Introduction

Welcome, especially to new readers, to April's **Binocular Sky** Newsletter. The intention of this monthly offering is to highlight some of the binocular targets for the coming month. It is primarily targeted at binocular observers (although I know that many small-scope observers use it as well) in the UK, but should have some usefulness for observers anywhere north of Latitude 30°N and possibly even further south.

Most charts are "clicky" and will take you to a higher resolution chart.

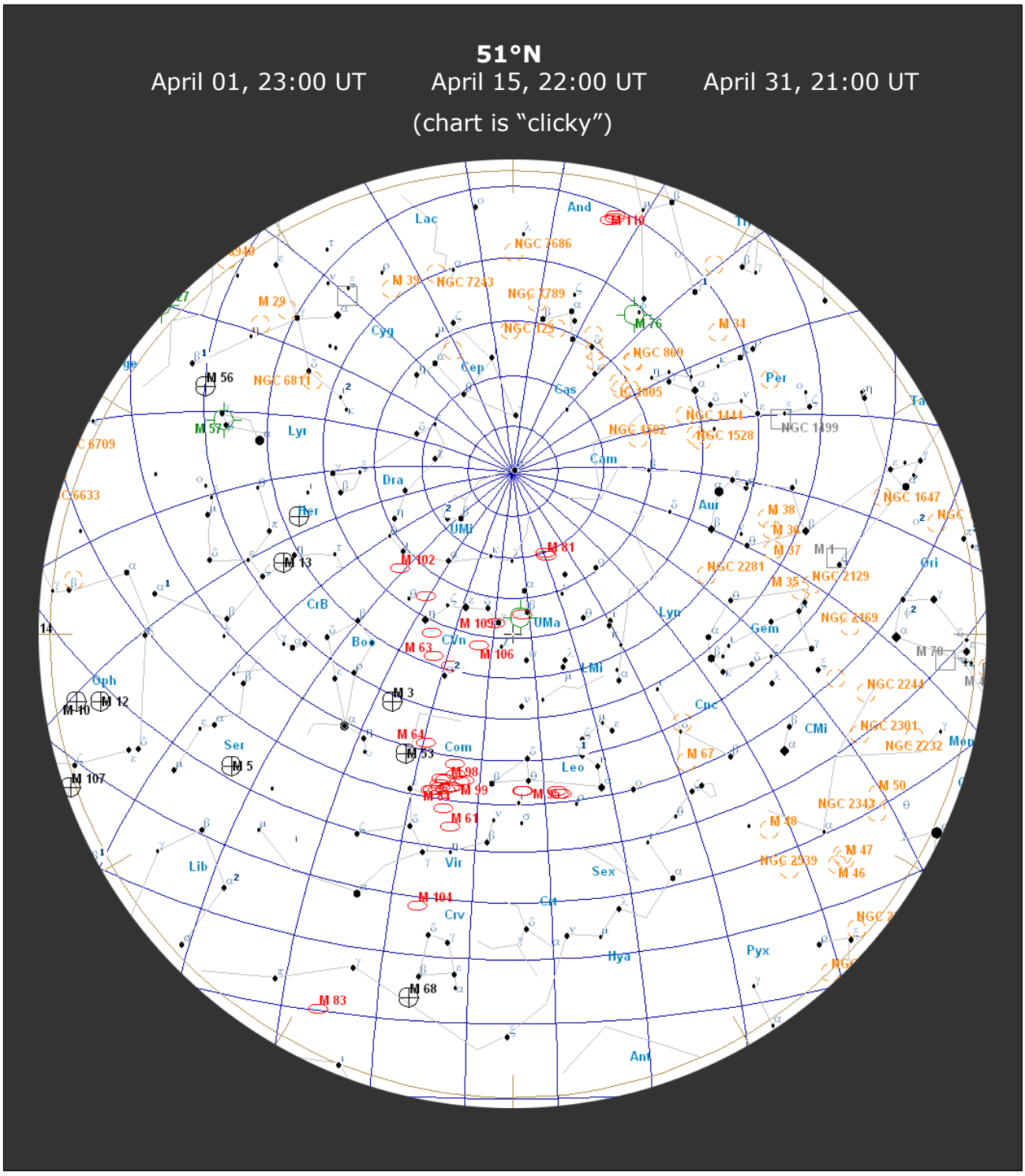
Highlights this month include three comets, a mini-review of the new Helios LightQuest-HR series of binoculars, and a grazing lunar occultation for south-western England and Eire.

