The Binocular Sky Newsletter

September 2014

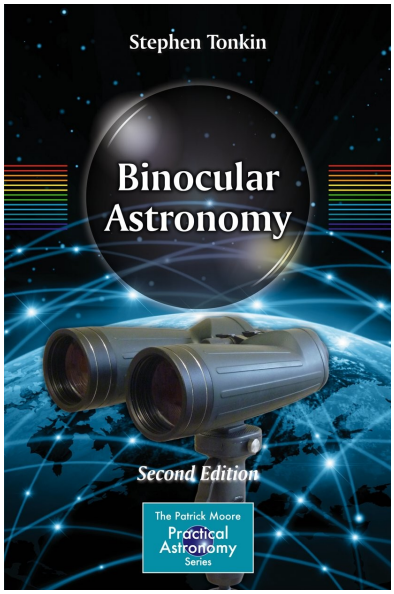
Introduction

Welcome to the ***Binocular Sky*** Newsletter of September 2014. 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.

NEW THIS MONTH: 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. Please click on the image for more information.



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 663 in Cassiopeia and the Perseus Double Cluster. To the East of them lie M34 in Perseus and the often-overlooked NGC 752 in Andromeda. 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. Even further to the south-west 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. Given the usual brightness of UK skies near the horizon, September is probably the latest you can realistically expect to see it in binoculars.

In September, 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 same can be said of M33 (*The Pinwheel*), which is considerably easier at the end of the month than it is at the beginning. Because they are of such low surface-brightness, they benefit from low magnification. This generally makes them easier to see in, say, a 10x50 binocular than in many "starter" telescopes. The *Great Andromeda Galaxy*, M31, is easily visible this month. It is large and bright enough to be able to withstand quite a lot of light pollution (making it available to urban observers) 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. Its apparent size is nearly as large as a Full Moon. At a reasonable altitude throughout 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 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. In Aquarius, you should be able to find the magnitude +8.0 NGC 7009, the *Saturn Nebula.* September is probably the earliest in the year that the *Helix Nebula,* NGC 7393 is observable in Britain before midnight.

Planetary Nebulae are short-lived (generally 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.

The two bright emission nebulae, M20 (the *Trifid*) and the larger, brighter and easier M8 (the *Lagoon*) are now sinking into the twilight; you will need a good south-western horizon if you are to have a realistic chance of observing them. 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 < +7.5)		
Star	**Mag Range**	**Period (days)**
R Cyg	7.5-14.0	426
S CrB	7.3-12.9	360
V CrB	7.4-11.0	358

Selection of Binocular Variables (mag < +7.5)			
Star	**Mag Range**	**Period**	**Type**
U Cep	6.8-9.2	2.5d (increasing)	Eclipsing binary
AR Cep	7.0-7.9	116	Semi-regular
RX Cep	7.2-8.2	55	Semi-regular
TX Psc	4.8-5.2	-	Irregular
RR Lyr	7.06-8.12	0.57d	RR Lyr
TX UMa	7.0-8.8	3.06d	Eclipsing binary
R Sge	8.0-10.4	71d, 1112 d	RV Tau
U Sge	6.5-9.3	3.38d	Eclipsing binary
DY Vul	8.4-9.7	–	Irregular
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
TW Peg	7.0-9.2	90, 956	Semi-regular

