



The Binocular Sky

No. 104
July 2020

Newsletter



Introduction

I hope you are in good health as July's **Binocular Sky** Newsletter reaches you. Although it is primarily targeted at binocular (and small telescope) observers in the UK, this particular community extends well south of the Equator. So welcome!

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.

I hesitate to write this, given recent history of our dashed expectations of "promising" comets, but we have another one, **C/2020 F3 (NEOWISE)**. It's visible in SOHO images and might just live up to expectations. (But it might not!)

The binocular planets, **Uranus** and **Neptune** are becoming visible in the pre-dawn sky, as is **Ceres** but the short darkness means that there is only one suitable lunar occultations of a star, a dark-limb reappearance.

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The Deep Sky

(Hyperlinks will take you to finder charts and more information on the objects.)

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 4s665](#), 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

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.

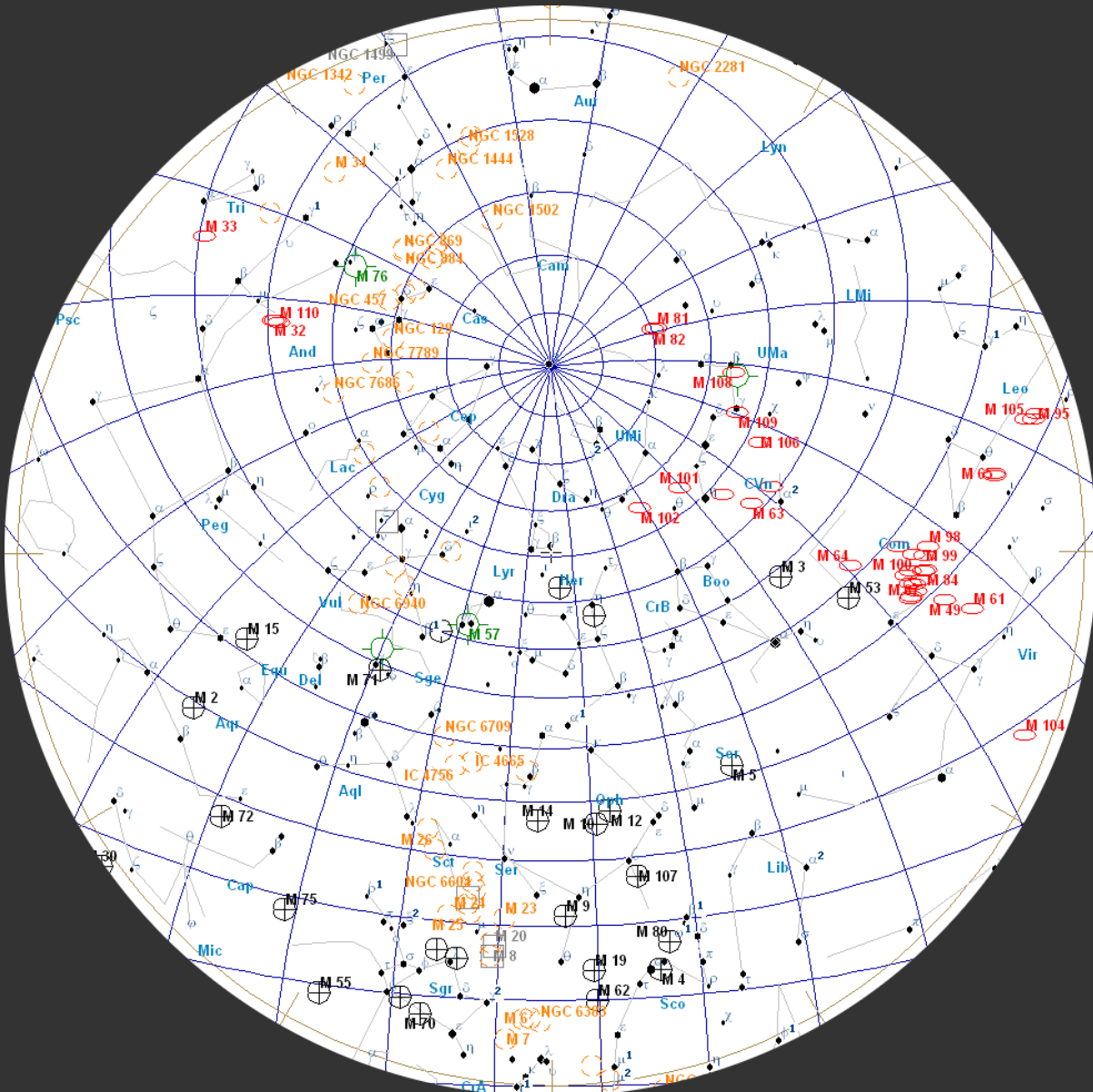
51°N

July 01, 23:00 UT

July 15, 22:00 UT

July 31, 21:00 UT

(chart is "clicky")



and Sagittarius that 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.

