



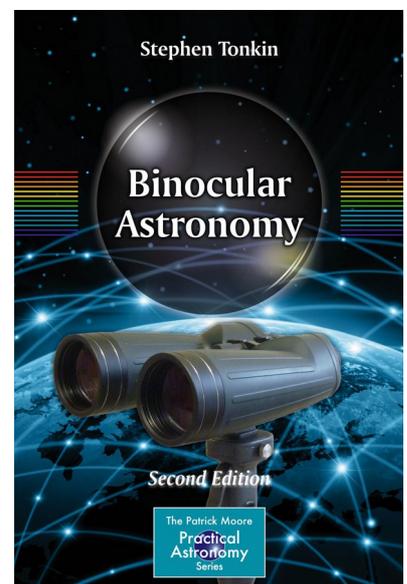
Introduction

Welcome to the ***Binocular Sky*** Newsletter of November 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.

Solar-system charts are now 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. Rising in the north-east is the trio of Auriga clusters, [M36](#), [M37](#) and [M38](#) and, later, [M35](#) in Gemini. While you are looking at M35, also see if you can identify two smaller open clusters, [NGC 2158](#), which is half a degree to the SE, and the slightly more difficult [IC 2157](#), which is a degree to the ESE. To the south of them, the Pleiades and Hyades are getting higher in the evening skies. Also look out for the nearby [NGC1647](#).

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.

In November, the Milky Way is overhead in the mid-to-late evening. This means that those objects (globular clusters and galaxies) that are outside our galaxy are not as well placed for observation as they are when the Milky Way is low in the sky. Although the bright [M81 \(Bode's Nebula\)](#) and [M82 \(The Cigar Galaxy\)](#), are still relatively easy to observe, even in a 50mm binocular, their altitude is such that you are unlikely to get neck-strain when you do so with straight-through binoculars. M81 and M82 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. [M51 \(The Whirlpool\)](#) and [M101](#) are becoming much more difficult owing to their lower altitudes; if you wish to see them this month, you should look as soon as the sky is dark.

Two notable exceptions to the generalisation of galaxies being poorly placed on November evenings are [The Great Andromeda Galaxy, M31](#) and [M33 \(The Pinwheel\)](#), both of which are close to the plane of the Milky Way. M31 in particular is very easily visible this month and is a naked eye object in moderately dark skies. It is large and bright enough to be able to withstand

quite a lot of light pollution (making it available to urban observers). M33 has a low surface-brightness and benefits from lower magnification. This generally makes it easier to see in, say, a 10x50 binocular than in many "starter" telescopes. It is in November evenings that the Sculptor Galaxy, NGC 253, becomes observable before midnight.

Galaxies are gravitationally bound "island universes" of hundreds of billions of stars at enormous distances. The light that we see from M31, for example, left that galaxy around the time our ancestors of the genus Homo were just evolving!

Although the two Hercules globulars, M92 and the very impressive, and very easy to find, M13 are still observable, but their altitude becomes less favourable as the month progresses. M15 and M2 are both better placed. This is also the best time of year to observe NGC 288 in the evening.

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. The Helix Nebula, NGC 7293 is becoming less easy to observe, and is another object that you need to attempt as early as possible in the evening.

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.

Variable Stars

Mira-type stars near predicted maximum (mag < +7.5)		
Star	Mag Range	Period (days)
V CrB	7.4-11.0	358

Selection of binocular variables (mag < +7.5)			
Star	Mag Range	Period	Type
XY Lyr	5.8-6.4	Irreg	Irregular
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
U Del	7.0-8.0	ca. 110d	Irregular
TW Peg	7.0-9.2	ca. 90d	Semi-regular
U Cep	6.8-9.2	2.5d (increasing)	Eclipsing binary

