Introduction

Welcome to the ***Binocular Sky*** Newsletter of August 2013. The intention of this monthly offering is to highlight some of the binocular targets for the coming month. It is primarily targeted at observers in the UK, but should have some usefulness for observers anywhere north of Latitude 30°N and possibly even further south. For this Newsletter to be a useful tool, it needs to have the information that **YOU** want in it; therefore please do not be shy about making requests – if I can accommodate your wishes, I shall do so.

As the result of a request, from this month, I am including some variable stars with a maximum of mag +8.5 or brighter; I'm not normally a variable star observer, so comments will be welcome!

If you would like me to email this newsletter to you each month, please complete and submit the subscription form. You can get "between the newsletters" alerts, etc. via and .

Transient Objects

There are currently no transient objects or events suitable for small binocular users.

The Deep Sky *(Hyperlinks take you to charts and more information)*

As the sky darkens at twilight, in the North are NGC 457 (the Owl Cluster) and NGC 633 in Cassiopeia and the Perseus Double Cluster. More open Clusters are visible in the southern sky in the region of Ophiuchus. These include Melotte 186, NGC 6633 and M11, The Wild Duck Cluster, all of which are easily visible in 50mm binoculars. M11, which is a cluster of over a thousand stars, benefits enormously from larger apertures and the higher magnification that permits more stars, including the "V"-shaped grouping that gives it its common name, to be revealed. Even further to the south, culminating at around local midnight, is a group of open clusters in Serpens and Sagittarius that includes M16 (the *Eagle Nebula*), M17 (the *Swan* or *Omega Nebula*), M23, M24 (the *Sagittarius Star Cloud*), and M25.

Also worth enjoying in this region of sky is the denser part of the Milky Way that forms the *Scutum Star Cloud* as a backdrop to this cluster.

Open (also called 'Galactic') Clusters are loosely packed groups of stars that are gravitationally bound together; they may contain from a few dozen to a few thousand stars which recently formed in the galactic disk.

While you are in this region of sky, see if you can find Barnard's Star in Ophiuchus. This has the largest known proper motion of any star. (***Proper motion*** is motion with respect to the celestial sphere.) Although it is visible in 50mm binoculars from a dark site, it is considerably easier in larger glasses and I recommend a minimum of 70mm.

In August, we are able to look out of the plane of the Galaxy during the evening. This makes more globular clusters and galaxies available for observation. Very well placed this month are M81 (*Bode's Nebula*) and M82 (*The Cigar Galaxy)*, both of which are easy in a 50mm

binocular. These can be used as a good demonstration of averted vision: if you have them both I the same field of view, you may see that the core of M81 becomes more apparent if you look at M82. If you have good skies, try M51 (*The Whirlpool*) and M101 which, although it is a large object, is very difficult owing to its low surface brightness. The *Great Andromeda Galaxy*, M31, is also rising into the sky to a reasonable altitude this month. It is large and bright enough to be able to withstand quite a lot of light pollution although, obviously, it benefits from a dark transparent sky.

The two Hercules globulars, M92 and the very impressive, and very easy to find, M13 are at a very good altitude for observation. Although M13 is clearly larger than M92, it is easier to resolve the outer stars of the latter one. Also visible this month is M5 in Serpens, which is one of the largest globular clusters known, being 165 light years in diameter. Its apparent size is nearly as large as a Full Moon. At a reasonable altitude from the beginning of the month are the very bright M15, M2 (which looks almost stellar at 10x50) and NGC 6934. This last cluster is very easy to see and is excellent for demonstrating how globular clusters respond to transparency. In apertures of around 70mm and upwards, almost all of them look larger as the sky becomes more transparent. NGC 6934 displays to the greatest extent of any globular on which I have tested the phenomenon.

Globular clusters are tightly-bound, and hence approximately spherical, clusters of tens, or even hundreds, of thousands of stars that orbit in a halo around almost all large galaxies that have been observed. They are important for two reasons: Firstly, they contain some of the oldest stars in the galaxy, so studying them helps us understand the evolution of stars. Secondly, they are useful as "standard candles" in establishing a distance scale of the Universe, based on the assumption that the brightest stars in any globular cluster will be approximately the same brightness and that the brightest globulars in a galaxy will be approximately the same brightness.

