Chairman's Challenge 2018

It's that time of year again when the society goes off for the summer and we are looking forward to lovely, cloudless nights filled with uninterrupted observing. The long range weather forecast even suggests that might actually! be a reality this year too! So, once again we are giving you the Chairman's Challenge. A list of objects for you to observe over the summer months.

This year we've extended the challenge into autumn so we have a few objects for you to observe over the late spring/early summer and some for the late summer/early autumn. We've tried to get a range of objects for you to spot, some easy to find, some more challenging. Whatever you observe, let us know how you get on!

1. **The Perseid Meteor shower**. This annual meteor shower is one of the better ones which tends to give higher numbers of meteors to spot than some of the others. This year the shower peaks on the nights of 12th and 13th August, which luckily falls on a new moon, meaning the skies will be nice and dark. Meteors are visible from as soon as it gets dark but the best time to go out is after 11pm. The brilliant thing here is there is n need for any equipment other than a blanket. Just find the darkest spot you can and lie back and enjoy. Can you spot the subtle colours of the meteors?

2. **The Planets**. We're lumping them all together a little here but Mars, Saturn and Jupiter are all visible in the evening skies over the next few weeks. None are at their best positionally. All are low down in the Southern sky, they are all visible though and definitely worth trying to view. In binoculars you will get a definite disc (as apposed to a point of light when looking at a star). You will be able to see the red of Mars and the Galilean moons of Jupiter. If you have a telescope you will be able to pick out more detail, the rings of Saturn and the GRS of Jupiter, (assuming it's facing the right way). To find the planets look to the southern skies shortly after sunset. Jupiter and Saturn are fairly obvious as bright points of none twinkling light. Mars is a little harder to spot and very low down but you should be able to spot it as a bright red 'star'. Planetary observing is great to get your eye in for details and the perfect time to practice drawing at the eyepiece.

3. **Cor Coroli**. Cor Coroli is a double star which is relatively easy to find and split. The primary is white/blue white and it's companion is a more orange star. It is found about half way between Arcturus (remember arc to Arcturus) and Phad/Phecda (the star which makes the bottom left hand corner of the plough). It's fairly bright so hopefully won't take too much finding. Let us know if you can spot and determine the colour differences between the stars.

4. **Bode's Galaxy (M81)**. This is a lovely 'face on' galaxy in Ursa Major which which will show as an obvious oval in your eyepiece. A little bit more challenging to find but when you do find it, it is easy to see and really worth the time. It does need a telescope to view but it doesn't need to be a powerful one. To find it, look at the bowl of the plough, draw a line from the bottom left hand star of the bowl (Phad/Phecda which we used to find Cor Coroli) and draw a line to the top right hand star of the bowl (the brighter Dubhe). Bode's galaxy is about the same distance again if you follow that line, shifting slightly to the left. It has a companion with it, the slightly harder to spot M82, another galaxy, this time seen edge on and shaped like a cigar.

5. **The Whirlpool galaxy (M51)**. A beautiful galaxy again found in Ursa Major. It doesn't need a large telescope to view it but if you have got an 8" or larger and a nice dark sky it is possible to make out the spiral arms in this one. It was the first galaxy to be seen to have a spiral structure. It's a really lovely object to view (one of my favourites!) and like M81 comes with a little friend you might be able to pick out (the delightfully named NGC 5195). In a smaller telescope they will look like a fuzzy double star but a larger telescope will give you a little more detail. To find this, find Alkaid (the last star of the plough's 'handle') and move lowly towards 5 o'clock on a clock face. Why not come up to an observing session over the summer and ask us for help to find it. We should be able to spot those spiral arms up in the observatory.

6. **Summer Beehive (IC 4665)**. This is an open cluster and like most star clusters looks best through a pair of binoculars, though you can appreciate it through a telescope. It's relatively young in astronomical terms so you'll notice that the stars are almost all white/blue in colour, few of them have progressed to being red giants yet. The Summer Beehive is found in the constellation of Ophiuchus. Ophiuchus is found between Aquilla and Libra and makes the shape of a house tipped on it's side (That's how I always see it anyway). IC 4665 is found slightly above the left hand top corner of the house. In a nice dark sky you might even be able to spot it with the naked eye. It should be pretty obvious in binoculars; several bright blue white stars jump out at you. A lovely object if you fancy our hand at imaging.

