The Binocular Sky Newsletter

No. 92
July 2019

Introduction

Welcome, especially to new readers, to July's **Binocular Sky** Newsletter. My intention in writing this monthly offering is to highlight some of the binocular targets for the coming month. It is primarily targeted at binocular observers (although many small telescope 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 (I have at least one subscriber as far south as 12°N).

Astronomical darkness, albeit short, return for locations south of about 53.5°N this month and, as binocular observers with our combination of maximum portability and minimal set-up time, we are well suited to take advantage of what this darkness reveals.

The binocular planets, Uranus and Neptune are becoming much easier to observe, but the short darkness means that there are only three suitable lunar occultations of stars, all dark-limb disappearances.

Our mini-review this month is of the *Manfrotto Magic Arm* (p 11).

If you would like to receive the newsletter automatically 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.)

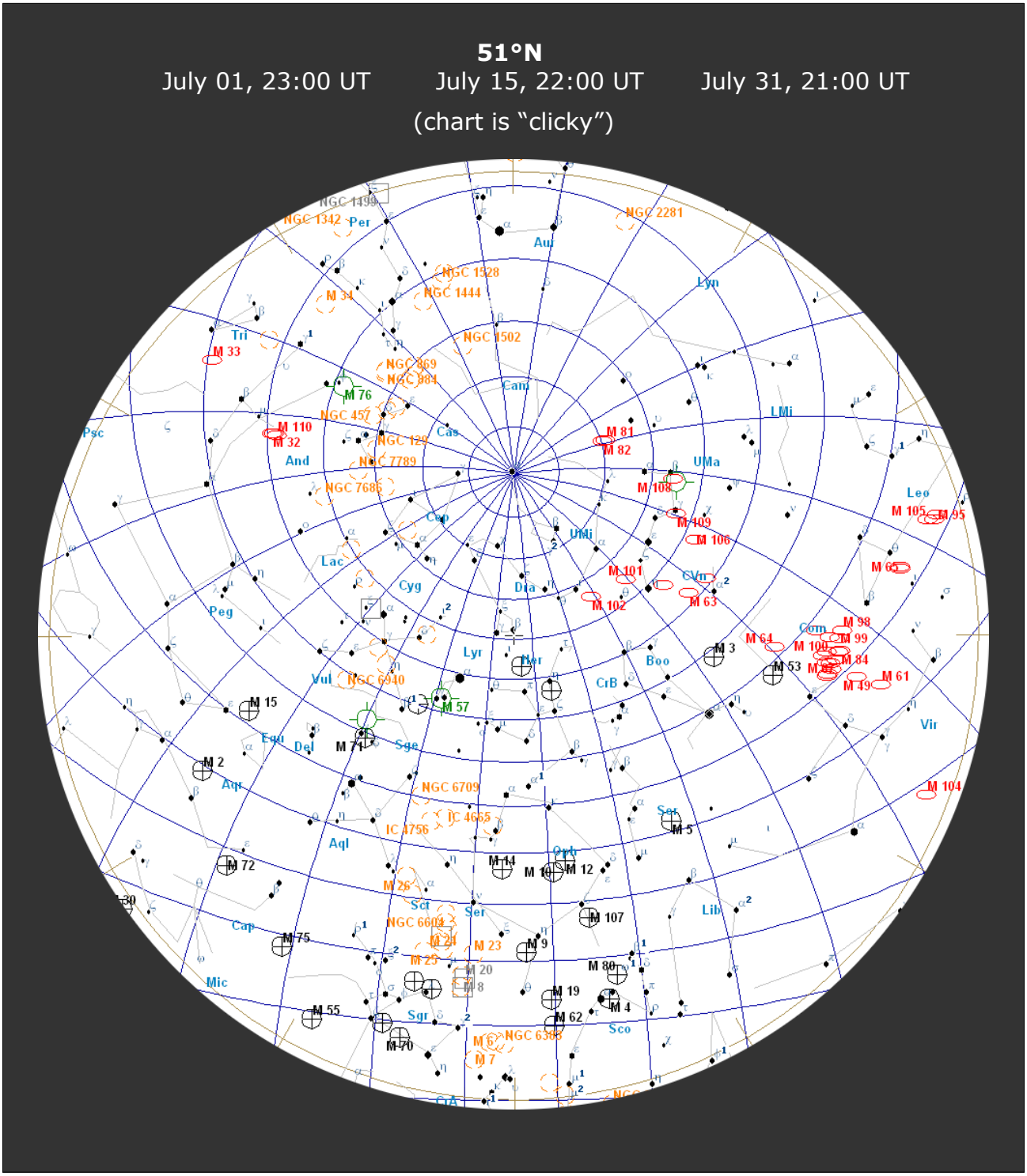
The all-sky chart on the next page reveals a lot about the structure of the Milky Way galaxy. Running in a strip down the middle, coinciding with the Milky Way itself, is the orange band of open clusters. Here, we are looking along the plane of the spiral arms which, of course, is where the star-forming (and, hence, open cluster forming) regions are. The higher density of planetary nebulae (green) here is due solely to the fact that there are more stars here.