The Deep Sky (contd)

The easiest planetary nebula, M27, the Dumbbell Nebula – although I insist that it looks more like an apple core than a dumbbell! – is visible in the evening skies in even 30mm binoculars. At the other extreme, if you have binoculars of at least 100mm aperture, see if you can find and identify NGC 6572, a planetary nebula in Ophiuchus. Even in large glasses it looks stellar, but it has the distinction of being possibly the greenest object in the sky.

Planetary Nebulae are short-lived (a few tens of thousands of years) masses of gas and plasma that result from the death of some stars. They have nothing to do with planets, but get their name from the fact that, in early telescopes, they had the disc-like appearance of planets.

There are two other objects which, owing to their southerly declination, are best observed this month. They are the two bright emission nebulae, M20 (the *Trifid*) and the larger, brighter and easier M8 (the *Lagoon*). They are only about a degree and a half apart, so they will fit into the same field of view of even quite large binoculars.

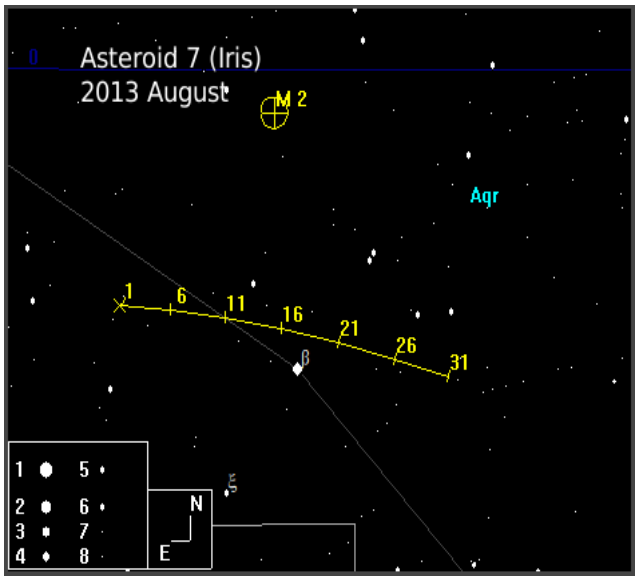
Variable Stars

Mira-type stars near predicted maximum (mag < +8.5)			
Star	**Mag Range**	**Period**	**Notes**
T Cas	7.9-11.9	445d	
R CrB	8.5-14.2	363d	Not behaving as predicted
S CrB	7.3-12.9	360d	
R Cyg	7.5-13.9	426d	
X Oph	6.8-8.8	329d	
R Ser	6.9-13.4	356d	

Variable Stars (contd)

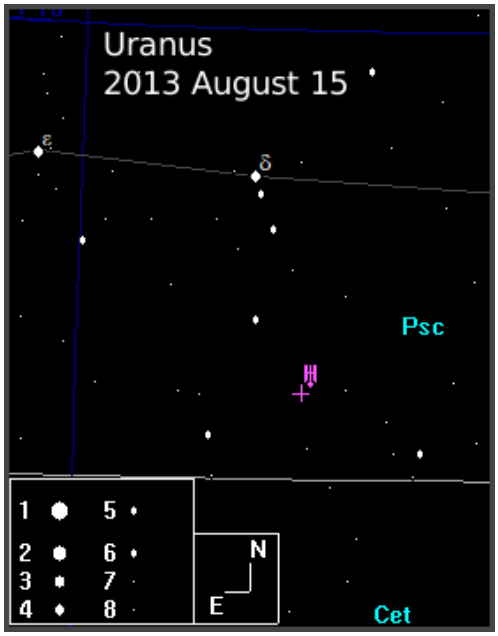
Selection of binocular variables (mag < +8.5)			
Star	**Mag Range**	**Period**	**Type**
U CrB	7.7-8.8	3d 10.9h	Eclipsing binary
RS Oph	4.3-11.8	Irreg	Recurrent nova
BF Oph	6.9-7.7	4.07d	Cepheid
XY Lyr	5.8-6.4	Irreg	
U Sgr	6.3-7.1	6.74d	Cepheid
R Sge	8.0-10.4	71d	RV Tauri
U Sge	6.5-9.3	3.38d	Eclipsing binary
U Vul	6.7-7.5	7.99d	Cepheid
SU Cyg	6.4-7.2	3.84d	Cepheid

The Solar System



Minor Planets

Asteroid 7 (Iris) passes between **M2** and ***Sadalsud*** **(β Aqr)** this month, brightening almost a magnitude from +8.3 as it does so.



