faint dark lanes radiating from a common point, 120° apart, in a pattern suggestive of a propeller. Averted vision may help coax the low contrast propeller into view. The propeller was first mentioned and drawn in the mid-19th century by Bindon Stoney, an assistant to William Parsons, Third Earl of Rosse, using Lord Rosse's 72-inch Leviathan reflector at Birr Castle in Ireland. It was later popularized by Walter Scott Houston in his *Deep-Sky Wonders* column of the July 1953 issue of *Sky & Telescope*.

NGC 6207 While you are in the neighborhood of M 13, scan about 27' to the northeast of M 13, and you should be able to detect NGC 6207. NGC 6207 is spiral galaxy located about 34 million light years from us. Shining at magnitude 12, it is relatively small and elongated, about 3' x 1.5' in size and oriented in the NNE-SSW direction.

NGC 6503 A dwarf spiral galaxy in Draco about 21 million light years away. It's located just west of an 8th magnitude star. In a 14" telescope the galaxy appears fairly bright, about 3' x 1' in size, elongated in the NW-SE direction. It has a smooth surface brightness and no real core concentration. The ends of the galaxy have a somewhat feathered appearance.

Webb's Wreath Located in the constellation Hercules, Webb's Wreath is an interesting asterism of about 14 stars arranged in an oval ring about 11' x 7' in size, elongated NNE-SSW. The stars range in brightness from magnitude 10 to 13. Five of the brighter stars on the NNE side form a half-circle arc about 5' in diameter. At the south end of this arc is the golden star, HD 164922, which shines brightly at magnitude 7. This asterism was first mentioned in Thomas Webb's 1881 edition of the *Celestial Objects for Common Telescopes*. Webb describes it as a "Wreath of stars 11th magnitude stars attached to an 8.5 magnitude star". Since Webb does not mention how many stars are in the asterism, he may have been describing just the obvious five brighter stars on the NNE side along with the "attached" bright magnitude 7 star and not the whole elongated oval asterism. See what you think.

M 57 The famous Ring Nebula in Lyra, located about midway between Gamma and Beta Lyrae. M 57 is about 2,600 light years from Earth and is the glowing ionized gas expelled from a star during the last stages of its life. That star is now a white dwarf located at the center of the ring, shining at magnitude 16. In amateur telescopes, the ring nebula appears as a small smoke ring about 7' in diameter. The nebula has a faint blueish, green color to it and is not completely circular but has feathery extensions on either side. If conditions are right, you might be able to glimpse the central star. Observing the central star requires a night with good seeing, high power and a telescope with an aperture of 12" or greater.

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NGC 6717 Globular cluster NGC 6717, also known as Palomar 9, is in the constellation Sagittarius just 2' south of a bright 6th magnitude star. It is located 23,800 light years from us and shines at an apparent magnitude of 8.4. It appears to have a somewhat irregular round shape about 2'- 3' in diameter. It is bright and easy to see, but in a 14" telescope it almost looks like a small open cluster with nebulosity. The nebulosity most likely being the unresolved stars of the globular.

NGC 6742 Also known as Abell 50, NGC 6742 is a distant planetary nebula in the constellation Draco located about 16,700 light years from Earth. In the telescope it shows as a dim round glow about 0.5' in diameter with perhaps a slight blueish green color. It has a smooth, even surface brightness and no central star is visible in the 14" telescope. It's a really ghostly, distant, planetary nebula!

NGC 6751 A planetary nebula in the constellation Aquila about 6,500 light years away from us. According to the Astronomical League, this is the "Dandelion Puff Ball". It has also been called the "Glowing Eye Nebula". In the telescope it is a small planetary nebula but relatively easy to find at 190x. It is about 20" in diameter and shines at magnitude 12. It appears brighter at center, but no central star was visible in the 14" telescope. It's not quite round and there is a dim little star just 20" east of the nebula.