This is flanked by the black bands of globular clusters. These form a halo around the galaxy itself. In the lower (southern) part of the chart, we are looking towards the centre of the galaxy, and so the globular halo is denser here than where it flanks the Milky Way through Cassiopeia and Perseus in the upper part of the chart, where we are looking away from the galactic centre.

Lastly, when we look away from the plane of our galaxy, we are more able to see other galaxies in much deeper space (the red regions on the chart).

NGC 457 (the Owl Cluster) and NGC 663 in Cassiopeia, and the Perseus Double Cluster are visible low in the north. More open clusters are visible in the southern sky as the region around 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 inverted 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

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.



includes M16 (the Eagle Nebula), M17 (the Swan or Omega Nebula), M23, M24 (the Sagittarius Star Cloud) (the densest accumulation of stars visible in binoculars anywhere in the sky), and M25. A little to the northeast, in Scutum, is M11 (the Wild Duck Cluster). This is the densest known open cluster, which enables it to be distinguished from the Milky Way background.

While you are here, take the opportunity to look at the Scutum Star Cloud as a backdrop to this cluster; it is second only to M24 for star density in the Milky Way.

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.

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 technology consisted of rocks, sticks and bones.

In July, we are able to look out of the plane of the Galaxy during the evening, making 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.

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.

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 M92, it is easier to resolve the outer stars of the latter one. M5 in Serpens is also visible on these summer nights. It 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.

The easiest planetary nebula, M27 (the Dumbbell Nebula – although I insist that it looks more like an apple core than a dumbbell!) 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 appearance of giant ghostly 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

July Deep Sky Objects by Right Ascension					
Object	**Con**	**Type**	**Mag**	**RA (hhmmss)**	**Dec (ddmmss)**
M31 (the Great Andromeda Galaxy)	And	gal	4.3	004244	411608
NGC 457 (the ET Cluster, the Owl Cluster)	Cas	oc	6.4	011932	581727
NGC 663	Cas	oc	7.1	014601	611406
NGC 884 and NGC 869 (the Perseus Double Cluste	Per	oc	5.3	022107	570802
M81 (NGC 3031)	UMa	gal	7.8	095533	690401
M82 (NGC 3034)	UMa	gal	9.2	095554	694059
M51 (NGC 5194, the Whirlpool Galaxy)	CVn	gal	8.9	132952	471144
M101 (NGC 5457)	UMa	gal	7.7	140312	542057
M5 (NGC 5904)	Ser	gc	5.7	151833	020459
M13 (NGC 6205, the Great Hercules Globular Clus	Her	gc	5.8	164141	362738
M92 (NGC 6341)	Her	gc	6.4	171707	430812
IC 4665 (The Summer Beehive)	Oph	oc	4.2	174618	054300
M23 (NGC 6494)	Sgr	oc	5.5	175700	-190100
Barnard's Star	Oph	st	9.5	175749	044136
Melotte 186	Oph	oc	3.0	180030	025356
M20 (NGC 6514, the Trifid Nebula)	Sgr	en	6.3	180218	-230159
M8 (NGC 6523, the Lagoon Nebula)	Sgr	en	5.0	180348	-242259
NGC 6572	Oph	pn	9.0	181206	065113
M24	Sgr	oc	4.6	181826	-182421
M16 (NGC 6611, the Eagle Nebula)	Ser	oc	6.0	181848	-134749
M17 (NGC 6618, the Omega Nebula or Swan Neb	Sgr	en	6.0	182048	-161059
NGC 6633	Oph	oc	4.6	182715	063030
M25 (IC 4725)	Sgr	oc	4.6	183146	-190654
M11 (NGC 6705, Wild Duck Cluster)	Sct	oc	5.8	185106	-061600
M27 (NGC 6853, the Dumbbell Nebula, the Apple	Vul	pn	7.6	195936	224318
NGC 6934	Del	gc	8.8	203411	072415
M15 (NGC 7078)	Peg	gc	6.2	212958	121003
M2 (NGC 7089)	Aqr	gc	6.5	213327	-004922

Variable Stars

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	7.06-8.12	0.57d	RR Lyr
TX UMa	7.0-8.8	3.06d	Eclipsing binary
AF Cyg	6.4-8.4	92.5	Semi-regular
ZZ Boo	6.7-7.4	4.99d	Eclipsing binary
U Sge	6.5-9.3	3.38d	Eclipsing binary