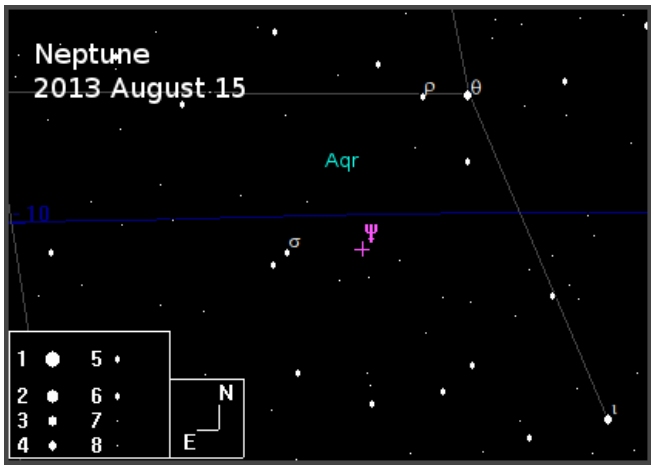
Planets

The binocular planets, **Uranus** and **Neptune**, are now available throughout the hours of darkness.

Uranus is at magnitude +5.8 and about 3.5° south of *δ Psc.* It moves less than a degree during the month.

Planets (contd)

Neptune is in the same field as σ *Aqr*, but is much fainter at magnitude +7.8, and its apparent motion is only about half as much.



Asteroid Occultations

There are no asteroid occultations of stars visible from the UK and suitable for binoculars this month.

