



The Binocular Sky



September
2015

Newsletter

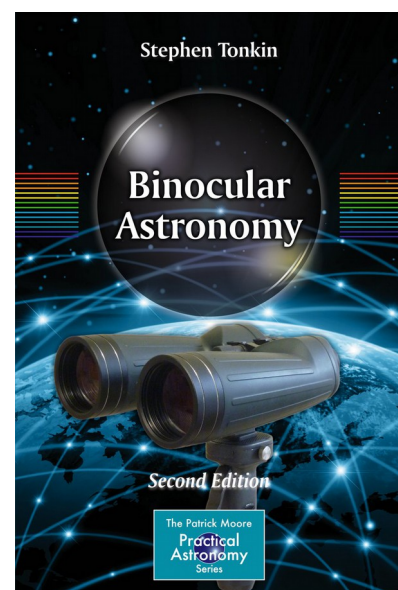
Introduction

Welcome to the **Binocular Sky** Newsletter of September 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, tablet or smartphone.

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The Deep Sky

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 in 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 Aql	6.1-11.5	284
S CrB	7.3-12.9	360

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
Σ11 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

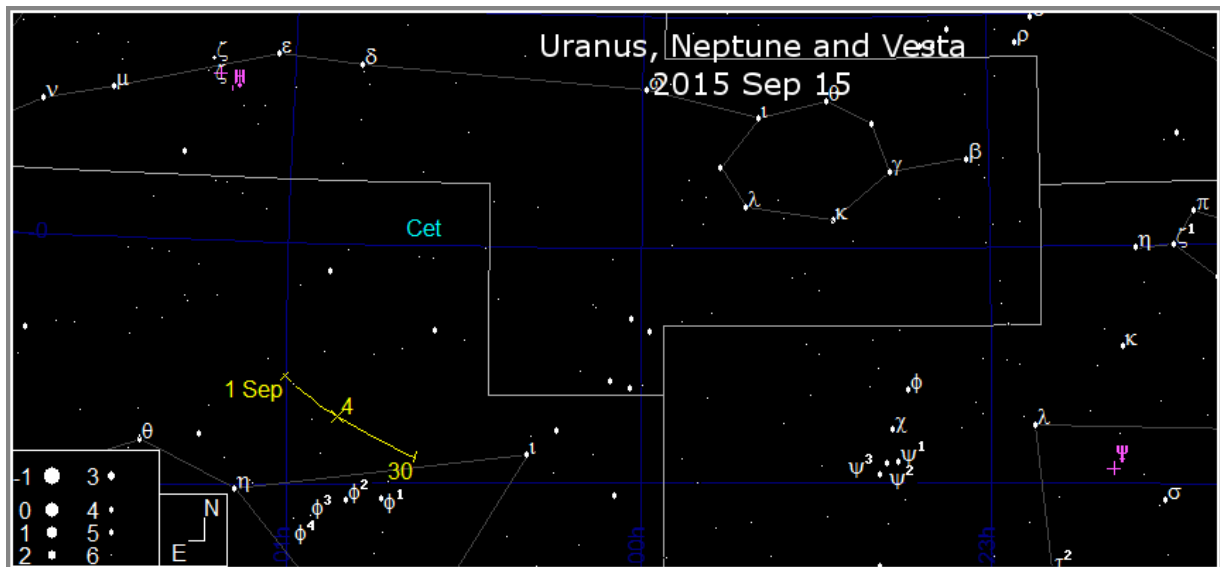
The Solar System

Minor Planets

Asteroid 4 (Vesta) (mag. +7.1, brightening to mag +6.6) is observable in Cetus. It is in the same part of the sky as **Uranus** and **Neptune**. **Asteroid 1 (Ceres)** is also available, but is low down in Sagittarius and very difficult from the UK as it fades half a magnitude from mag. +7.6.

Planets

The binocular planets, **Uranus** and **Neptune**, are becoming easier to observe, especially in the morning sky; by the end of the month, they are both above the horizon when evening twilight ends. **Uranus** is at magnitude +5.7 and just next to ζ Psc. It moves just under a degree to the southwest during the month.