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 .

The Deep Sky

(Hyperlinks will take you to finder charts and more information about the object.)

The *Pleiades* (M45) and the *Great Orion Nebula* (M42) culminate before Civil Twilight ends, but are still fine sights in binoculars early in the month, as are the trio of open clusters in Auriga and 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. Also high are M44 (*Praesepe*) and M67 , two fine open clusters in Cancer. Lower in the southern sky are more open



clusters M46 & M47 and, near Sirius, M41.

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 April, 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. Look out for the two galaxy trios in Leo (M95/96/105 and M65/66/NGC3628) and Markarian's Chain in Coma Berenices. If you have a big binocular, also observe the edge-on NGC4565 (*Berenice's Hair Clip*), which is next to Melotte 111, the cluster that gives Coma its name. You should find M81 (*Bode's Nebula*) and M82 (*The Cigar Galaxy*) 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), M94 and M63 (*The Sunflower*). M63 really needs a 70mm or larger binocular in anything other than pristine skies.

The globular cluster M3 is a good one to start with during an April evening's observing. Later in the evening, the two Hercules globulars, M92 and the very impressive, and very easy to find, M13 are at a better altitude for observation.

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.

If you have binoculars of 70mm aperture or (preferably) greater, see if you can find and identify *The Ghost of Jupiter (NGC 3242)*, a planetary nebula in Hydra. It is a difficult object because it is low in the sky, even from southern Britain.

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 appearance of giant planets.

For interactive maps of Deep Sky Objects visible from 51°N, please visit:

http://binocularsky.com/map_select.php

Variable Stars

Mira-type stars near predicted maximum (mag < +7.5)		
Star	**Mag Range**	**Period (days)**
X Oph	6.8 – 8.8	329
U Ori	6.3 – 12.0	368

Selection of binocular variables (mag < +7.5)			
Star	**Mag Range**	**Period**	**Type**
AA Cam	7.5-8.8	Irreg	Irregular
Y Lyn	7.2-7.8	110d	Semi-regular
U Cep	6.8-9.2	2.5d (increasing)	Eclipsing binary
X Cnc	5.6-7.6	165d	Semi-regular
R Cnc	7.1-8.6	90d	Semi-regular
TX UMa	7.0-8.8	3.06d	Eclipsing binary
R Vir	6.9-11.5	145d	Mira
ZZ Boo	6.7-7.4	4.99d	Eclipsing binary

