

The Eldorado Star Party

2018 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 listed while you are at the Eldorado Star Party to receive a club badge.

Propinquity

noun | pro·pin·qui·ty | \prə-'piŋ-kwə-tē\ : *proximity or physical closeness; from the Latin word propinquitas meaning nearness or proximity.*

The telescope program, “**Propinquity**,” is a list of 24 groups of objects. Each group in the observing list consists of two or more objects that can be observed together in the same field of view of most amateur telescopes. A total of at least 71 objects are contained in the 24 groups with magnitudes ranging from 3.8 to 14.4. As a result, this year’s program provides a real bonus of observations that can be made while locating only 24 targets.

You only need to observe **20 of the 24 groups** on the list with a telescope to qualify for the Telescope Observing Club badge. Although part of the challenge is to observe as many of the objects in a group as possible, you only need to observe **2 objects** in a group to get credit for observing the group.

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 field 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!

Propinquity

Group	Objects	Object Types	Con	RA 2000	DEC 2000	Mag Range	Date	Time
1	M71, Harvard 20 & 9 Sge	Glob, OpnCl & Var Star	Sge	19h53m31.5s	+18°34'04"	6.2 to 8.4		
2	52 Cyg & Veil Nebula	Dbl Star & Neb	Cyg	20h45m39.7s	+30°43'11"	4.2 to 7.0		
3	NGC 7332 & 7339	2 Galaxies	Peg	22h37m33.2s	+23°47'24"	12.0 to 13.1		
4	Neptune & Triton	Planet & Moon	Aqr	23h00m44.1s	-07°23'58"	7.9 to 13.5		
5	NGC 7465, 7464 & 7463	3 Galaxies	Peg	23h01m55.1s	+15°58'24"	13.4 to 14.4		
6	NGC 7619, 7626, 7631, 7623 & 7611	5 Galaxies	Peg	23h20m32.8s	+08°10'11"	12.1 to 13.9		
7	NGC 7769, 7770 & 7771	3 Galaxies	Peg	23h51m13.2s	+20°07'49"	12.5 to 14.4		
8	NGC 7782, 7778, 7779, 7780 & 7781	5 Galaxies	Psc	23h53m33.0s	+07°59'30"	13.1 to 14.4		
9	NGC 7788 & 7790	2 Open Clusters	Cas	23h57m42.1s	+61°16'16"	7.2 to 9.4		
10	WZ Cas & STI 1248 (Stein 1248)	2 Multiple Stars Systems	Cas	00h00m49.7s	+60°23'50"	7.0 to 10.3		
11	NGC 133, 146 & King 14	3 Open Clusters	Cas	00h32m02.8s	+63°16'08"	8.5 to 9.6		
12	NGC 383, 384, 385, 382, 380, & 379	6 Galaxies	Psc	01h07m24.8s	+32°24'42"	13.1 to 15.5		
13	Mirach & Mirach's Ghost	Multiple Star & Galaxy	And	01h09m27.0s	+35°43'05"	2.0 to 11.2		
14	M103, Red Giant & Struve 131	OpnCl, Star & Dbl Star	Cas	01h33m23.0s	+60°39'00"	6.9 to 9.9		
15	M33 & NGC 604	Galaxy & Emission Neb	Tri	01h33m50.9s	+30°39'36"	6.4 to 14.0		
16	Uranus, Titania, Oberon, Ariel & Umbriel	Planet & Moons	Ari	01h51m04.2s	+10°49'23"	5.69 to 15.0		
17	NGC 1042, 1035, 1052 & 1047	4 Galaxies	Cet	02h40m12.2s	-08°16'28"	11.4 to 14.5		
18	M 77 & NGC 1055	2 Galaxies	Cet	02h42m11.6s	+00°12'57"	9.7 to 11.4		
19	NGC 1325, 1332, & 1331	3 Galaxies	Eri	03h25m20.4s	-21°25'39"	11.2 to 14.3		
20	NGC 1400 & 1407	2 Galaxies	Eri	03h39m47.8s	-18°38'18"	10.7 to 12.0		
21	NGC 1625, 1622, 1618 & Nu Eri	3 Galaxies & Dbl Star	Eri	04h36m30.6s	-03°16'18"	4.0 to 13.4		
22	Sigma Ori & Struve 761	2 Multiple Star Systems	Ori	05h38m39.6s	-02°35'00"	3.8 to 8.6		
23	M35 & NGC 2158	2 Open Clusters	Gem	06h08m25.0s	+24°16'20"	5.6 to 12.1		
24	M46 & NGC 2438	Opncl & PNe	Pup	07h41m46.0s	-14°48'36"	6.6 to 11.0		

