



The Binocular Sky

No. 117
September 2021

Newsletter



Introduction

Welcome to September's **Binocular Sky** Newsletter.

Firstly, may I express my great appreciation for the good wishes I received after announcing last month's hiatus. They certainly helped to take the pressure off and allow me to recover without worrying about having to do the newsletter.

Autumn is, for me, a uniquely special time for visual astronomy. The lingering warmth of summer keeps it relatively pleasant to be outdoors at night, the lengthening nights mean there is time to both observe and sleep, and the sky itself has so much to offer. The Milky Way, with its associated open clusters and dark nebulae arches overhead, so lower down, but still at a reasonable altitude, we can see numerous galaxies and globular clusters. The appearance of Capella, low in the northeast, presages the fabulous winter-evening constellations that we have in store. The autumn sky offers us the choice to rise early (or stay up late) if we are impatient for these winter-evening delights.

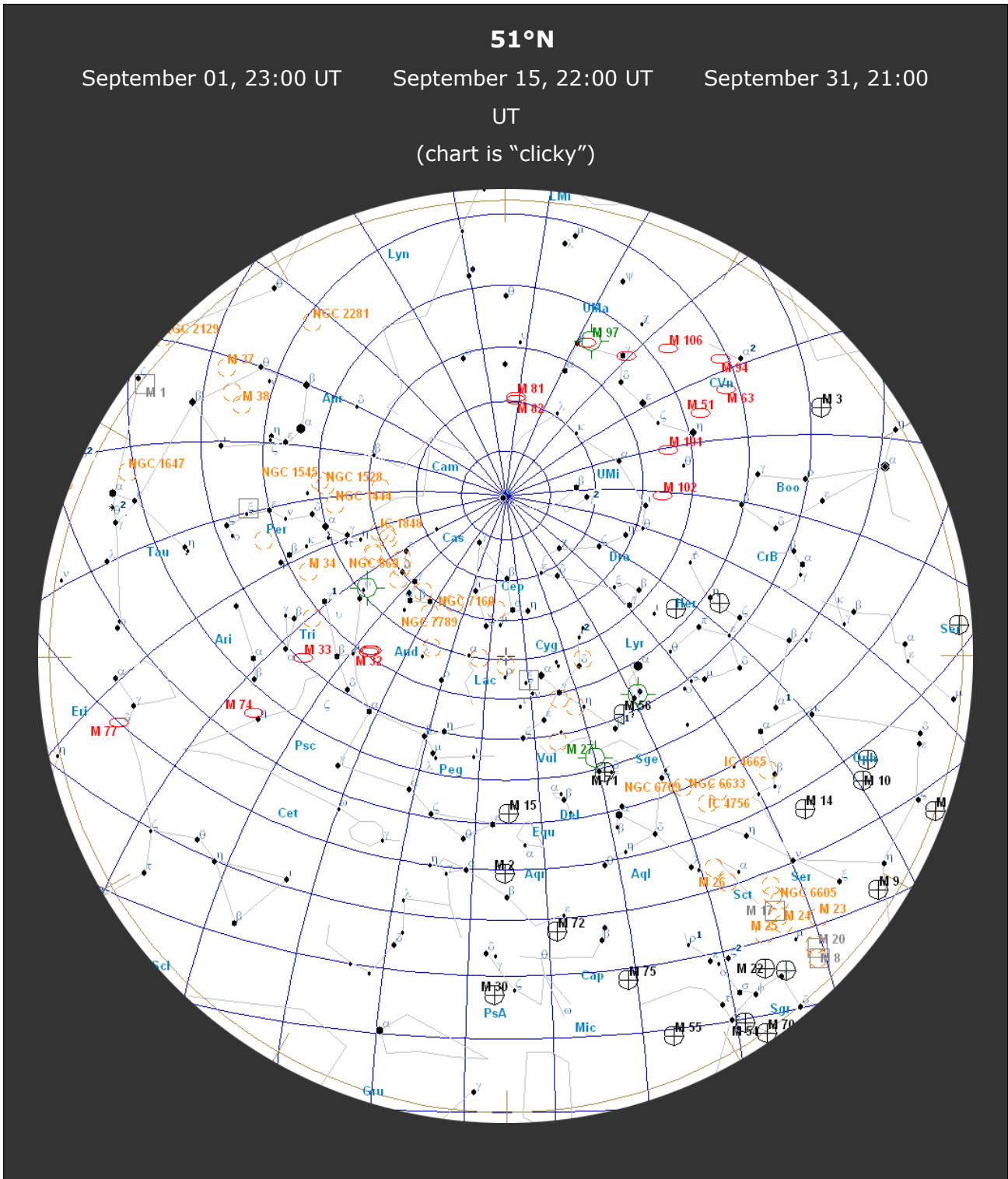
In the Solar System, the increasing darkness means that we have a few more lunar occultations. Although we have now lost **Vesta**, and the binocular planets (ice-giants **Uranus** and **Neptune**) are back.