Double Stars

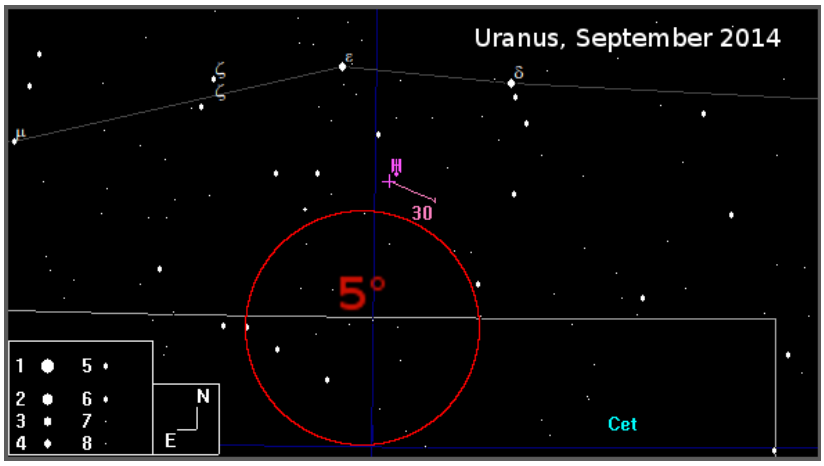
Binocular Double Stars for September			
Star	**Magnitudes**	**Spectral Types**	**Separation (arcsec)**
ζ Lyr	4.3, 5.6	A3, A3	44
β Lyr	3.6, 6.7	B8, B3	46
OΣ525 Lyr	6.0, 7.6	G0, A0	45
δ Cep	4.1, 6.1	F5, A0	41
γ Her	3.7, 9.4	F0, K	43
Σ2277 Her	6,2, 8.9	A0, K	27
8 Lac	5.7, 6.3	B3, B5	22
56 And	5.7, 5.9	K0, K2	128
ΣI 1 And	7.1, 7.3	G5, G5	47
ψ-1 Psc	5.3, 5.8	A2, A0	30
π-1 Umi	6.6, 7.2	G5, G5	31

The Solar System

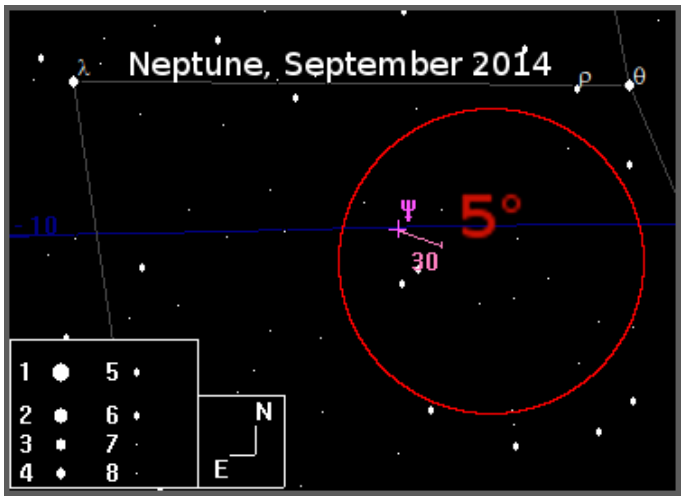
(The charts in this section are clickable)