Double Stars

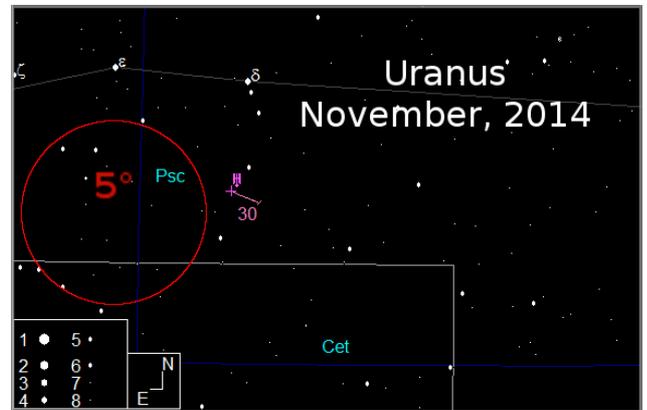
Binocular Double Stars for November			
Star	Magnitudes	Spectral Types	Separation (arcsec)
ζ Lyr	4.3, 5.6	A3, A3	44
β Lyr	3.6, 6.7	B8, B3	46
OΣ525 Lyr	6.0, 7.6	G0, A0	45
β Cyg	3.1, 4.7	K0, B9	35
δ Cep	4.1, 6.1	F5, A0	41
56 And	5.7, 5.9	K0, K2	128
Σ11 And	7.1, 7.3	G5, G5	47
ψ-1 Psc	5.3, 5.8	A2, A0	30
14 Ari	5.0, 7.9	F0, F2	106
62 Eri	5.4, 8.9	B9, B8	67
τ Tau	4.3, 7.0	B5, A0	63
ν Gem	4.1, 8.0	B5, A0	113
ζ Gem	4.0, 7.6	G0, G	101
p-1 Umi	6.6, 7.2	G5, G5	31

The Solar System

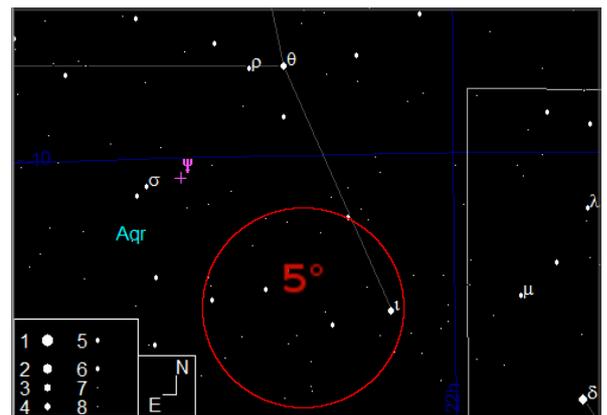
(The charts in this section are "clicky")

Planets

Of the binocular planets, **Uranus** is becoming easier to observe during the evening, shining at magnitude +5.7 and just over 2° south δPsc . It moves just under a degree during the month.



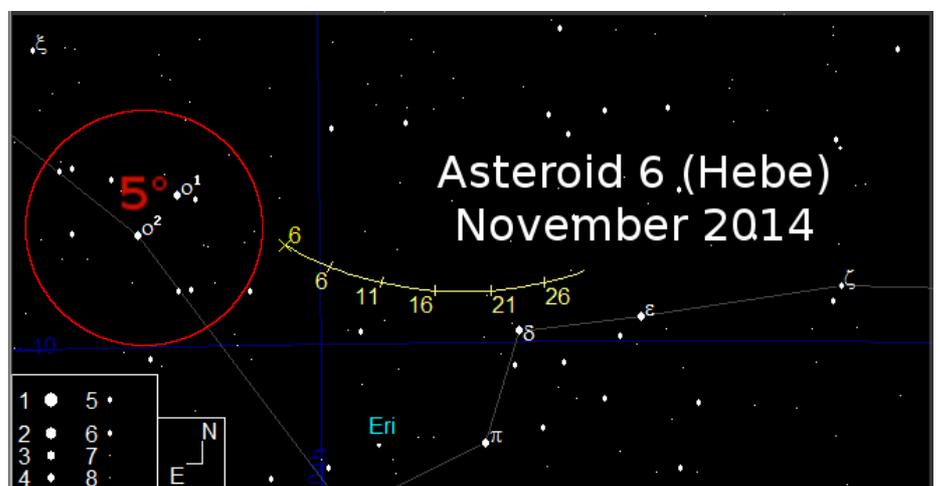
Neptune spends the month half a degree W of σAqr . It is much fainter than Uranus at magnitude +7.9, but is still an easy binocular target in the evening sky.