UX Draconis A red carbon star about 1,600 light years from Earth in the constellation Draco. It is a semi-regular variable star with a nominal period of 168 days but with a period that ranges from roughly 158 to 336 days. Its brightness varies from magnitude 5.9 to 7.1. In the telescope it glows with an orange color, maybe not as red as some of the other red stars like V Aquilae and T Lyrae, but still a nice contrast against the other stars in the field of view.

NGC 6802 An open cluster located in the constellation Vulpecula. The distance to NGC 6802 is listed as 3,700 light years in older catalogs. However, the most recent data from the Gaia space telescope gives a much farther distance of $8,500 \pm 300$ light years. In the telescope, the cluster is framed in a square of stars. There are two 9th magnitude double stars on the northern side of the cluster. Two single 10th magnitude stars complete the frame on the southern side. NGC 6802 is rectangular in shape, about 2' x 4' and oriented N-S. In a 14" telescope, about a dozen stars can be resolved with the rest of the unresolved stars providing the background glow of the cluster.

M 27 The Dumbbell Nebula (M 27) is a big, bright planetary nebula in Vulpecula located at a distance of 1,360 light years from us. Transiting about 50 minutes after midnight, M 27 is well placed in the sky at ESP 2026. Make sure to use both low and high powers to observe this object. At low powers the dog bone or dumbbell shape of the nebula is apparent and runs mostly N-S. At high powers (>200x) the central star is easily visible, and the delicate, mottled structure of the nebula will show well under the dark skies of the X Bar Ranch.

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Webb 9 Webb 9 (also cataloged as HD 189864 or SAO 69252) is a multiple star system in the constellation Cygnus located about 980 light years from us. Four stars make up Webb 9. The brightest is magnitude 6.7 and glows white to blueish white. The other three companions are arranged in a short arc about 1' to the southwest of the brightest member. The second brightest member is on the east end of the arc and glows at magnitude 8.8 with a reddish hue. The remaining two companions shine with a white glow at magnitude 9.6 and 10.6. A true patriotic red, white and blue multiple star!

Poskus 1 An asterism in Delphinus, also known as “The Flyswatter”. Some people say it looks like a mandolin. It’s a nice asterism about 7’ x 2’ in size, made up of about nine 11th magnitude stars arranged in the shape of a flyswatter. It is oriented in a NE-SW direction. Four stars on the southwest are arranged in a small rectangle about 2’ x 1’ in size. Five more stars form a line off to the northeast from the rectangle making the handle of the flyswatter.

Gamma Delphini A double star in Delphinus marking the nose of the dolphin. It is located at a distance of 115 light years from us. The pair has similar brightness and color. Separated by 8.7” and oriented in a mostly N-S direction, they will be easy to split. The brightest component is magnitude 4.4 and yellow. The second component is magnitude 5.1 and is slightly whiter in color.

B 353 Barnard 353 is a dark nebula in the constellation Cygnus approximately 2,000 light years from us. It shows as a moderately dark, rectangular patch of sky about 5' x 14' in size. It doesn't completely obscure the background stars, but it is apparent in contrast to the background stars of the Milky Way. There is an interesting asterism of about a dozen stars forming a little scorpion on the east side of B 353. A triangle asterism, made of 8th, 9th, and 10th magnitude stars, shows on the south side. A nice field of view, but it might be a little hard to find, so use low power and sweep just 2.7 degrees east of Deneb to find it.

Pismis-Moreno 1 An interesting open cluster in Cepheus that forms an asterism about 15' in size that looks like a witch’s hat. It is located about 3,000 light years from us. The dozen or so stars forming the cluster range from magnitude 7.5 to magnitude 13. Some say it looks like a sailboat floating on a calm sea. The diffuse nebula Sharpless 2-140 is involved with the cluster and causes a faint glow to show around the stars. Use a UHC or O III filter to bring out the faint nebula.