Planets

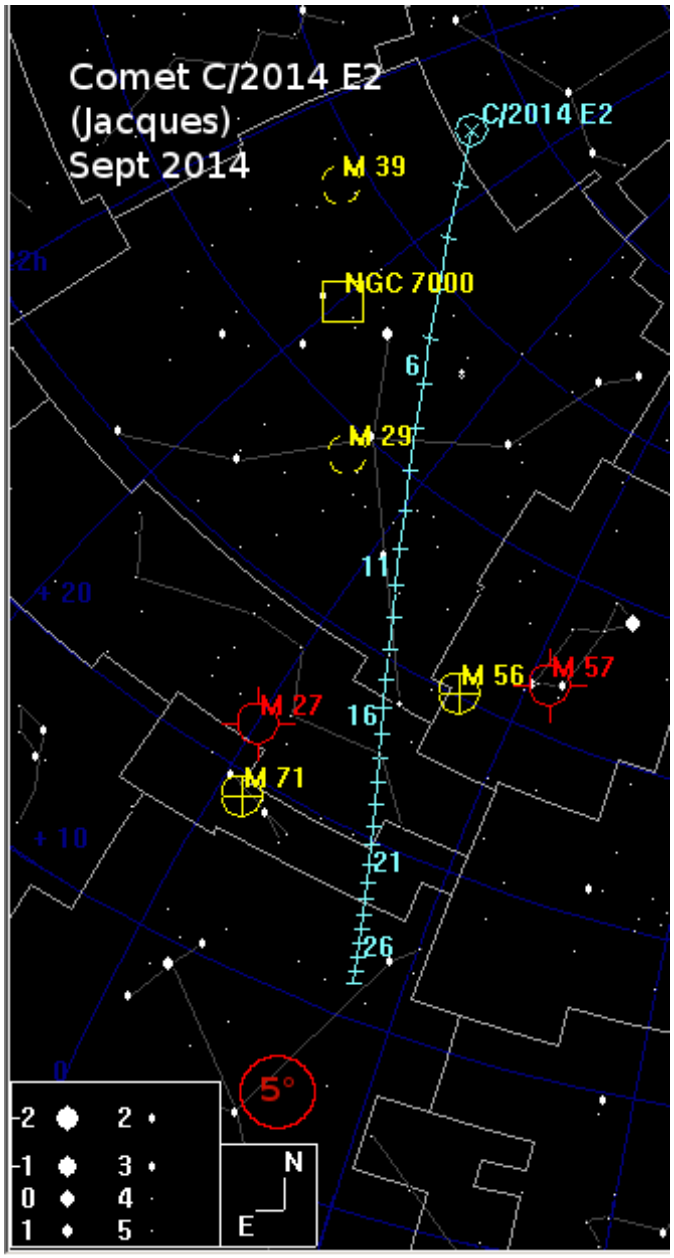
The binocular planets, **Uranus** and **Neptune**, are becoming easier to observe. **Uranus** becomes a late-evening object at magnitude +5.7 and just over 2° south of ε and δ *Psc.* It moves just over a degree during the month.



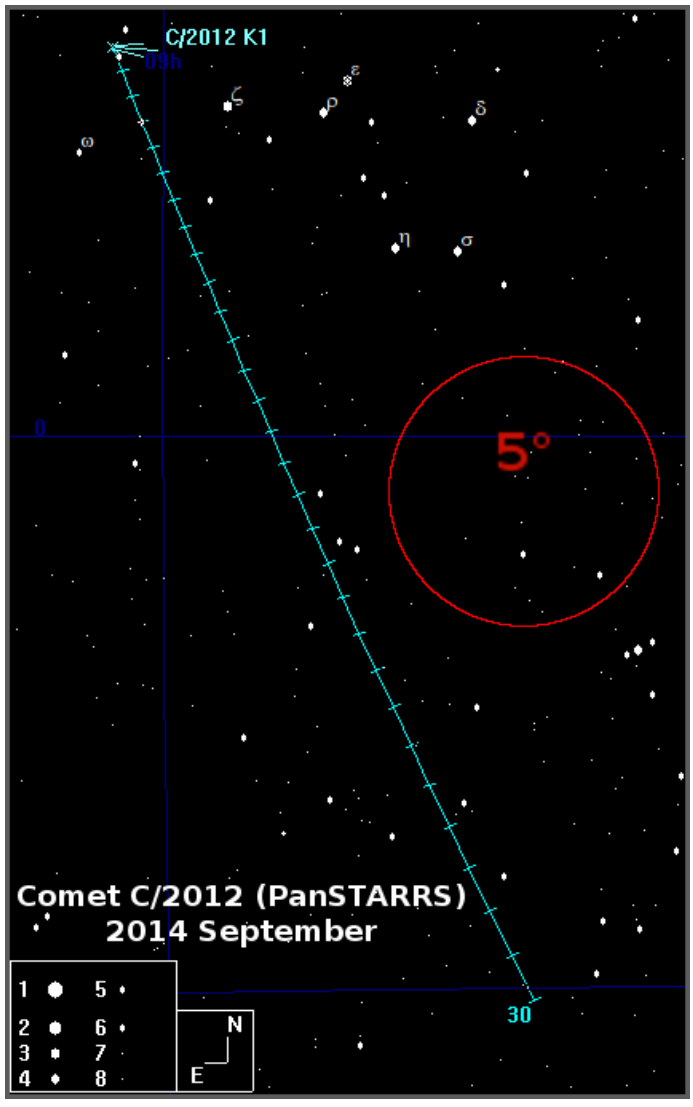
Neptune lies between λ and σ *Aqr*, but is much fainter than Uranus at magnitude +7.8. During the month, it moves about 45 arcminutes in the direction of σ. It is just past opposition, so may be observed from the early evening onwards.



