The Binocular Sky Newsletter

July 2015

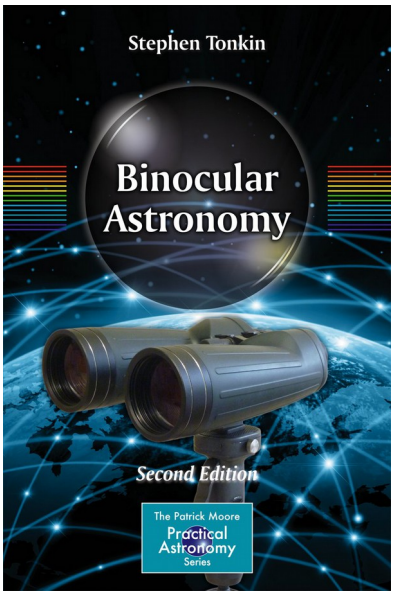
Introduction

Welcome to the **Binocular Sky** Newsletter of July 2015. 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.

Solar-system charts are clickable and will take you to a (usually) larger chart that may be more useful as well as being downloadable to your computer or smartphone.

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 .

If you would like to support this Newsletter, the simplest way is to purchase my book, Binocular Astronomy. Click on the image for more information.



The Deep Sky

Visible low 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 rises. These include Melotte 186, NGC 6633 and IC 4665, all of which are easily visible in 50mm binoculars. IC 4665 benefits enormously from larger apertures and the higher magnification that permits more stars to be revealed. You should seek out a particularly attractive curved chain of bright white stars that forms part of the greeting "Hi!" written in the sky. 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. A little to the northeast, in Scutum, is M11 (the Wild Duck Cluster). You need at least a 15x70mm binocular to resolve the vee-shape of brighter stars that gives this cluster of a thousand or so stars its common name. 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 July, 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 M3, 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. It's apparent size is nearly as large as a Full Moon. At a reasonable altitude by mid-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 easiest planetary nebula, M27 (the Dumbell Nebula – although I insist that it looks more like an apple core than a dumbell!) is now 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.

For interactive maps of Deep Sky Objects visible from 51°N, please visit: http://binocularsky.com/map_select.php

Binocular Double Stars for July

Star	Magnitudes	Spectral Types	Separation (arcsec)
67 Oph	4.0, 8.1	B5, A	54
ρ Oph	5.0, 7.3, 7.5	B5, A, B3	151, 157
53 Oph	5.7, 7.4	A2, F	41
δ Cep	4.1, 6.1	F5, A0	41
γ Her	3.7, 9.4	F0, K	43
δ Boo	3.5, 7.8	K0, G0	105
μ Boo	4.3, 7	F0, K0	109
ι Boo	4.0, 8.1	A5, A2	38
ν Boo	5.0, 5.0	K5, A2	628
DN & 65 UMa	6.7, 7.0,	A3, B9	63
π-1 Umi	6.6, 7.2	G5, G5	31

Mira-type stars near predicted maximum (mag < +7.5)		
Star	**Mag Range**	**Period (days)**
UV Aur	7.4-10.6	394
chi Cyg	5.2-13.4	408
R Ser	6.9-13.4	526

Selection of Binocular Variables (mag < +7.5)			
Star	**Mag Range**	**Period**	**Type**
U Cep	6.8-9.2	2.5d (increasing)	Eclipsing binary
V1010 Oph	6.1-7	0.66d	Eclipsing binary
RR Lyr	7.1-8.1	0.57d	RR Lyr
TX UMa	7.0-8.8	3.06d	Eclipsing binary
ZZ Boo	6.7-7.4	4.99d	Eclipsing binary
U Sge	6.5-9.3	3.38d	Eclipsing binary
U Vul	6.7-7.5	7.99d	Cepheid
X Cyg	5.9-6.9	16.39d	Cepheid
SU Cyg	6.4-7.2	3.84d	Cepheid
AF Cyg	6.4-8.4	92.5	Semi-regular