7. **The Wild Duck Cluster (M11)**. Not quite as easily spotted as the Summer Beehive but worth a go. Best seen in a telescope (and this is one of those bigger the better cases I'm afraid!) but visible in binoculars too. There are quite a lot of stars in this cluster, all very close together. Mostly they are bright white/blue stars, but you should be able to see a few older red giants too. To find m11 which is in the constellation of Scutum, you need to find Altair, one of the stars of the summer triangle and follow the line down the spine of Aquila the eagle down to Delta Aquilae (the fourth brightest star in Aquila). This is about 8 degrees to the southwest (hold 4 fingers up at arm's length to get some idea of what 8 degrees looks like). Once you have found this you need to follow the same line in the same direction for approximately another 8 degrees and there you will find M11. Can you spot the few red giants?

8. **Caroline's Rose (NGC 7789).** This is a big star cluster discovered by (and named after) Caroline Herschel. Unlike the other two star clusters on the list so far it is very old (estimated at well over a billion years old) and most of the stars in it are red giants or supergiant's. NGC 7789 is found in Cassiopeia. The star at the 'tight' end of Cassiopeia's W shape is called Caph (beta cas), move southwest from Caph to find two bright stars (each of these has a nearby dimmer companion). Caroline's Rose is directly between these two stars. Not always the easiest star cluster to spot, but possible with patience even with city light pollution. Have a look and see if you can see why it was called Caroline's Rose.

9. **The Owl Nebula (M97**). For those of you that want a little more of a challenge, the Owl nebula is a really lovely object to view in the constellation of Ursa Major. It's visible all year round but better

and easier viewed towards autumn as Ursa Major is a little higher in the sky again. You'll need dark skies to spot this nebula and a bit of patience. It is possible in larger binoculars (apparently) but best done with a telescope. It will appear as a grey fuzzy patch. To be able to see the Owl eyes you'll need a larger telescope but if you have one you'll immediately see why it's called the Owl Nebula. To find M97, find the plough again and look for the bottom right hand corner star, Merak. M97 lies about 2.5 degrees southeast of Merak. Perhaps this is another one for us up at the observatory? If you look hard and pay attention you may be able to view a bonus here as right next to M97 is M108, a cigar galaxy.

10. Pleiades (M45). As we move into autumn we start saying hello to some of my favourite constellations and objects in the sky. M45, the Pleiades, or the Seven Sisters is one of these objects. The Pleiades is an open cluster that many of you might already know by sight. Found in the constellation of Taurus (one of my afore mentioned favourites) the Seven brightest stars are visible in all but the most light- polluted skies. To find the cluster it is easiest to find the constellation of Orion, almost everyone can find the distinctive three stars of Orion's belt once they have been shown them once or twice. Above Orion's belt is a bright red star, Betelgeuse. Moving diagonally across the sky in a north-westerly direction from Betelgeuse is another bright red star, Aldebaran in Taurus, keep moving in the same direction for about the same distance and you will find our stars. M45 is pretty with the naked eye and it's a good test of your sky and your eyesight to see how many of the Severn Sisters you can see. (apparently in the darkest of skies and the best of eyesight it's possible to see 18, but I've never managed more than 6) but through a pair of binoculars it really is a lovely cluster to observe. I could really spend ages gazing at this cluster. If you choose to use a telescope you may be able to see a little of the nebulosity around the stars but this one is best viewed with binoculars.

11. M34. M34 is a very pretty star cluster visible to us from early autumn. It's buried in the Milky Way so be careful when you're looking for it that you're not just gazing at the milky way. M34 is in Perseus, half way between the Pleiades and Cassiopeia. It's relatively easy to find and can be observed in binoculars or a telescope at low power. To find M34, continue the line we took from Aldebaran to the Pleiades towards Cassiopeia. You will see three quite bright stars which form a right-angled triangle, Mirfak, Algol and Almach. M34 is right in the middle of this triangle, but like I said, be careful that you're not actually cooing at the beautiful Milky Way. M34 has a distinctive bright orange star to the southeast of the cluster.