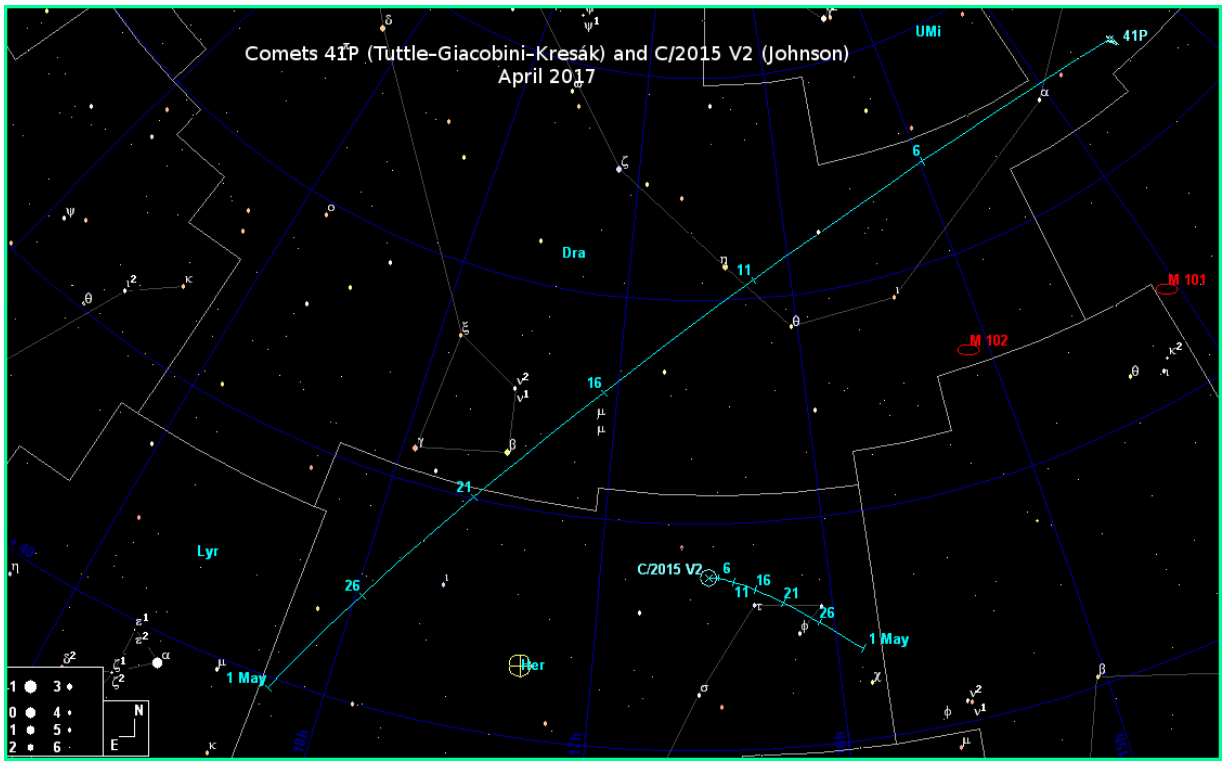
Double Stars

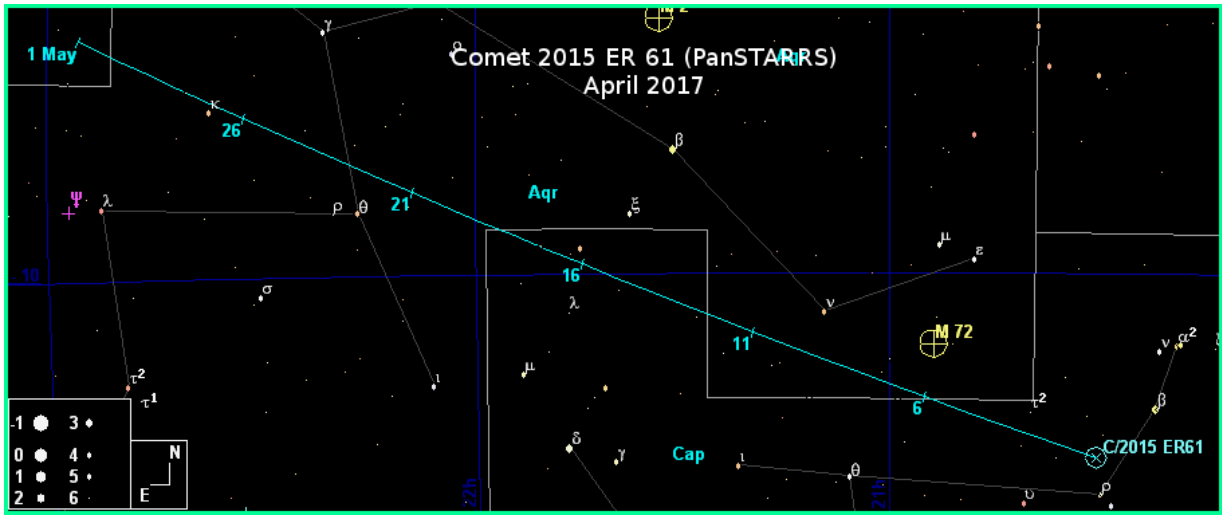
Binocular Double Stars for April			
Star	**Magnitudes**	**Spectral Types**	**Separation (arcsec)**
τ Leo	5.0, 7.4	K0, G5	89
δ Cep	4.1, 6.1	F5, A0	41
ι Cnc	4.0, 6.0	G5, A5	31
ν Boo	5.0, 5.0	K5, A2	628
DN & 65 UMa	6.7, 7.0	A3, B9	63
π-1 Umi	6.6, 7.2	G5, G5	31
ν Dra	4.9, 4.9	A5, A5	62
39 Dra	5.1, 7.9	A2, F8	89

The Solar System

Comets

Comet 41P (Tuttle–Giacobini–Kresák) was nominally of 7th magnitude when I last observed it in the last week of March. However, it is large and diffuse and was a difficult object under suburban skies in a good 10x50 binocular. It requires a dark transparent sky if you are to have any chance of success, although it may get easier as the month progresses. **C/2015 V2 (Johnson)** is expected to brighten, possibly even to mag. +6, during the month and come within the range of medium and small binoculars. **Comet 2015 ER 61 (PanSTARRS)** has brightened more than expected and is now around 9th magnitude; it too is expected to brighten further by at least a magnitude and perhaps more. All are best in the morning. (charts are clicky)