Propinquity – Observing List Notes

Observing List Notes & Comments

The RA and Dec coordinates provided in the observing list were chosen to best center the group of objects in the field of view of the telescope. The objects in the groups were also selected so that they could fit within a single field of view of no greater than 40 arcminutes. Only a few of the groups require this wide of a field and may show better at higher powers. Once you have located a group, try different eyepieces to see which power shows the group the best.

Observing lists in SkyTools, SkySafari, Excel and other formats are also available for download on the ESP website. For this year's program, the list provided in these formats will contain only a single member of the group. Observers can locate this object first and then manually center the group in the eyepiece to reveal all the members of the group.

Observing Notes

The following notes were made while observing the objects in this year's program with a 14" telescope under the dark sky conditions available at the Eldorado Star Party. Some abbreviations have been used in the notes to shorten the content.

FoVField of View

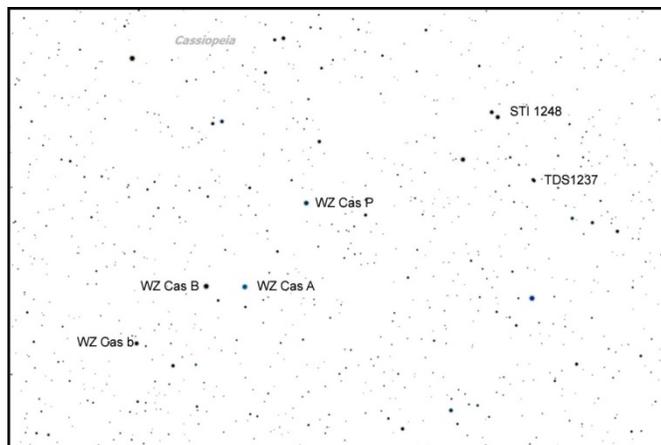
AV.....Averted Vision

Sky directions have also been abbreviated as N for North, NE for North East, NNE for North-North East, etc.

1. **M71, Harvard 20 & 9 Sge** Placing M71 in the NNE side of a 40' FoV, Harvard 20 shows as a loose grouping of about 15 stars arranged in an irregular shape on the SSW side. Harvard 20 is about the same size as M71, about 6' in size. At magnitude 6 the variable star 9 Sge shines brightly in the NW corner of the FoV.
2. **52 Cyg & Veil Nebula** Perhaps we have all observed and admired the western part of the Veil Nebula that is anchored with 52 Cygni, a bright magnitude 4.2 star. But 52 Cygni also has a magnitude 9.5 companion located about 6" away. Use some power to reveal this beautiful double star embedded in the Veil.
3. **NGC 7332 & 7339** A nice pair of edge-on galaxies in the same FoV. Both reasonably bright and approximately the same size. NGC 7332 is brighter and toward the western side of the field. 7332 has a concentrated core that 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.
4. **Neptune & Triton** The clear dark skies at the Eldorado Star Party provide a good opportunity to hunt down the dimmer moons of the outer planets. Neptune will be glowing brightly at magnitude 7.9 but look carefully for its moon Triton located about 13" from Neptune and glowing dimly at magnitude 13.5.
5. **NGC 7465, 7464 & 7463** Three galaxies in the same FoV. NGC 7465 is mostly round and dim. It has some core concentration but not much. NGC 7463 shows as a thin dim streak to the W and slightly N of 7465. With averted vision NGC 7464 shows as a dim round glow just SE of 7463.