Selection of binocular variables (mag < +7.5)			
Star	**Mag Range**	**Period**	**Type**
U Vul	6.7-7.5	7.99d	Cepheid
SU Cyg	6.4-7.2	3.84d	Cepheid
X Cyg	5.9-6.9	16.39d	Cepheid

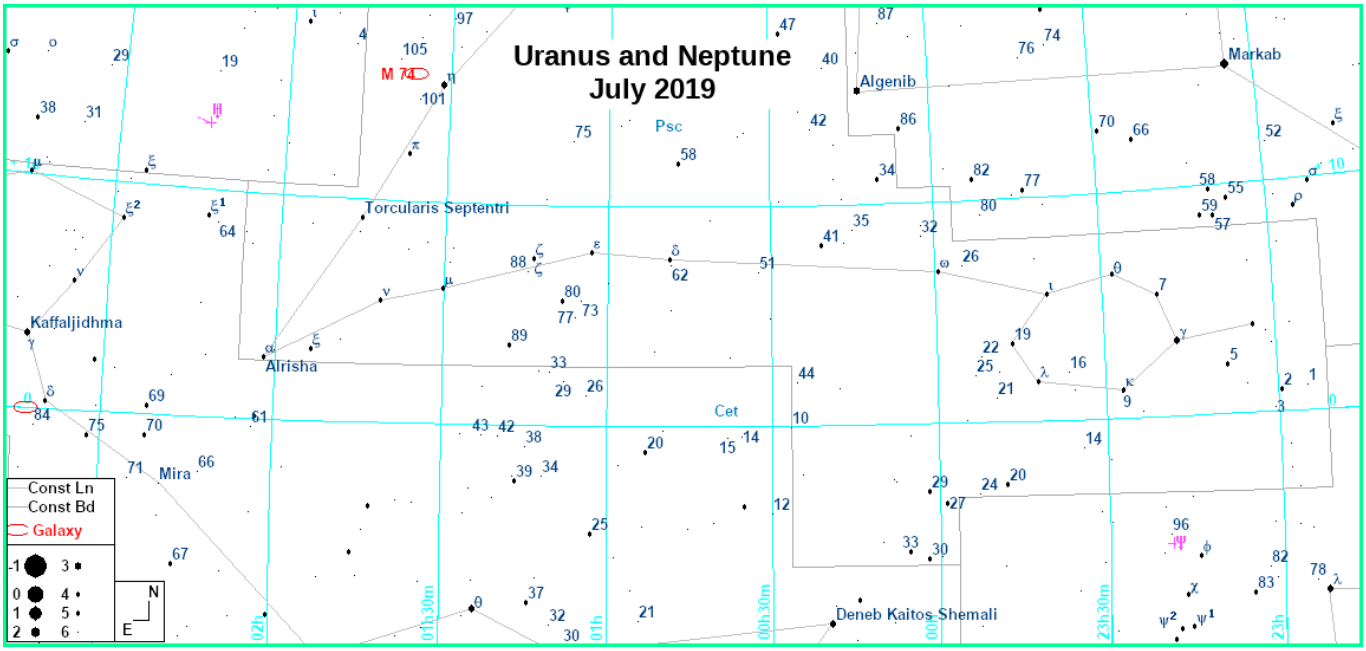
Mira-type stars near predicted maximum (mag < +7.5)		
Star	**Mag Range**	**Period (days)**
R Aqr	5.2-12.4	387

Double Stars

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
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
δ Cep	4.1, 6.1	F5, A0	41

The Solar System

The ice giants **Uranus** and **Neptune**, are best observed after midnight (not least because, early in the month, Uranus (mag. +5.8) doesn't rise until *after* midnight) and become slightly less difficult (although not easy, owing to their low altitudes) as July progresses and they rise earlier. By the end of the month, Neptune (mag. +7.8) culminates (33° high at latitude 51°N) shortly after the end of astronomical twilight. (Chart is "clicky")



Asteroid Occultations

There are no predicted asteroid occultations of stars mag +7.5 or brighter, observable from the UK, this month.

The Moon

July 02	New Moon
July 09	First Quarter
July 16	Full Moon
July 25	Last Quarter

Lunar Occultations

Data are for my location and may vary by several minutes for other UK locations. This month they are all dark limb Disappearances.