Asteroid Occultations

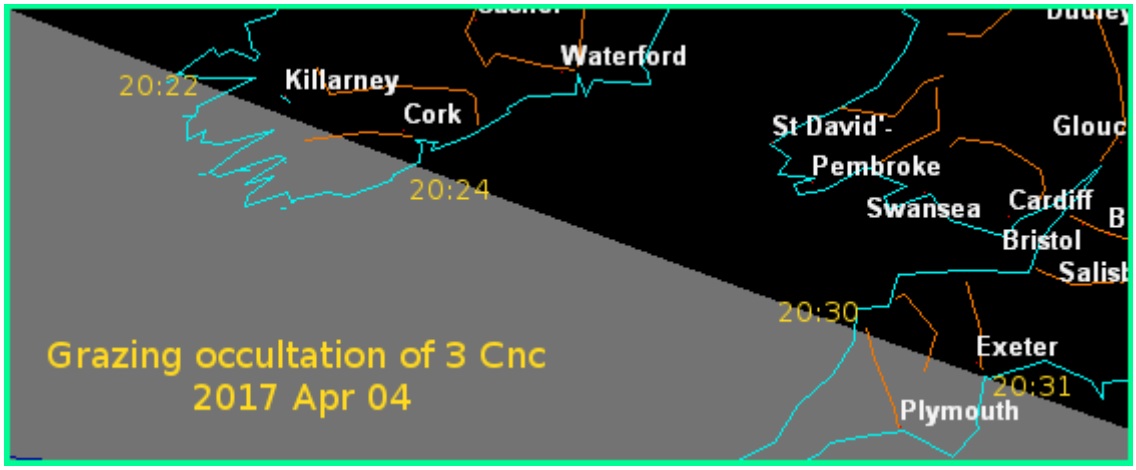
There are no predicted asteroid occultations of stars visible from the UK and suitable for binoculars (mag. < +7.5) this month.

Lunar Occultations

There are several occultations of stars brighter than mag +7.0 visible from the UK this month. Data are for my location and may vary by several minutes for other UK locations. The types are (**D**)isappearance, (**R**)eappearance and (**Gr**)raze; they are all dark-limb events unless followed by a (B). The highlight is the graze of 3 Cnc on the 4th.

Lunar Occultations, Apr 2017, 50.9°N, 1.8°W

Date	Time	Phase	Star	Spectrum	Magnitude	Cusp Angle	Position Angle
Apr 02	23:53:21	D	HIP 29326	K1	6.4	75S	106
Apr 04	20:36:38	Gr	3 Cnc	K3	5.6	1.5N	
Apr 06	20:02:55	D	HIP 48298	A0	6.9	83N	102
Apr 13	23:34:37	D (B)	γ Lib	K0	3.9	-85S	101
Apr 14	00:51:45	R	γ Lib	K0	3.9	67N	299
Apr 19	04:26:14	R	57 Sgr	K0	5.9	42S	211
Apr 30	21:33:09	D	HIP 32539	A2	6.4	28S	160



The Moon

April 03 First Quarter
April 11 Full Moon
April 19 Last Quarter
April 26 New Moon

Public Outreach & Talks

During April I will be at the following events, where I would be delighted to meet any readers of this newsletter who attend:

8th: *Solar Observing* (only if clear), 10:30am at the Bournemouth Natural Science Society Open Day.

18th: Talk: *Pseudoastronomy #2: Conspiracies, Charlatans and Frauds*, 7:30pm at Fordingbridge Astronomers .

Equipment Mini-Review

Helios LightQuest-HR range

Front-to back: **10x50, 16x70, 20x80, 25x100**

In January this year, I was invited by **The Binocular Shop** to review four members of the new **Helios LightQuest-HR** range of astronomical binoculars. The range includes **10x50**, 11x70, **16x70**, 16x80, **20x80**, 20x100 and **25x100**. I reviewed the ones in bold. All are individual-eyepiece focusing, fully multicoated binoculars of a Bausch&Lomb (aka "American") construction. The 100mm come in a foam-lined hard case; the others in a robust cordura case similar to those supplied with Steiner binoculars.