Propinquity – Observing List Notes

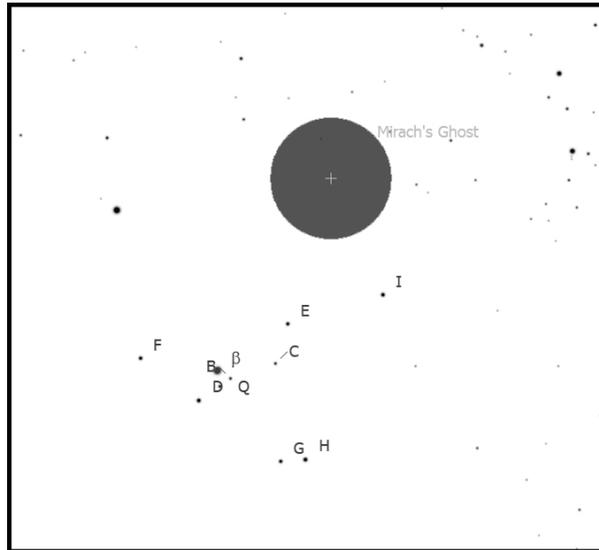
6. **NGC 7619, 7626, 7631, 7623 & 7611** Five galaxies in the same FoV. Three of them are relatively easy galaxies to see. 7619 and 7626 have similar appearance both mostly round about 1' in diameter. 7626 is about 7' to the E of 7919. Both have a smooth surface brightness with not much core concentration. 7623 forms a triangle with 7619 & 7626 about 10' to the N. It is dimmer and slightly elongated NS about 1' × 0.6' in size. NGC 7631 is located about 11' east 7626. It's elongated EW about 2' × 0.5'. There is a nice little triangle asterism to the NE of 7631. Halfway between 7626 & 7631 and slightly to the S, two dim small galaxies show sometimes with AV. These are UGC 12535 and MAC 2321+0810. Further to the north is PGC 71159 also shows with AV. It's dim and small. Moving SW about 12' from 7619, NGC 7611 also shows as a dim elongated smudge about 1' × 0.5' in size. Really interesting field of galaxies!
7. **NGC 7769, 7770 and 7771** Three galaxies in the same FoV. NGC 7769 is round, about 1.5' in diameter. With AV the core sometimes appears stellar. 7770 and 7771 are ESE of 7769 by about 6'. NGC 7771 is elongated EW and about 2' × 0.5' in size. AV shows a brighter streak at the core. 7770 is just S off the W end of 7710 and shows as a small round smudge about 0.25' diameter.
8. **NGC 7782, 7778, 7779, 7780 & 7781** Another nice field of galaxies anchored with 7782 which is oval shape about 2' × 0.5' oriented NS. To the S running EW there are three galaxies. 7778 & 7779 are on the W of this line and nestled next to each other. Both are dim, mostly round glows of about 1' in diameter. Going E from these two by about 6' is a dim little smudge which is 7781. About 15' N of 7779 is 7780 which shows as a very dim smear about 1' × 0.5' oriented NS.
9. **NGC 7788 & 7790** Two open clusters in the same FoV. NGC 7788 in NE side of a 40' FoV and 7790 is to the SW side. 7790 is about twice as big as 7788 and has about twice as many stars. 7790 appears about 10' in diameter and 7788 appears about 5' in diameter. Sort of looks like a miniature Double Cluster.
10. **WZ Cas & STI 1248 (Stein 1248)** Two multiple star systems in the same FoV. WZ Cas is a carbon star that glows at magnitude 7 with a ruddy hue. It has 3 companions which can be located using the chart below. For scale, the distance between companion A and B is 58". STI 1248 is a double star located 7.5' to the NW of WZ Cas. The components of STI 1248 shine at magnitude 10 and are separated by 12". For a challenge there is another double star in this field. TDS1237 is located SW of STI 1248 by about 2'. This double is composed of two magnitude 12 stars separated by 1.8".