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The Deep Sky

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

As the sky darkens at twilight, the Milky Way, always a pleasure to scan with binoculars of any size, arches overhead. In the north are [NGC 457](#) (the Owl Cluster) and [NGC 663](#) in Cassiopeia and the Perseus Double Cluster, from



which you can easily find Stock 2 (the Musclemans Cluster). Kemble's Cascade and its "splash pool", NGC 1502, are also conveniently placed, and the cascade is near-vertical in autumn evenings, adding to the ribbon-waterfall illusion. To the east of them lie M34 in Perseus and NGC 752 in Andromeda, which is at the business end of a hockey-stick asterism that has the double-star 56 And at its business end.

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.

More open Clusters are visible in the southern sky in the region of Ophiuchus. These include Melotte 186, NGC 6633, IC 4756, 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, which is the densest accumulation of stars visible to binoculars anywhere in the sky), 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.

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. M81 (Bode's Nebula) and M82 (The Cigar Galaxy), both of which are visible in a 50mm binocular, are at a comfortable height in the northwest. 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 more 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.

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 globular clusters, 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. 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.

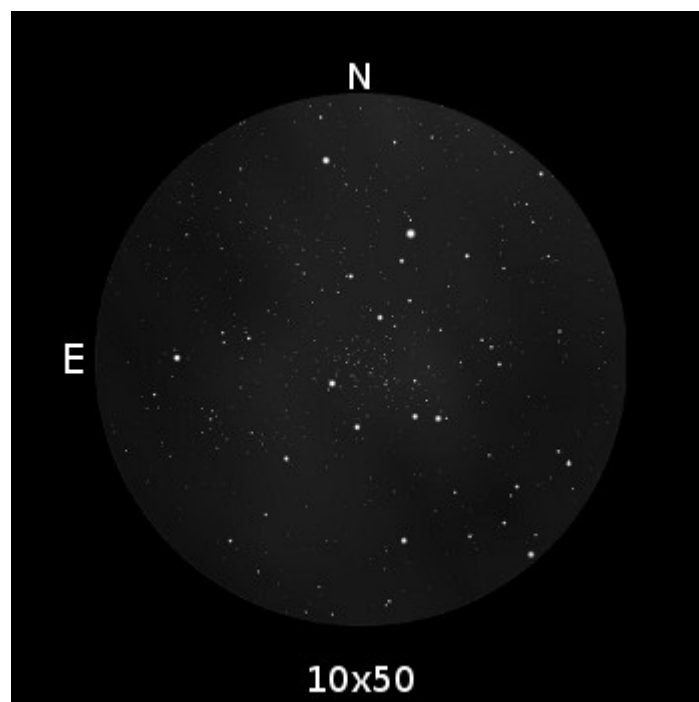
The easiest planetary nebula, M27 (the Dumbbell Nebula – although I insist that it looks more like an apple core than a dumbbell!) – is visible in the evening skies in even 30mm binoculars. At the other extreme, if you have binoculars of

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.

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 7293 is observable in Britain before midnight.

The two bright emission nebulae, M20 (the Trifid) and the larger, brighter and easier M8 (the Lagoon) will be sinking into the twilight by the end of the month; 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.

For interactive maps of Deep Sky Objects visible from 51°N, you can visit: https://binocularsky.com/map_select.php



Graff's Cluster (IC 4756)

September 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
Eddie's Coaster	Cas	ast	7.0	010129	634005
NGC 457 (the ET Cluster, the Owl Cluster)	Cas	oc	6.4	011932	581727
NGC 663	Cas	oc	7.1	014601	611406
NGC 752	And	oc	5.7	015742	374700
Stock 2 (the Muscleman Cluster)	Cas	oc	4.4	021434	591358
NGC 884 and NGC 869 (the Perseus Double Cluster)	Per	oc	5.3	022107	570802
M34 (NGC 1039)	Per	oc	5.2	024204	424542
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
IC 4756	Ser	oc	4.6	183900	052700
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
NGC 7293 (the Helix Nebula)	Aqr	pn	6.5	222938	-205013

Variable Stars

Mira-type stars near predicted maximum (mag < +7.5)		
Star	Mag Range	Period (days)
W And	6.7-14.6	397.3
o Cet	2.0-10.1	332

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
οΣ525 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
Σ1 1 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

The Moon

September 07	New Moon
September 13	First Quarter
September 20	Full Moon
September 29	Last Quarter

Asteroids

All the asteroids are 8th magnitude or fainter this month, but we'll have both Ceres and Vesta back next month.