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 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 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.

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.

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.

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 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 (although some people see it as being blue).

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, you can visit: https://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 Cluster)	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 Cluster)	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 Nebula)	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 Core Nebula)	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

Mira-type stars near predicted maximum (mag < +7.5)		
Star	Mag Range	Period (days)
R Aqr	5.2-12.4	387
S CrB	5.8-14.1	360.26

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
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

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

(Charts are “clicky” for higher resolution alternatives)

The Moon

July 05	Full Moon
July 12	Last Quarter
July 20	New Moon
July 27	First Quarter

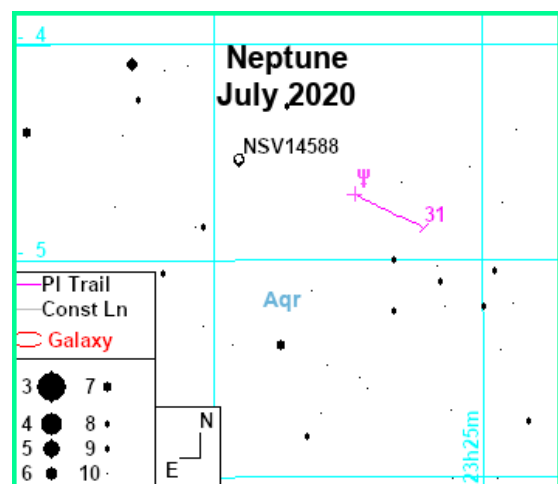
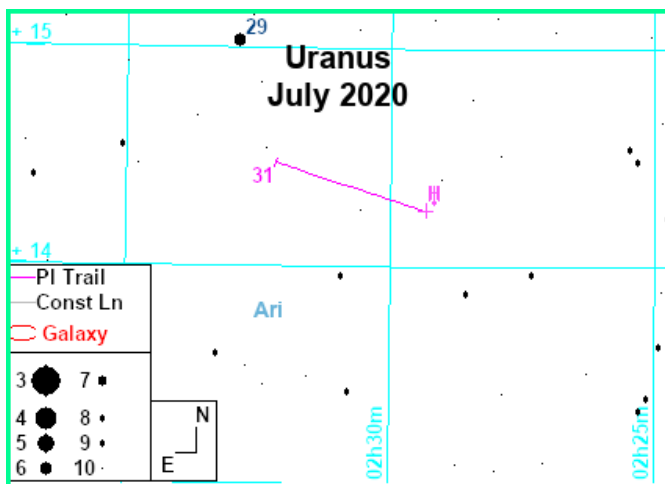
Lunar Occultations

Data are for my location and may vary by several minutes for other UK locations. The phases are **(D)**isappearance, **(R)**eappearance and **(Gr)**aze; they are dark-limb events unless there is a **(B)**.

Lunar Occultations July 2020 50.9°N 1.8°W							
Date	Time (UT)	Phase	Star	Spectral Type	Magnitude	Position Angle	Cusp Angle
Jul 08	00:32:26	R	Eps Cap	B3	4.5	149	87N

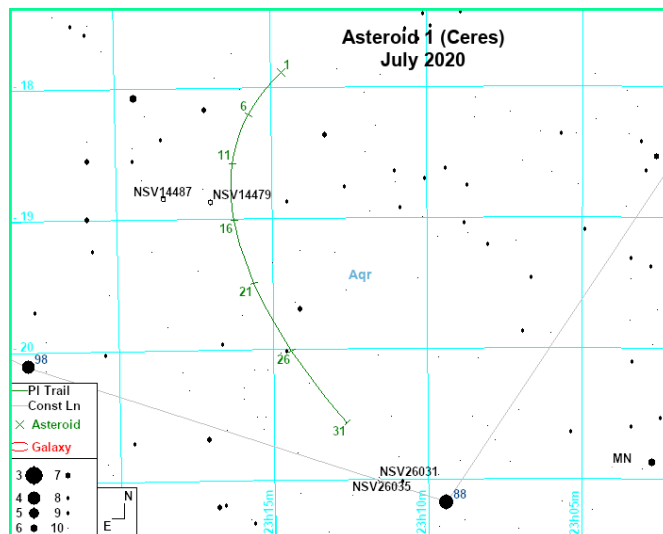
Planets

The binocular planets, **Uranus** and **Neptune** are back and are now observable in morning twilight, in *Aries* and *Aquarius* respectively.