Propinquity – Observing List Notes

11. **NGC 133, 146 & King 14** Three open clusters in the same FoV arranged in an equilateral triangle. NGC 133 is the brightest but also seems to be the sparsest. About half dozen stars magnitude 9 to 10 arranged in an arrow shaped configuration on the SW corner of the triangle. NGC 146 is on the E side and is composed of about 15 magnitude 11 to 12 stars. It's looser than NGC 133. King 14 is on the S point of the triangle and is the loosest of the three clusters.
12. **NGC 383, 384, 385, 382, 380, & 379** The Pisces Cloud. Six galaxies in the same FoV! They are arranged in even a slightly curving line running N-S. NGC 383 anchors the group in the middle of the line. NGC 382 is nestled just adjacent to 383 and shows as a small round spot. For a challenge see if you can also detect NGC 386 and 388. NGC 386 is about 3' to the SSE of 383 and NGC 388 about 5' to the E of the curvy line at the S end.

13. **Mirach & Mirach's Ghost** Mirach Ghost (NGC 404) is a dwarf lenticular galaxy and located just 7' NNW of the magnitude 2 star, Mirach. Although close to 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.



14. **M103, Red Giant & Struve 131** M103 is pretty open cluster about 6' in size with about 40 members. There members of this cluster range from about magnitude 7 to 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 should be easily split even at lower powers.
15. **M33 & NGC 604** Under clear dark skies, the galaxy M33 presents opportunities to observe a variety of different structures and objects in our close neighboring galaxy M33. Spiral arms, globular clusters and star clouds can all be observed when the sky is dark and transparent. One of the easiest to observe is the emission nebula NGC 604 located in one of the spiral arms of M33. After locating M33, see if you can track down NGC 604 located about 12' to the NE of the center of the Galaxy. While

Propinquity – Observing List Notes

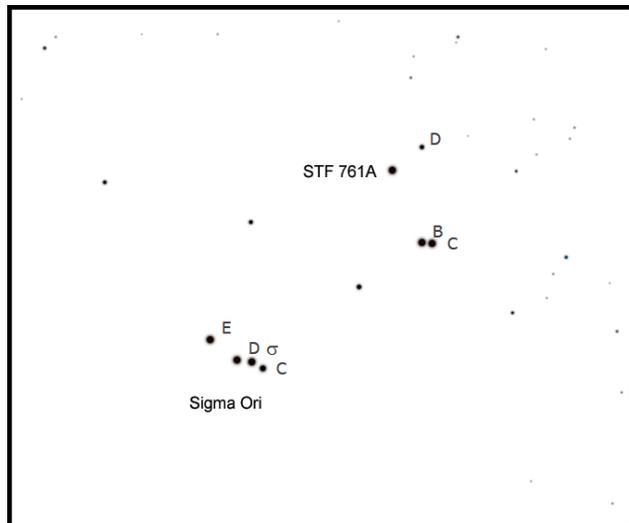
there see if you can also track down 3 other NGC objects that are actually part of the galaxy. NGC 595 is an HII region located 4' NW of the core of M33. NGC 592 is a small knot in one of the spiral arms located 8.5' W of the core and NGC 588 is an emission nebula located 14' W of the core. With a 40' FoV centered on M33 all four NGC objects will be in the same FoV.