Comets



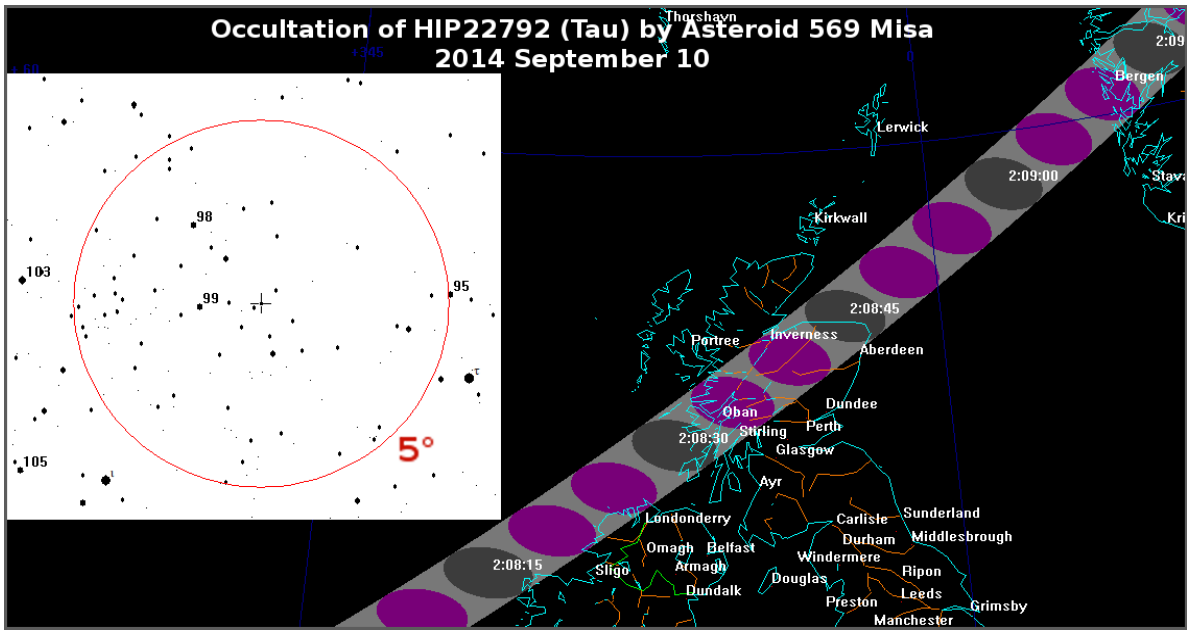
Comet C/2014 E2 (Jacques) is diving southward from Cepheus, through Cygnus, Vulpecula and Sagitta, into northern Aquila. It was approximately magnitude +7.5, but fading, when I observed it in late August. It will probably lose at least another two magnitudes during the month, so best to observe it before the Moon becomes too obtrusive as it may not be easily visible afterwards.