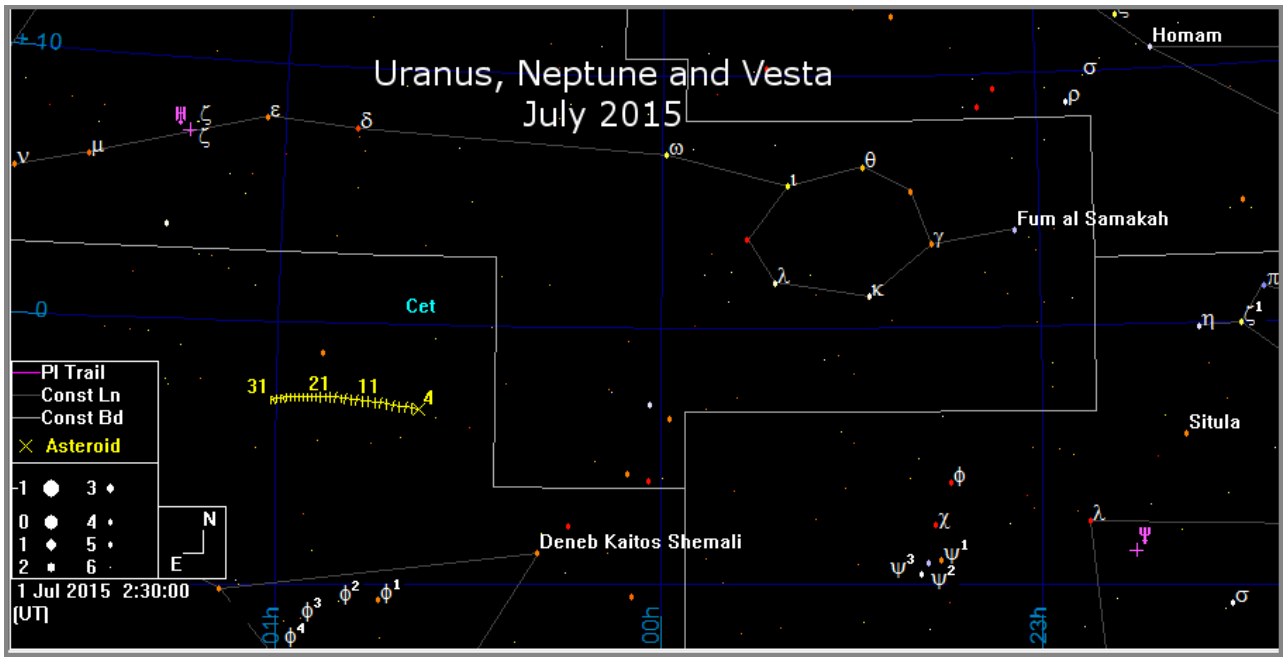
The Solar System

Minor Planets

Asteroid 4 (Vesta) (mag. +7.1) makes a welcome, if tricky (owing to twilight) return to visibility this month. It is in the same part of the sky as **Uranus** and **Neptune**.

Planets

The binocular planets, **Uranus** and **Neptune**, are becoming easier to observe in the morning sky. **Uranus** is at magnitude +5.8 and just next to *ζ Psc.* It moves only about 15 arcminutes during the month.



Neptune lies between λ and σ *Aqr*, but is much fainter than Uranus at magnitude +7.9, but its apparent motion is twice as much as Uranus's, in the direction of σ .

Comets

Comet C/2014 Q2 (Lovejoy) has faded to about mag. +9 and is now too difficult for small and medium binoculars in the light northern summer sky. The other bright comet, **Comet C/2014 Q1 (PanSTARRS)** is too low to be observed from our latitudes.

Asteroid Occultations

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

Lunar Occultations

There are only two occultations of stars brighter than mag +7.5 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**)isappearance,

(**R**)eappearance and (**Gr**)raze; they are all dark-limb events unless there is a **(B)**.

Lunar Occultations, Jul 2015, 50.9°N, 1.8°W					
Date	**Time**	**Type**	**SAO**	**Mag**	**PA (°)**
Jul 11	02:57	R	SAO 93276	5.6	297
Jul 25	21:20	D	o Lib	6.1	154

The Moon

Jul 02 Full Moon

Jul 08 Last Quarter

Jul 16 New Moon

Jul 24 First Quarter

Jul 31 Full Moon

Binocular Astronomy Talk

I will be giving a talk on Binocular Astronomy at Stratford-upon-Avon Astronomical Society at 7:30pm on July 21st. If any of the readers of this newsletter attends, please do introduce yourself!

Wishing you Clear Dark Skies,

Steve Tonki ***for*** **The Binocular Sky**

Acknowledgments:

The charts in this newsletter were prepared with Guide v9.0 from http://projectpluto.com

Variable star data based on David Levy's *Observing Variable Stars*

Occultation data derived with Dave Herald's *Occult*