Lunar Occultations, July 2019, 50.9°N, 1.8°W							
Date	Time	Phase	Star	Spectral Type	Magnitude	Cusp Angle	Position Angle
Jul 12	22:33:27	D	HIP 79203	F3	6.4	68S	126
Jul 15	00:28:32	D	HIP 88298	B0	5.7	87S	95
Jul 16	00:13:08	D	HIP 92931	B6	5.9	73N	65

Public Outreach & Talks

This month I will be at the following public events; please do come and say "Hello" if you're at any of them.

19th:	Larmer Tree Festival	**The Sky Above** (talk)
21st:	Maumbury ("Moonbury") Rings	**"One Giant Leap" Family Science Day** (public outreach)
23rd:	Frogham Fair	**Astronomy Display and Solar Observing** (public outreach)

It's also worth preparing for the UK's original (& still the best) Astronomy and Music festival:

Equipment Review

This month we look at the **Manfrotto Magic Arm**.

For ages, I've been trying to devise a simple and flexible way of mounting a binocular to a reclining chair for hands-free observing. In my mind, the ideal seemed to be some sort of sprung-lever device like an anglepoise, mounted to the middle of the top bar/rail of the chair. I've never been able to get it to work satisfactorily – it's always been far more trouble than it's benefits warrant. The main problem is that it mounts to a round section bar, and the clamp has to be done up extraordinarily tightly if it's not to rotate due to the turning moment of the load. To work even minimally well it would need to be permanently fixed, which immediately compromises the flexibility and utility of the system. An anglepoise is as much use as a chocolate fireguard if it's mounted horizontally to the vertical side bar of a chair.

Then I came across the "magic arm". This is a multi-jointed contraption in which a single knob controls the stiffness of all the joints; it's intended for photographic equipment. I acquired a small one which is useful for mounting lightweight luminaires, but is neither long nor strong enough to hold binoculars safely in front of my face. The spec of the *Manfrotto* version seemed as though it might be suitable and, sure enough, I found that other people had tried it with varying degrees of success. A used one came up for sale, so I snapped it up and have been playing with it for a few months.

There are two Manfrotto versions: the 143 is operated by a lever, and the 244, the one I have – *Manfrotto* call it a "variable friction arm", is operated by a handwheel. They sometimes come as kits, which usually makes them cheaper than buying the two end attachments that you will need separately

from the arm. These are the 035 Superclamp that fixes the arm to the chair, and the 143BKT Camera Bracket to attach your binoculars, via a standard tripod adaptor bracket.

Once you get the hang of it, it is pretty easy to use. It's specified for loads up to 3kg but, like all photography-intended kit when used for mounting binoculars, this is hopelessly optimistic. It's close to its limit for this purpose with the 1.5kg 10x50 binoculars shown in the picture. It was an unpleasant struggle to use with my 2.1kg 16x70.

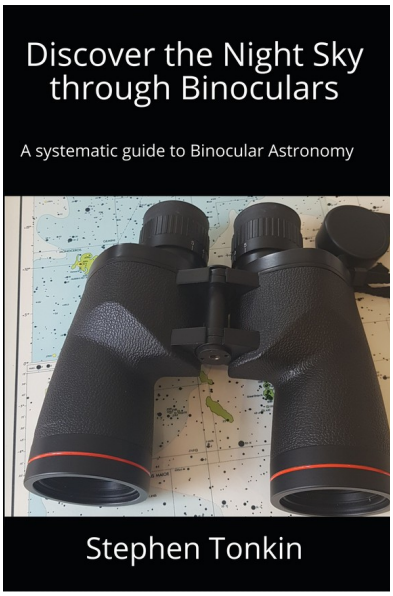
The main thing to get used to when you set it up is that it sags a little once you release the binoculars (which you need to hold as you tighten the knob). However, this sag is consistent and it soon becomes instinctive to allow for it.

The other important "feature" is that the binoculars are not completely still: you can see the stars keeping perfect time with your pulse (again, others have mentioned this before). This doesn't bother me too much, as it's a tiny pulse with my setup, so I haven't yet experimented with ways to damp it. In any case, it's still a much steadier view than you get with any sort of hand-holding.

Despite the fact that I quite like the hands-free, semi-reclined setup, which is lighter and more compact than my other binocular-steadying methods, this isn't something I will readily recommend as an effective option: it certainly won't be to everybody's liking. Realistically, it's an expensive way (unless you have a magic arm already, or are likely to have another use for which it will be indispensable) of solving a not-very-huge problem. But if you get the chance, do try it; it's the only way you'll find out if it suits you or not.

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 one of my books, **Binocular Astronomy** or **Discover the Night Sky through Binoculars**. Click on the cover 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

Acknowledgements:

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 *The International Variable Star Index*
Occultation data derived with Dave Herald's *Occult*

Disclosure: Links to *Amazon* or *First Light Optics* may be affiliate links