Manufacturer's Specifications

	10x50	16x70	20x80	25x100
Weight (g)	1320	1930	2490	3990
Field of View (°)	6.5	4.1	3.3	2.7
Eye Relief (mm)	20	20	16	16
IPD (mm)	56-64	56-64	56-64	56-64
Waterproof	Yes (IPX7)	Yes (IPX7)	Yes (IPX7)	Yes (IPX7)
Uk Guarantee	Not specified	Not specified	Not specified	Not specified
Prism Type	Porro	Porro	Porro	Porro
Origin	China	China	China	China
Body Material	Magnesium Alloy	Magnesium Alloy	Magnesium Alloy	Magnesium Alloy
Armour Type	Synthetic leatherette	Synthetic leatherette	Textured rubber	Textured rubber
Nitrogen Gas Filled	Yes	Yes	Yes	Yes
Prism Material	BaK4	BaK4	BaK4	BaK4
Prism Coating	Multi-coated	Multi-coated	Multi-coated	Multi-coated
Lens Coating	Fully multi-coated	Fully multi-coated	Fully multi-coated	Fully multi-coated
Eyecup Type	Fold Down	Fold Down	Fold Down	Fold Down
Price	£269	£420	£520	£629

Objectives. L-R: Lunt 70, LightQuest 70, LightQuest 80

The LightQuest is significantly longer than other 70mm binoculars, resulting in better quality images.

The 50mm and 70mm versions are superficially very similar to the *Lunt Magnesium* equivalents. I have been told that they are meant to have the same optics and coatings as the *Lunts*, but the coatings on the objectives of the *LightQuest-HR* binoculars were a different colour and I found stronger spurious reflections off the

prisms when the Moon or Venus were just below and to the side of the field of view, most noticeably in the 10x50s. Apart from that, I could detect only very subtle differences in the images given by the 10x50s of each range and the 16x70s were almost indistinguishable, with the *LightQuest-HR* giving a slightly better image of Jupiter and its moons.

The 16x70 is the same length as the 20x80, and hence longer than common 15x70 binoculars. I estimate the focal ration of the 16x70s to be approximately f/5; for all the others, this is approximately f/4. (I cannot establish this precisely without dismatling the binoculars.) The consequence is that the image quality in the 16x70 is noticeably better than in the others.

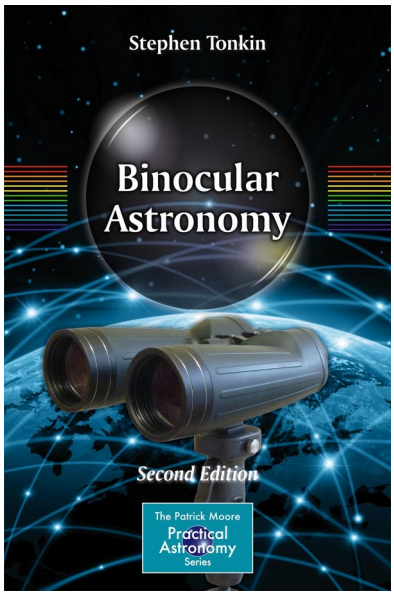
The eye-relief on the 50mm and 70mm models was easily sufficient for use with spectacles, but the 80 and 100mm models had less and, although it was just sufficient for me, it would be worth ascertaining if it is sufficient for you if you wear spectacles and are considering these. It may also be worth noting that the 16x80 and 20x100 models have more eye relief than the 20x80 and 25x100. The only other caveat I found is that the supplied tripod adaptor restricts the minimum IPD on the 50mm, 70mm and 80mm models (the 100mm has a substantial mounting bar and post)

All are very capable binoculars and I doubt any would be disappointing. Obviously, colour correction (compared to the 16x70) deteriorates in the 20x80 and 25x100 (nothing of these apertures is truly achromatic at f/4) but I still found them to be extremely enjoyable to use. In particular, I enjoyed the 16x70 for its excellent image quality and the 25x100 for the sheer joy of scanning the deep sky with a wider field than I normally use with my 100mm; I think these are both extremely good value for money.

There are detailed reviews of each on the **Binocular Sky Reviews** page.

The **Binocular Sky Newsletter** will always be free to anyone who wants it, but if you would like to support it, there are a number of options:

- Purchase my book, Binocular Astronomy: Click on the image for more information
- Make a purchase via the affiliate links in the Binocular Sky shopfront
- Make a small PayPal donation to newsletter@binocularsky.com



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 or Stellarium under GNU Public License, incorporating Milky Way panorama © Axel Mellinger

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

Occultation data derived with Dave Herald's *Occult*

Disclosure: Links to *Amazon* or *The Binocular Shop* may be affiliate links

---