Neptune lies between λ and σ Aqr, but is much fainter than Uranus at magnitude +7.8, but it moves just under a degree in the direction of σ during the month.

Comets

There are no bright comets visible from our location.

Meteor Showers

There are no major meteor showers this month.

Asteroid Occultations

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

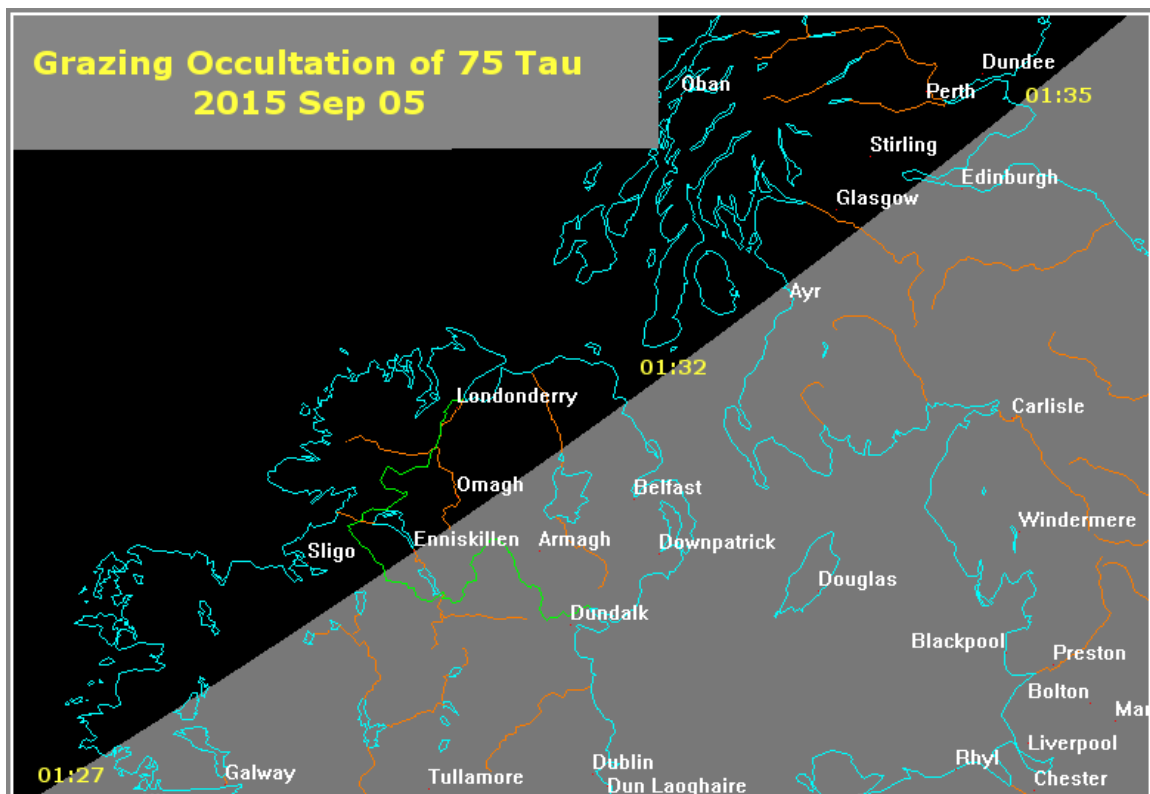
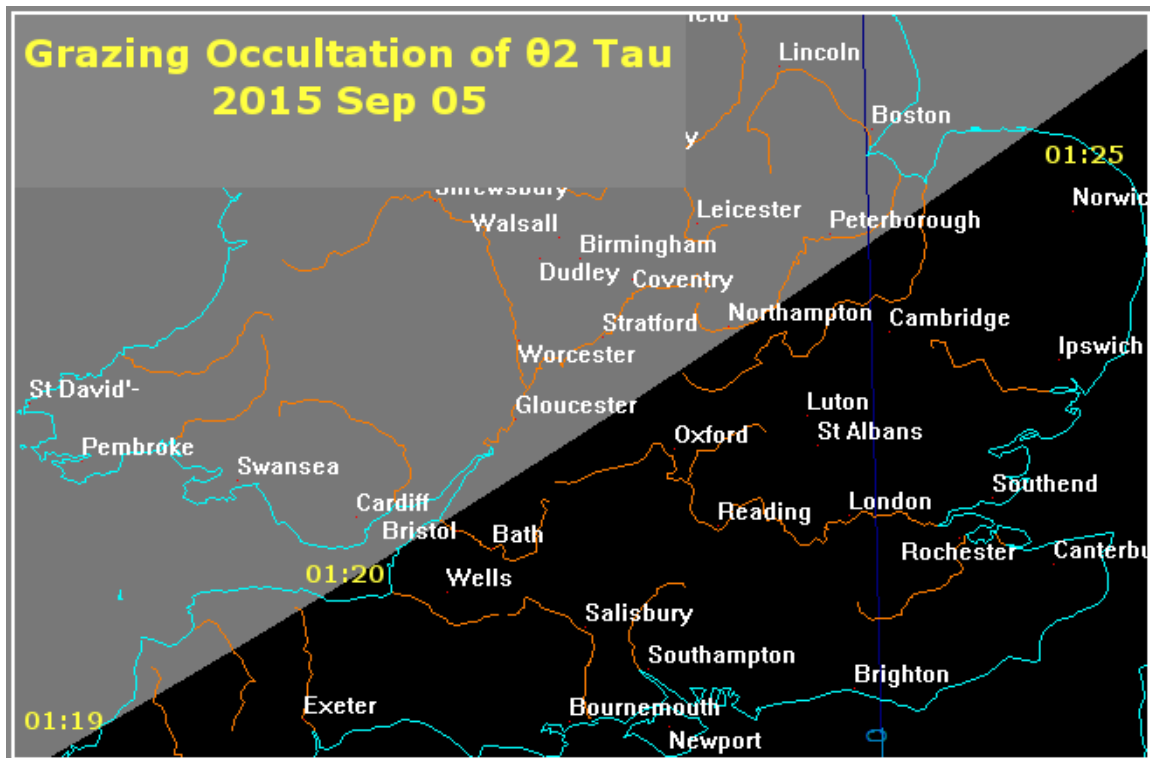
Lunar Occultations