Asteroids

Asteroid 6 (Hebe)

moves along Eridanus, starting 2° WSW of αEri and ending the month close to δ and ϵEri . At mag 8.1, it is an easy object in 70mm binoculars. It is at opposition on the 16th.



The Moon

Nov 06 Full Moon

Nov 14 Last Quarter

Nov 22 New Moon

Nov 29 First Quarter

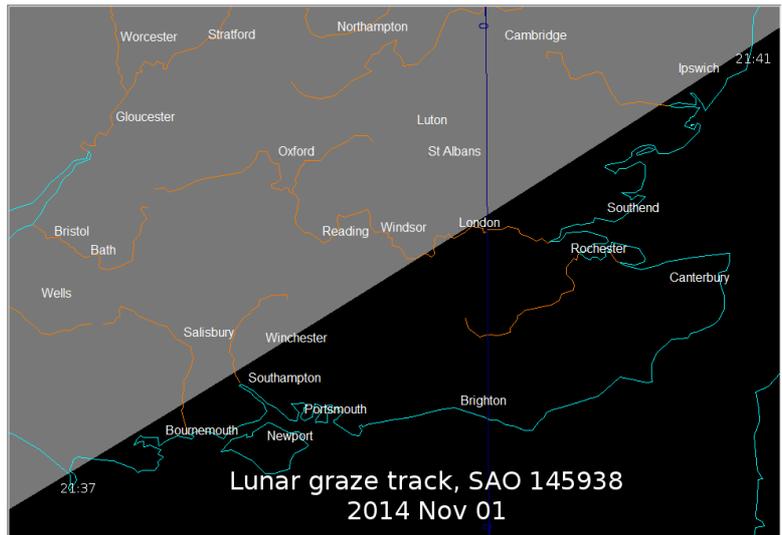
Lunar Occultations

There are several 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 (**G**)raze.

Lunar Occultations, Nov 2014, 50.9°N, 1.8°W					
Date	Time	Type	SAO	Mag	PA (°)
Nov 01	19:21:44	D	145905	7.0	113
Nov 01	21:37:59	G	145938	7.2	178
Nov 02	17:50:02	D	146456	7.5	68
Nov 03	00:46:00	D	146580	7.2	97
Nov 04	01:39:37	D	109048	7.5	109
Nov 05	17:04:49	D	o Psc	4.3	59
Nov 07	18:24:00	R	119236	6.4	291
Nov 10	04:49:20	R	94874	7.3	334
Nov 10	22:37:31	R	95771	7.3	244
Nov 11	00:58:51	R	95883	7.3	312
Nov 12	05:03:25	R	68 Gem	5.3	256
Nov 13	04:00:47	R	97761	7.3	233
Nov 15	02:17:30	R	117979	7.0	295
Nov 15	03:38:23	R	117997	6.8	237
Nov 18	06:34:57	R	138703	7.0	252
Nov 18	06:35:04	R	138704	6.6	253
Nov 25	17:16:53	D	162050	6.4	123
Nov 27	19:21:56	D	164046	6.6	108
Nov 27	21:15:27	D	164080	7.1	12
Nov 28	17:26:40	D	145718	7.2	72

The occultations near the Full Moon on the 6th will be very difficult.

Of particular interest this month is the graze of a double star, *SAO 145938*, on the 1st. The track runs from Portland (21:37) to Ipswich (21:41). There are three other grazes this month:
10th: *20 Gem*, visible only from Dungeness Point shortly after 22:36.



11th: *SAO 95833* on a track from Tiree (00:33) to just north of Aberdeen (00:38)

27th: *SAO 164025* on a track from Hartland Point (18:58) to just north of The Wash (19:02)

Also of note are the occultations of bright stars *o Psc (D)* on the 5th and *68 Gem (R)* on the 12th, and the double-star occultation (R) on the 18th.

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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