12. **The Triangulum Galaxy (M33).** In dark skies M33 is a lovely galaxy to observe. It is even possible to see the spiral arms if you get a good night and a relatively well sized aperture. It is possible to view in binoculars but if you want any chance of the detail it needs to be a telescope. It's not the easiest object to find, a bit more of a challenge than the Andromeda Galaxy in last year's chairman's challenge but it's worth the effort. The easiest way to find M33 is to find the Great Square of Pegasus, (the main body of Pegasus the horse and the area of the sky that has very little in it – at least very little visible to the naked eye). From the northeast corner of the Great Square. From that corner there are four bright stars in a long line that stretch across the sky below Cassiopeia. The middle two of these stars are Almach (we've used that before) and Mirach. Down and to the left of these two stars you will find the the three slightly dimmer stars which make the constellation of

Triangulum. The pointer star of this little triangle (the brightest of the three) is the best marker for M33. The galaxy is northwest of this star, back towards Mirach but only a third of the distance. It may take some patience to find it but it's worth it. In Binoculars or a low power eye piece it will be just a vague fuzzy patch. Find it and then see if you can spot the the spiral arms using a higher magnification.

13. The last deep sky objects on the list are 3 double stars. In our search for M33 above we came across Pegasus and the well known Great Square of Pegasus. Three of the corner stars of the Great Square are double stars, the top left and right-hand stars and the bottom left. Have a go and see if you can split these doubles and make comparisons between colours and distances. I have to admit I haven't ever attempted to do this, only discovering that they were doubles while I was looking for stuff to add to this list, so I'm looking forward to trying this myself and to your reports of how you get on.

Lunar Observing

1. **Apennine Mountain Range.** The mountain range makes up the south wall of the Mare Imbrium (Sea of rains) and skirts the North West of Mare Serentatis, (Sea of Serenity). They are about 100km long and rise to a height of 5,400km, they consist of a number of other mountains such as Huygens, Huygens Delta and Hadley where Apollo 15 landed and used the moon rover. To observe this range a pair of decent binoculars or a telescope is needed, They are located in the North West quadrant and can be seen in the first Quarter, or 6 days after a full moon.

2. **Plato** A large crater found to the north of Mare Imbrium with some very interesting features. Located in the North West quadrant it should be a little more testing to find but again a decent pair of binoculars or telescope it should be easy enough. It can be seen on the 1st day after the 1st quarter or throughout the last quarter.

3. **Mare Nectaris (Sea of Nectar)** Another Binocular target Mare Nectaris is located below the Sea of Tranquillity but isn't quite so pronounced and so will need to be carefully identified. Sitting in the South East quadrant it is visible 5 days after new moon or 4 days after full.

4. **Theophilus.** Theophilus should be the easiest of the harder targets, this crater on the North Western ridge of Mare Nectaris has a central mountain 1,400km high, try and see it's 4 peaks. Visible 5days after new or 4 days after full.

5. **Kepler.** Kepler can be found by following the line of the Apennines down in a south westerly direction. Located in the North Western quadrant on the Eastern edge of Oceanus Procellarum It is a small crater but with distinct rays extending out and other small crater features both inside and around its walls. It can be seen 3 days after 1st quarter or 2 days after last quarter and you will need at least a small telescope to see it.

6. **Hercules & Atlas.** A pair of craters located in the North Eastern quadrant well to the North East of Mare Serentatis, with hills and craters inside and around them they should make a fascinating target.

They can be observed 6 days after a New moon or 5 days after the Full moon and a small telescope will be needed. If you can, Try to image some of these targets, you may be able to use a smart phone, a DSLR or a web cam and of course if you have one, a dedicated ccd camera.

Here ends the chairman's challenge 2018! Remember, other objects are available for your viewing pleasure and we really do want to know what you view. Come back in the autumn and tell us how you get on, did you manage everything on the list? Was it challenging? Was it worth the work? Did you take or draw any pictures? What would you like to see on next year's challenge?

I hope you all manage to observe at least one or two of these objects and most importantly have a wonderful time doing so. Clear skies until we return in September!