There are several occultations of stars brighter than mag +7.5 visible from the UK this month, notably just after midnight on the 5th, when the last quarter Moon passes through the Hyades. 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)**aze; they are all dark-limb events unless there is a **(B)**.

Lunar Occultations, Sep 2015, 50.9°N, 1.8°W					
Date	Time	Type	Star	Mag	PA (°)
Sep 01	22:03	R	μ Psc	4.8	217
Sep 05	00:30	R	70 Tau	6.6	247
Sep 05	01:43	R	θ ¹ Tau	3.8	215
Sep 05	01:45	R	75 Tau	5.0	312
Sep 05	02:09	R	SAO 93961	6.7	294
Sep 05	02:57	R	SAO 93975	4.8	245
Sep 05	03:00	R	SAO 93981	6.5	233
Sep 05	04:39	R	SAO 94004	6.6	241
Sep 06	01:54	R	111 Tau	5.0	284
Sep 06	03:36	R	117 Tau	5.8	224
Sep 07	00:30	R	SAO 95473	6.4	214
Sep 07	01:49	R	SAO 95519	6.3	244
Sep 08	04:48	R	λ Gem	3.6	258

Both **75 Tau** and **θ² Tau** (mag +3.4), which is not occulted from my location, are grazing occultations from further north. The maps

below give approximate timings but observers should ascertain more precise conditions for their location.



The Moon

Sep 05 Last Quarter
Sep 13 New Moon
Sep 21 First Quarter
Sep 28 Full 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*

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