Lunar Occultations

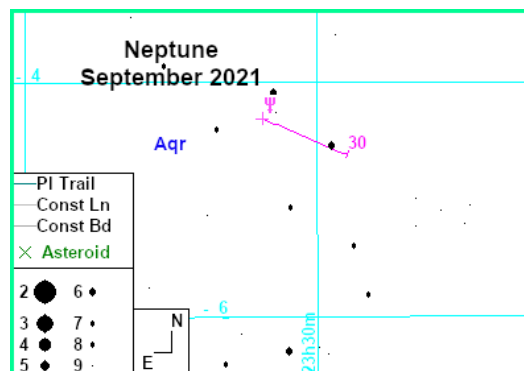
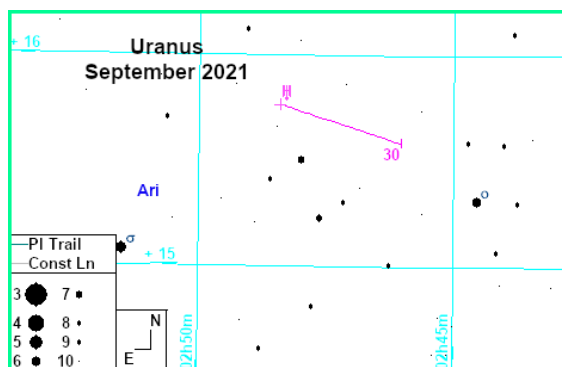
Data are for my location and may vary by several minutes for other UK locations. The phases are **(D)**isappearance, **(R)**eappearance and **(Gr)**aze; they are dark-limb events unless the Cusp Angle is negative.

Lunar Occultation September 2021 50.9°N 1.8°W							
Date	Time (UT)	Phase	Star	Spectral Type	Magnitude	Position Angle	Cusp Angle
Sep 01	00:24:58	R	132 Tau	G8	5.0	272	87N
Sep 02	01:01:24	R	eps Gem	A3	3.1	259	73S
Sep 02	03:30:19	R	QU Gem	K0	6.8	309	58N
Sep 03	02:38:11	D	kap Gem	G8	3.6	109	-84S
Sep 03	03:33:41	R	kap Gem	G8	3.6	251	57S
Sep 14	18:44:53	D	HIP 89678	K3	4.7	146	35S
Sep 20	01:37:01	D	HIP 114750	K5	6.1	18	66N
Sep 28	01:35:20	R	HIP 26062	B8	7.0	276	81N
Sep 30	02:51:19	R	57 Gem	G8	5.0	213	24S

Planets

Uranus (mag +5.7) is still best observed after midnight all month, and **Neptune** (mag +7.8), within an hour or so either side of midnight. Neptune transits during astronomical dark all month, and Uranus will do so for most of the British Isles from the second week of the month.

(Charts are "clicky")



Public Outreach & Talks

If you find yourself at any of these, do come and introduce yourself or give me a virtual “wave”.

Dates are UT.

(Z indicates “Zoom”; H indicates “Hybrid” zoom and physical meeting.)

Sept 6 th	North Lincs AS (Z)	Two Eyes are Better Than One
Sept 15 th	Crickhowell Probus Club (Z)	Time and Calendars
Sept 17 th	Crawley AS (Z)	Two Eyes are Better Than One
Sept 21st	Fordingbridge Astronomers (H)	Ten Ways the Universe Tries to Kill You
Sept 24th	Vectis AS	Two Eyes are Better Than One

Zoom/Webex Talks during the SARS-CoV-2 pandemic?

I regularly give talks, on *Binocular Astronomy* and numerous other astronomical topics. I’m happy to do this – potentially anywhere in the world – on Zoom or Webex if that is of interest.

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

For schools/scouts/guides, etc., I am a STEM Ambassador and will charge you nothing except travel expenses.

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](#)**.
- Buy equipment or books through an affiliate link in the newsletter or on <https://binocularsky.com>
- 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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