NGC 7332 & NGC 7339 Located in the constellation Pegasus, NGC 7332 and 7339 are a nice pair of edge-on galaxies in the same field of view. NGC 7332 is an edge-on, peculiar lenticular galaxy. NGC 7339 is thought to be an edge-on, Sbc spiral galaxy. They are gravitationally bound to each other and located about 67 million light years from Earth. Both are reasonably bright and approximately the same size. NGC 7332 is on the western side and is brighter than 7339. It has a concentrated core that shows some bulging and appears stellar at times. NGC 7339 is about 5' to the east of 7332 and oriented E-W. Both galaxies will show some mottling on good nights.

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NGC 7619 An elliptical galaxy in the constellation Pegasus located some 170 million light years distant. There are at least seven more galaxies in the same field of view with NGC 7619. Three of them are relatively easy galaxies to see. 7619 and 7626 are the brightest at magnitude 11.0 and 11.1 respectively. They have similar appearances, both mostly round, about 1' in diameter, with smooth surface brightness and not much core concentration. NGC 7626 is about 7' to the east of 7919. 7623 forms a triangle with 7619 and 7626 about 10' to the north. It is dimmer and slightly elongated N-S about $1' \times 0.6'$ in size. NGC 7631 is located about 11' east 7626. It is elongated E-W about $2' \times 0.5'$. There is a nice little triangle asterism to the northeast of 7631. Halfway between 7626 and 7631 and slightly to the south, two small dim galaxies sometimes show with averted vision. These are UGC 12535 and MAC 2321+0810. Further to the north is PGC 71159 which also shows with averted vision. It's dim and small. Moving southwest about 12' from 7619, NGC 7611 also appears as a dim elongated smudge about $1' \times 0.5'$ in size. A really interesting field of galaxies!

Little Ladle Located in the constellation Pisces; this neat little asterism consists of 9 stars arranged in the shape of a little ladle. They range in brightness from magnitude 8 to magnitude 12. The asterism is about 15' in size and shows best at around 100x.

NGC 1 & NGC 2 The first two entries in John Louis Emil Dreyer's *New General Catalog*! They are located adjacent to each other in the constellation Pegasus. Although visually close, NGC 1 and NGC 2 are at very different distances from us; NGC 1 is about 185 million light years distant, and NGC 2 is farther away at 305 million light years. Both are intermediate spiral galaxies; NGC 1 being classified as a Sbc spiral and NGC 2 as a Sab spiral. NGC 1 is on the north apex of a small triangle that it forms with two stars, one shining at magnitude 11.5 and the other at magnitude 12. NGC 1 is fairly small, about $1.5' \times 1'$ and oriented in the ESE-WNW direction. NGC 2 is smaller, about $1' \times 0.5'$ and dimmer about 2' south of NGC 1. It was harder to detect than NGC 1. Neither galaxy shows much core concentration.

Arp 227 A pair of interacting galaxies consisting of NGC 470 and NGC 474. They are located in the constellation Pisces at a distance of about 100 million light years from us. NGC 474 is a large lenticular galaxy and NGC 470 is a neighboring spiral galaxy. The two galaxies are gravitationally bound and interacting. Visually NGC 474 appears in the telescope as a small relatively bright circular glow about 2' in diameter, much smaller than the 7' catalog size. Averted vision seems to show a grainy surface and maybe a stellar core. NGC 470 is also easy, about 5' to the west of 474. Visually it is larger; about $3' \times 1.5'$ in size and oriented mostly N-S. NGC 470 has a somewhat irregular shape to it and some core concentration shows with averted vision. A third galaxy, NGC 467, is also in the neighborhood of Arp 227. Moving 15' to the southwest of NGC 474 will show the glow of NGC 467. It's the dimmer of the three but still relatively easy. Mostly round shape about 1.5' in diameter. Some core concentration but not stellar. A pair of stars shining at magnitudes 7.5 and 10 are adjacent, about 4' east of NGC 467

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M 103 A beautiful open cluster located in Cassiopeia, about 9,400 light years from Earth. The cluster is about 6' in size with about 40 members. The members of this cluster range from magnitude 7 to magnitude 12 and are arranged in a triangular pattern that suggests a 5-pointed star. Inside the cluster there is a lovely 10th magnitude red giant star. At the northern apex of the triangle is the relatively bright double star, Struve 131. The components of Struve 131 are magnitude 7.3 and 9.9. With a separation of 14", this double can be easily split even at lower powers.