16. **Uranus, Titania, Oberon, Ariel & Umbriel** Uranus is bright at magnitude 5.7 and the four moons Titania, Oberon, Ariel & Umbriel range in magnitude from 13.9 to 15.0. You may need to use some power to observe these moons but the dark skies of West Texas should help you hunt them down. They will all be within 1' of Uranus. See how many of these four dim moons you can spot.
17. **NGC 1042, 1035, 1052 & 1047** Four galaxies in the same 40' FoV. NGC 1042 is a broad dim round smudge about 3' in diameter. It's harder to see than the 1035 and 1052 because of the low surface brightness. Placing NGC 1042 on the S half of the 40' field will show NGC 1035 to the NW about 23' away from 1042. NGC 1035 looks edge on. Looking over to the E side of the FoV should show NGC 1052. It is round shaped about 2' in diameter. It's harder to see than the other two because of the low surface brightness. Look carefully about 10' to the NW of NGC 1052 and with AV you may be able to detect the magnitude 15 galaxy NGC 1047.
18. **M77 & NGC 1055** Two galaxies, M77 & NGC 1055 in the same FoV. M77 is bright and round with a condensed core that appears stellar at times. It's about 3' in diameter and lies on the SSE edge of the FoV. NGC 1055 lies about 31' to the NNW of M77. It's dimmer and more elongated running mostly EW and about 4' × 1' in size. It's located just below a magnitude 11 star which makes for an interesting view. With a FoV of about 40' you may also be able to detect a third galaxy, NGC 1072, shining at magnitude 14 on the E side of the FoV.
19. **NGC 1325, 1332, & 1331** Three galaxies in the same FoV. NGC 1325 is elongated in the SW-NE direction about 3' × 1' in size. The surface brightness appears relatively smooth with a magnitude 14 star embedded slightly off center. Placing NGC 1325 in the SW corner of the field, NGC 1332 will show on the ENE side of a 40' FoV. It is elongated NW-SE and about 4' × 1' in size. The core is concentrated and appears stellar at times. NGC 1331 is a small round smudge, approximately 1' in size, just off the SE end of NGC 1332. Look carefully and you may be able to see a fourth galaxy in this field 20' W of NGC 1332. This galaxy is NGC 1325A glowing at magnitude 13.3.
20. **NGC 1400 & 1407** Two relatively bright round galaxies in the same FoV. NGC 1407 is the larger one located on the NE. It's about 4' in diameter and has a concentrated, but not quite stellar, core. NGC 1400 is smaller, about 2' in diameter and located on the SW side of the field. It's about 12' away from NGC 1407. Its core is also concentrated and appears stellar at times. Look carefully in the field and you may see a third galaxy, NGC 1402, located at the NW apex of an equilateral triangle formed with NGC 1400 and 1407.

Propinquity – Observing List Notes

21. **NGC 1625, 1622, 1618 & Nu Eri** NGC 1625 is located just 10' NE of Nu Eri which is a magnitude 4 double star. The glare from Nu Eri may make it a little hard to see the galaxy. In addition to NGC 1625 there are two other galaxies, NGC 1622 and NGC 1618. All three galaxies are arranged like a fan with Nu Eri at the base of the fan. NGC 1622 is about $1.5' \times 0.2'$ in size. It has a wispy appearance with some moderate core concentration. NGC 1625 is 11' to the SW of 1622. It's oriented NW-SE perpendicular to 1622. It's brighter than 1622 and maybe slightly larger at about $2' \times 0.5'$ in size. NGC 1618 is also in the FoV about 9' WNW of 1622. It's dimmer and smaller about $1' \times 0.4'$ in size. Being close to Nu Eri makes it easy to locate the field containing these galaxies but the glare from Nu Eri may make it a little hard to see them when sky transparency is not good. Also be sure to look carefully for Nu Eri's 13th magnitude companion star just 51" to the S of Nu Eri.

22. **Sigma Ori & Struve 761** Two multiple star systems in the same FoV. Sigma Ori is a 4th magnitude star in Orion located about 50' SW of the easternmost belt star of Orion. It has four components located in a somewhat wiggly line running NE to SW. The primary of Sigma Ori is actually composed of two stars but with a separation of only 0.24" it would be extremely difficult to split this pair. But if the seeing is very steady try some power on it and see if you can split it! Struve 761 has four easily split components and is located 3' to the NW of Sigma Ori.



23. **M35 & NGC 2158** Interesting contrast of two open clusters. M35 is large and bright, about 25' in diameter. It's composed of hundreds of stars ranging in magnitude 8 to 12. Placing M35 on the NE corner of the field you should see NGC 2158 located about 28' away on the SW corner of the FoV. NGC 2158 is about 5' in diameter, is more condensed than M35 and consists of countless more stars than M35. It almost has the appearance of a globular cluster.

24. **M46 & NGC 2438** Rising around midnight and transiting around 5:10 a.m. during ESP 2018, you might be tempted to pass on these two objects. However, those who are willing to stay up late and observe them after they have reached a good altitude will not be disappointed. M46 is beautiful open cluster about 25' in size composed of countless stars. It will fill the eyepiece when observed at around 100x. Look carefully about 10' N of the center of M46 and you will find the small planetary nebula, NGC 2438, embedded in the stars of M46. NGC 2438 is about 1' in diameter and will show as a small smoke ring especially at higher powers. Use a UHC or OIII filter to make the planetary nebula pop out from the background cluster.