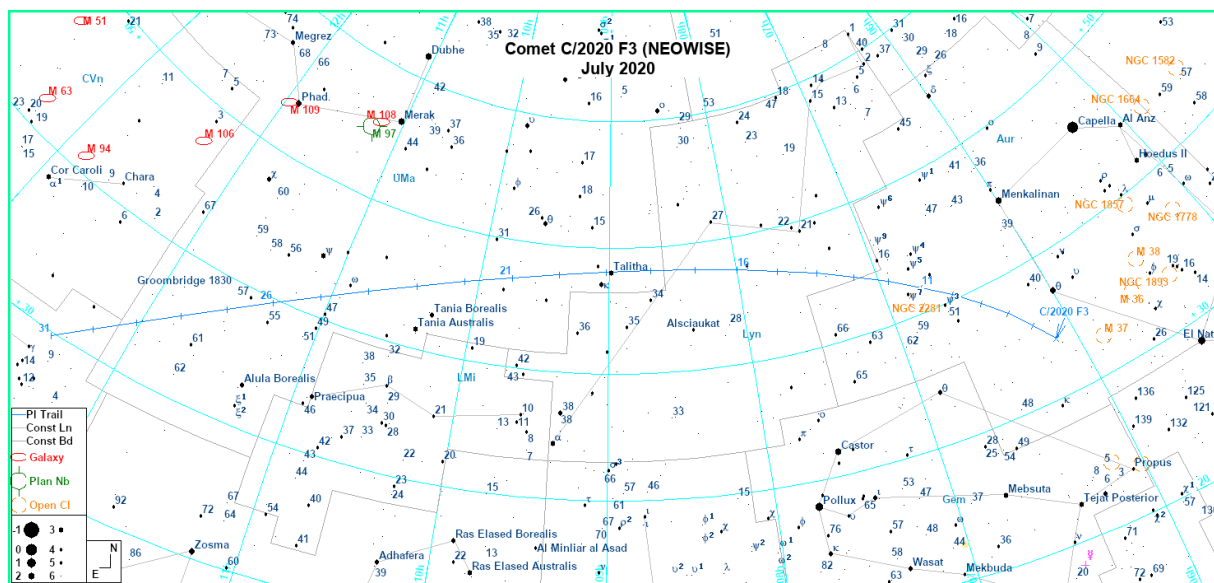
Asteroids

Asteroid 1 (Ceres) is also available in Aquarius, well to the south of Neptune. It brightens from mag +8.6 to +8.0 during the month.



Comets

Comet C/2020 F3 (NEOWISE) seems to have survived perihelion passage and should be visible in southern UK skies from about the 6th, which is when the trail begins. It is expected to reach naked eye brightness during the month as it passes into *Ursa Major*.



Public Outreach & Talks

All my “in person” public talks and outreach events for the next few months have been postponed or cancelled. However, I will be doing some “Zoom talks” during the month. If you’re at any of them, do give me a virtual “wave”:

July 08	Dorking U3A	Time and Calendars
July 13	Wolverhampton AS	Two Eyes are Better than One
July 21	Sale Probus Club	Are We Alone?
July 24	Avon Heath Country Park	Night Walk (socially distanced!)

Zoom Talks during “Lockdown”?

I regularly give talks, on *Binocular Astronomy* and numerous other astronomical topics. During the current “lockdown” in the UK, I’d be happy to do this on Zoom if that is of interest. For astronomy societies (and some other groups), I would not charge unless I incurred expenses (although I have never knowingly refused a donation made on my behalf to the [BAA Commission for Dark Skies](#)).

If you would like a talk for your society/group,
[Click here for current talks.](#)

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**.
- Make a small PayPal donation to newsletter@binocularsky.com

Wishing you Clear Dark Skies,

Steve Tonkin

for

The Binocular Sky

Acknowledgements:

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

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