NGC 672 A spiral galaxy in Triangulum, NGC 672 is approximately 23 million light years distant. It is interacting with IC 1727, a smaller nearby irregular galaxy. In a 14" telescope, NGC 672 shows as a dim smudge oriented mostly ENE-WSW about 6' x 2' in size. It has no real core concentration, just a slight brightening near the center of the galaxy. IC 1727 can be seen in the same field of view as a very dim streak about 8' to the SW of NGC 672. Interesting field of two interacting galaxies!

NGC 772 NGC 772 is also known as Arp 78. It is a large spiral galaxy in the constellation Aries, about 106 million lights years from Earth. The tidal action of a nearby satellite galaxy, the dwarf elliptical NGC 770, has probably caused the distortion that resulted in the prominent outstretched spiral arm of NGC 772 on its northern side. In the eyepiece it will show as an oval glow about 4' x 1.4' in size, oriented in the SE-NW direction. It shows some core concentration but not quite stellar. The surface is slightly mottled and has hints of extension on either end of the galaxy. NGC 770 is also visible in field just 3.5' south of Arp 78. It is small and mostly round, maybe about 1' in diameter.

Kaffaljidhma Gamma Ceti or Kaffaljidham is a triple star in the constellation Cetus about 80 light years from Earth. The bright A and B components are very close, about 2.6" apart. The A component shines at magnitude 3.5 and the dimmer B component at magnitude 6.6. If the seeing permits you should be able to detect the pair at around 200x and easily split them at around 500x. There is some color contrast between the pair, the brighter A component is a type A3 star and should appear blueish, and the dimmer B component is a type F3 star and should have yellow tint. The C component is a 10th magnitude orange dwarf (type K5) located 14' from the A component at position angle of 306° (NW). The large separation between them makes it difficult to single out the C component from all the other stars in the field. If you decide to hunt down the C component, it has the designation BD+02 418 and is also listed in the GSC catalog as GSC 50 27 and the Tycho-2 catalog as TYC 00050-0027 1.

NGC 1400 An elliptical galaxy in the constellation Eridanus, NGC 1400 is located some 82 million light years from Earth. It is a relatively bright, round patch of light about 2' in diameter. The core of NGC 1400 is concentrated and appears stellar at times. Looking 11.7' to the northeast of NCG 1400, you should see NGC 1407, another larger elliptical galaxy. NGC 1407 is about 4' in diameter and also has a somewhat concentrated but not quite stellar core. Look carefully in the field and you may see a third galaxy, NGC 1402, a small lenticular galaxy located at the northwest apex of an equilateral triangle formed with NGC 1400 and 1407.

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M 38 Also known as the “Starfish Cluster”, M 38 is an open cluster in Auriga about 3,500 light years from Earth. When using an eyepiece that gives a 30’ field of view, M 38 will fill the view with countless stars ranging from magnitude 8 to magnitude 13. The pattern of stars suggests an irregular arrowhead and to some people the Greek letter Pi. Walter Scott Houston mentions in *Deep Sky Wonders* that some observers report that in small instruments the stars in the cluster form a cross shape. However, in larger apertures he says, “the host of stars made fruitless any effort to find a geometric figure”. Before leaving M 38, move south about 32’ and you should be able to pick up a smaller open cluster, NGC 1907. It's much smaller than M 38, around 5' diameter, and has fewer stars.