

## Advanced List

### Welcome back!

Each of the objects on this list has its own page itemizing what it is, why it's interesting to observe, and the criteria for a successful observation. Also included are the constellation of each object, coordinates, and a photo showing what the object looks like - all you have to do is find, observe, and record your observations. I hope you enjoy the challenge.

Note – you will need your own detailed finder charts for these objects. Paper or computer charts are equally acceptable. *You'll also need to research some of this year's objects to be sure you're observing exactly what's being asked for.*

Star hopping, push-to and goto are all appropriate ways to find these objects.

### Stretch your skill and imagination - see something new, something unimaginably old, something unexpected

- Even though this is a challenging list, you don't need twenty years of observing experience or a 20-inch telescope to successfully observe ten of these objects.

The only way to know if you can see these objects is to have a look for yourself.

- The visibility of each object assumes dark, transparent, steady and non-smoky OSP observing conditions.

### Requirements to receive a certificate

1. **To receive the observing certificate, you need to have descriptive notes and/or sketches that clearly show you observed any ten (10) of the objects on this year's list.**
2. Simply noting that you saw ten objects doesn't count.
3. Observers who successfully observe ten objects also receive a cool observing pin.

When finished, bring your record of observations to the Observing Program table next to the Information Tent to receive your pin. *Please check the information tent for updates on when the Observing Program table will be staffed, and where it is going to be for the next session. Typically it will be manned later in the afternoon.*

## 2023 Oregon Star Party Advanced Observing List

2023 Oregon Star Party Advanced Observing List						Criteria for successful observation - observe any 10 objects to qualify for the Level 3 certificate and pin.
Object	Object type	RA	Dec	Constellation	V Mag	
Cygnus Loop = Veil Nebula	Supernova remnant	RA 20 51 18	Dec +30 58 34	Cygnus/Vulpecula	various	Observe 3 of 5 areas of the Cygnus Loop detailed in the Level 3 Observing List.
Minkowski's Footprint	Protoplanetary nebula	RA 19 38 18	Dec +29 33 00	Cygnus	11.7	See both lobes of the "footprint".
M16 Pillar's of Creation	Emission nebula	RA 18 18 43	Dec -13 48 00	Serpens	n/a	Observe the dark silhouettes of the Pillars of Creation, and the Black Spire to their northeast.
NGC 523 = Arp 158	Triple galaxy merger	RA 01 25 20	Dec +34 01 28	Andromeda	14.5	Observe the merger plus the tidal tail.
NGC 67 through 72 = Arp 113	Galaxy cluster	RA 00 18 15	Dec +30 03 48	Andromeda	various	Observe any ten galaxies within this galaxy cluster.
ESO 456-38	Globular cluster	RA 18 01 49	Dec -27 49 33	Sagittarius	?	See the faint glow of the globular within the dense Milky Way starfield.
Nova Nebula in M22	Nova nebula	RA 18 36 26	Dec -23 54 35	Sagittarius	?	Find the location of the nova nebula.
NGC 6745, the Bird Galaxy	Triple galaxy merger	RA 19 01 41	Dec +40 44 37	Lyra	13.3	Observe the main galaxy clump, and the faint extension off its northern tip.
M57	Planetary nebula	RA 18 53 35	Dec +33 01 44	Lyra	n/a	Observe 2 of 3 portions of M57 detailed in the Level 3 Observing List.
M8	Emission nebula	RA 18 04 03	Dec -24 18 00	Sagittarius	n/a	Observe 2 of 3 areas of M8 detailed in the Level 3 Observing List.
Sancho's Object	Galaxy pair	RA 15 10 17	Dec +58 10 39	Draco	15.0 / 17.0	See both galaxies.
I Zw 136	Galaxy pair	RA 16 13 31	Dec +51 03 39	Hercules	15.4 / 15.7	See both galaxies.
Tulip Nebula = Sh2-101	Emission nebula	RA 19 59 55	Dec +35 21 00	Cygnus	10.07	Observe the two dark lanes.
Cygnus X-1	Stellar-mass black hole's companion star	RA 19 58 22	Dec +35 12 06	Cygnus	8.95	Observe the star that's orbiting the black hole. Bonus - observe the bow shock of Cygnus X-1
4/25/2023 v1.0						