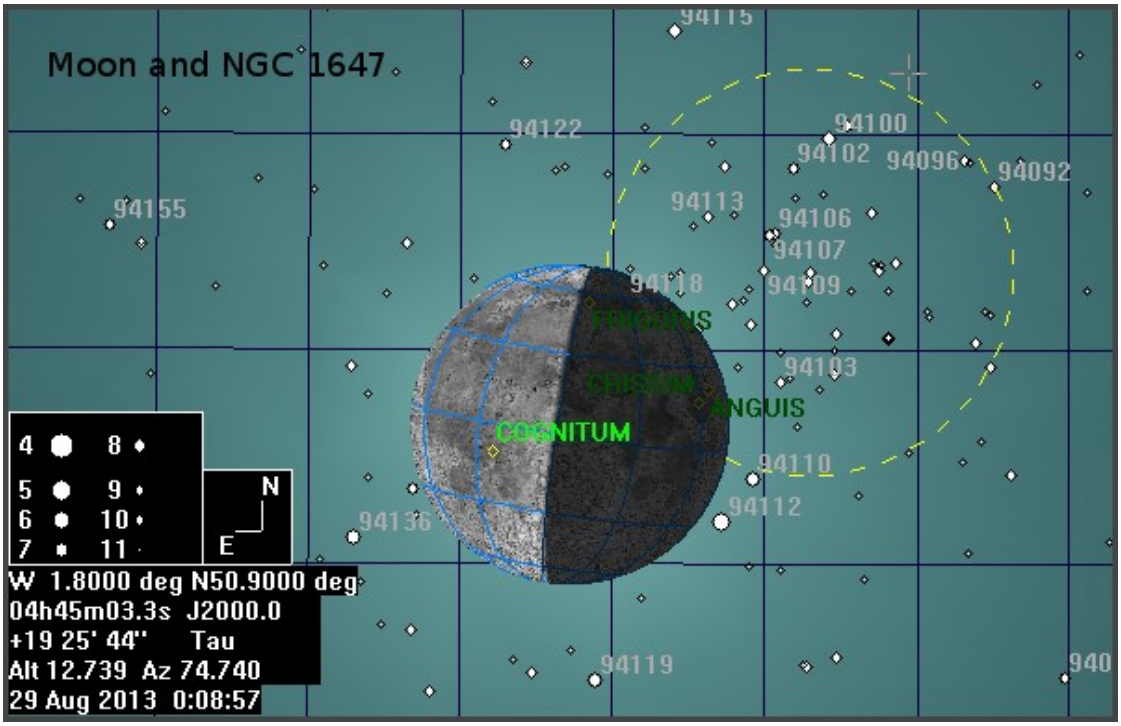
Lunar Occultations

There are several dark-limb occultations of stars brighter than mag +8.5 visible from the UK this month. Times and Position Angles are for my location (approx: 50.9N, 1.8W) and will vary by up to several minutes for other UK locations. The types are (**D**)isapearance, (**R**)eappearance and (**G**)raze. I have given the SAO numbers of stars on the assumption that most readers will find this more useful than ZC (Zodiac Catalogue) numbers. The graze of SAO 109282 on Aug 24 will be visible from parts of the southern UK (the graze line runs from E1.67° N52.71° to W2.59° N50.62°), and will be difficult owing to the graze being on the northern sliver of dark limb, very close to the illuminated part of the Moon.

Lunar Occultations (contd)

Date	Time	Const	SAO	Mag	Type	PA (°)
Aug 03	02:48:29	Ori	95031	7.9	R	295
Aug 03	03:00:55	Ori	95049	8.1	R	230
Aug 17	21:09:08	Sgr	161803	6.3	D	88
Aug 17	22:48:41	Sgr	161842	6.9	D	10
Aug 17	23:25:48	Sgr	161871	6.8	D	17
Aug 18	20:51:10	Sgr	162980	6.9	D	56
Aug 18	21:06:03	Sgr	162989	7.2	D	61
Aug 18	23:35:52	Sgr	163066	7.7	D	92
Aug 24	01:44:53	Psc	109282	7.6	G	334
Aug 26	02:44:41	Ari	92879	7.8	R	251
Aug 27	00:07:45	Ari	93260	6.4	R	263
Aug 27	23:57:04	Tau	93676	7.9	R	226
Aug 28	03:01:02	Tau	93721	5.9	R	287
Aug 29	00:03:24	Tau	94110	7.5	R	252
Aug 29	00:04:44	Tau	94112	6	R	234
Aug 29	00:58:44	Tau	94136	6.9	R	197
Aug 29	02:30:29	Tau	94164	5.1	R	212
Aug 30	02:13:49	Tau	94767	8.2	R	342
Aug 30	02:53:19	Tau	94787	7.3	R	232
Aug 30	03:05:27	Tau	94793	6.7	R	228
Aug 31	02:54:04	Gem	95808	8.5	R	235

The multiple events on the 29th involve stars in and around NGC 1647:



Meteor Showers

The **Perseids** have already started and will continue until late August. The peak is expected to be before the end of twilight on the 12th, but it should be worth observing from the end of nautical twilight (approx 21:00 UT at the latitude of southern England). The waxing crescent Moon will have set 30 minutes later, so will not interfere. The radiant is circumpolar, so meteors shoould be observable throughout the hours of darkness. These meteors are particles of debris from the tail of Comet 109P/Swift-Tuttle. As these particles enter the atmosphere, they compress and heat the air in front of them. This heat causes the surface of the particle to ablate and ionise. Binoculars are useful for observing the persistence of these ionisation trains that form the streak in the sky which is what we observe as a "shooting star".

The Moon

Aug 06 New Moon

Aug 14 First Quarter

Aug 21 Full Moon

Aug 28 Last Quarter

Wishing you Clear Dark Skies,

***Steve Tonkin for* The Binocular Sky**

Acknowledgments:

Charts prepared with Guide v9.0 from http://projectpluto.com

Occultation data produced with David Herald's Occult v4.1.0

Variable star data from David Levy's *Observing Variable Stars*