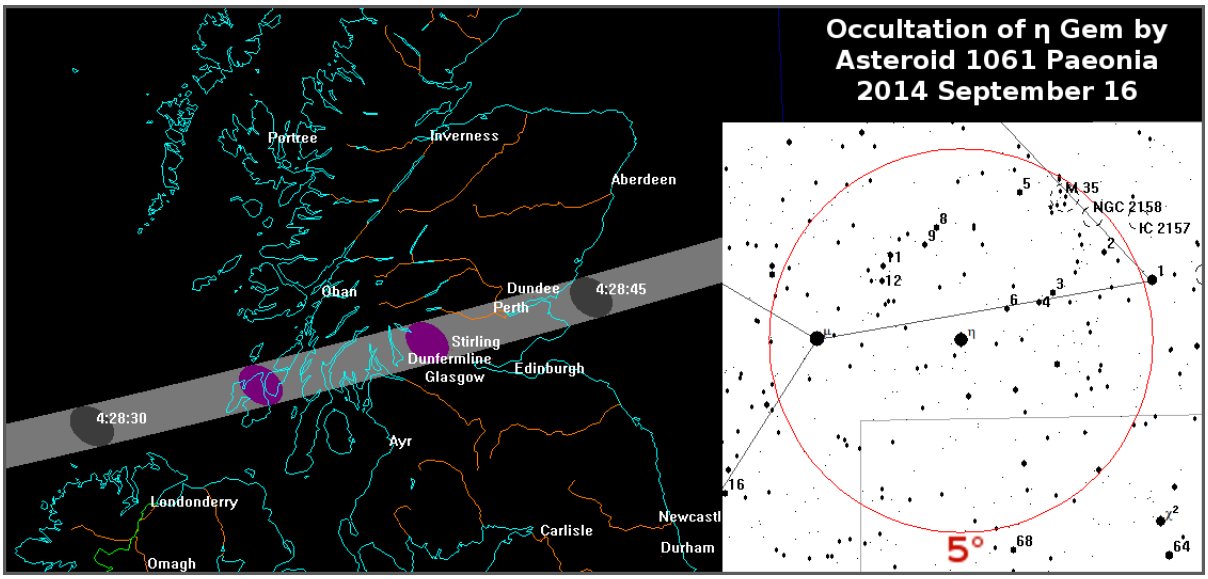


Comet C/2012 (PanSTARRS) is reported to be at magnitude +7.5 and is brightening. It should become binocular-visible early in the month in the morning skies as it passes through Hydra.

Asteroid Occultations

There are two binocular-accessible asteroid occultations visible from the British Isles this month, both visible from Scotland and one of them from Northern Ireland. The predicted times and tracks are shown on the charts on the next page, but do observe from at least 10 minutes before the predicted time and, if you don't see the occultation at the predicted time, 10 minutes afterwards as well. It may also be worth observing from locations near the predicted track, as both positive and negative reports are valuable.





Meteor Showers

There are no major meteor showers this month.

Lunar Occultations

There are several occultations of stars brighter than mag +7.5 visible from the UK this month, including the evening occultation of of o Psc on the 11th and the morning occultation of λ Gem on the 18th. On the 20th, the Moon rises towards the end of its occultation of M67. 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 and (**R**)eappearance. The occultations near the Full Moon on the 9th will be very difficult.

Lunar Occultations, Sep 2014, 50.9°N, 1.8°W					
Date	**Time**	**Type**	**SAO**	**Mag**	**PA (°)**
Sep 04	21:06:25	D	162001	6.6	129
Sep 04	22:47:50	D	162050	6.4	131
Sep 06	21:36:26	D	164025	7.5	149
Sep 06	22:10:51	D	164046	6.6	98
Sep 08	00:06:57	D	145833	7.4	81
Sep 11	21:44:26	R	110110	4.3	278
Sep 13	22:52:56	R	93524	6.4	275
Sep 15	00:05:33	R	94018	7.2	214
Sep 15	00:25:09	R	94019	6.7	266
Sep 15	23:58:01	R	94554	5.4	295
Sep 17	01:06:14	R	95572	6.3	300
Sep 17	01:51:31	R	95602	7.4	253
Sep 18	02:09:26	R	96652	7.3	288
Sep 18	04:27:37	R	96746	3.6	294
Sep 20	05:02:39	R	98235	5.4	214
Sep 21	04:08:04	R	117851	6.8	312
Sep 29	18:47:07	D	160018	7.0	87

The Moon

Sep 02 First Quarter

Sep 09 Full Moon

Sep 16 Last Quarter

Sep 24 New Moon

Wishing you Clear Dark Skies,

***Steve Tonkin 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*