The Binocular Sky Newsletter

No. 129
September 2022

Introduction

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

Autumn is, for me, a uniquely special time for visual astronomy. 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 lingering warmth of summer makes it relatively pleasant to be outdoors at night, and the lengthening nights mean there is time to both observe and sleep.

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. We still have **Vesta**, although it's dimming and the binocular planets (ice-giants **Uranus** and **Neptune**) now transit during astro-dark.

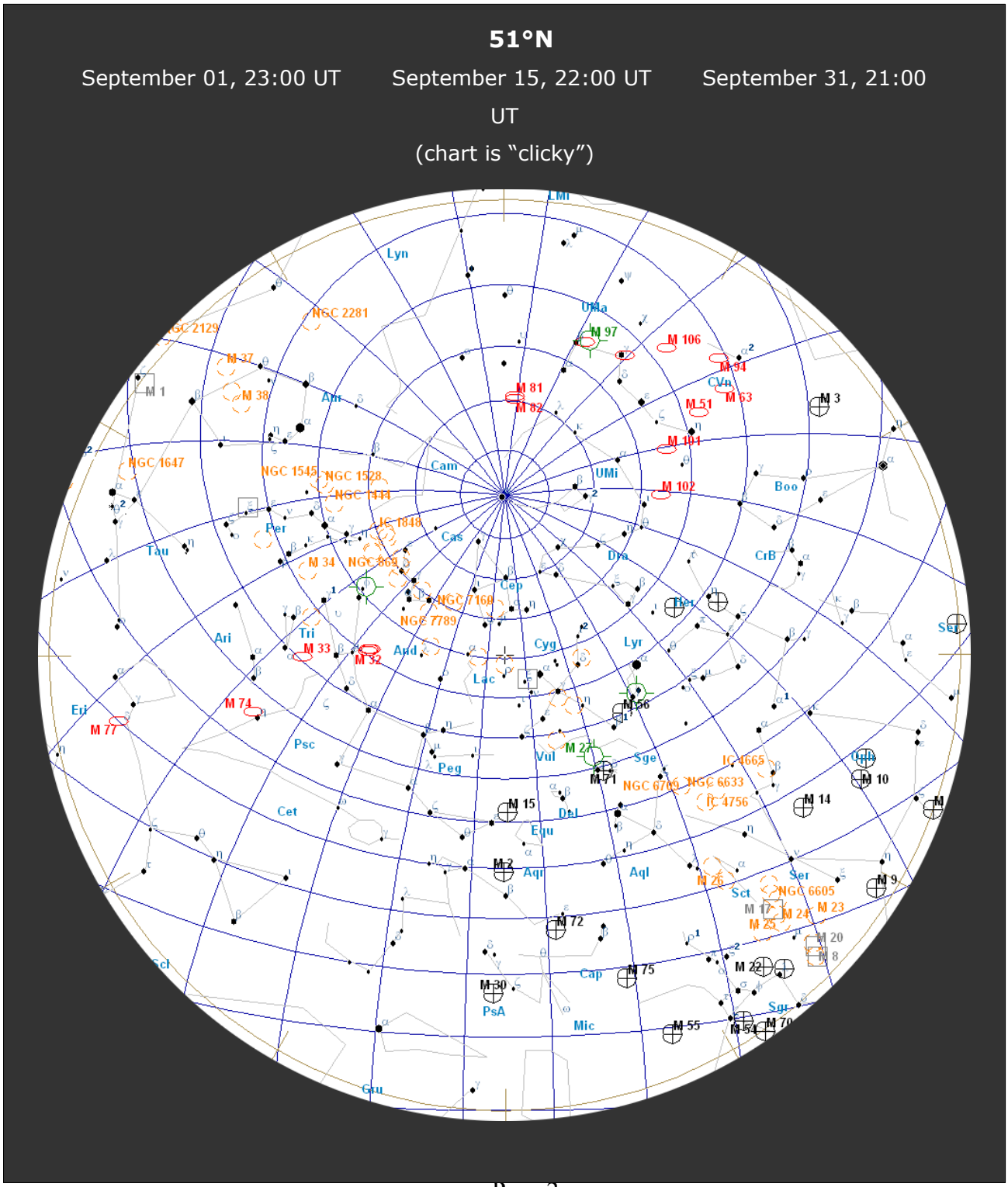
We have a lunar occultation (reappearance phase) of **Uranus** to look forward to.

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 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 Muscleman 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 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 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.

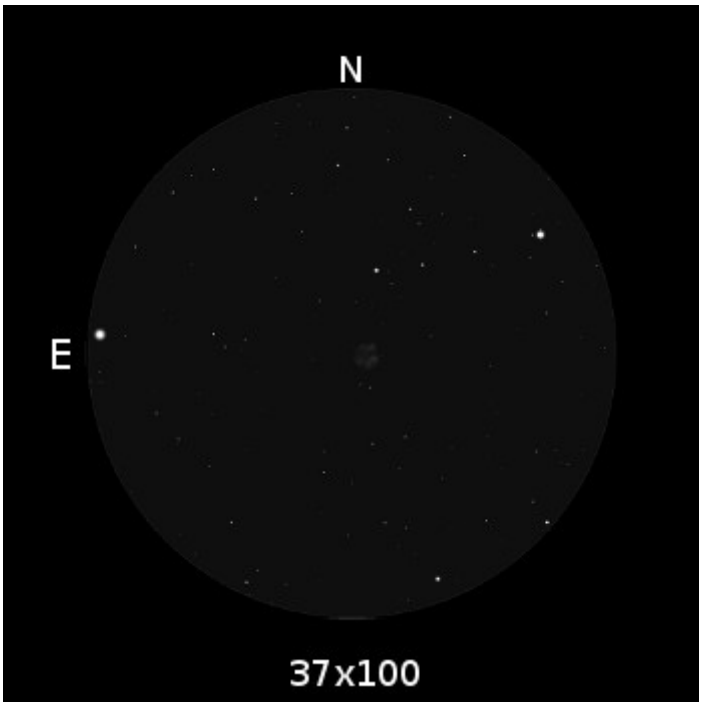
The easiest planetary nebula, M27 (the Dumbbell Nebula – although I insist that it looks more like an apple core than a dumbbell!) – is visible in the evening skies in even 30mm binoculars. At the other extreme, if you have binoculars of

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. If you do attempt it, be sure also to observe Vesta (p9), which is nearby this month.

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



Helix Nebula (NGC 7293)

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 Cluste	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 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 Nebu	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	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)**
R Aqr	5.2-12.4	387
X Oph	5.9-8.6	338

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
OΣ525 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
ΣI 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 03	First Quarter
September 10	Full Moon
September 17	Last Quarter
September 25	New Moon

Lunar Occultations

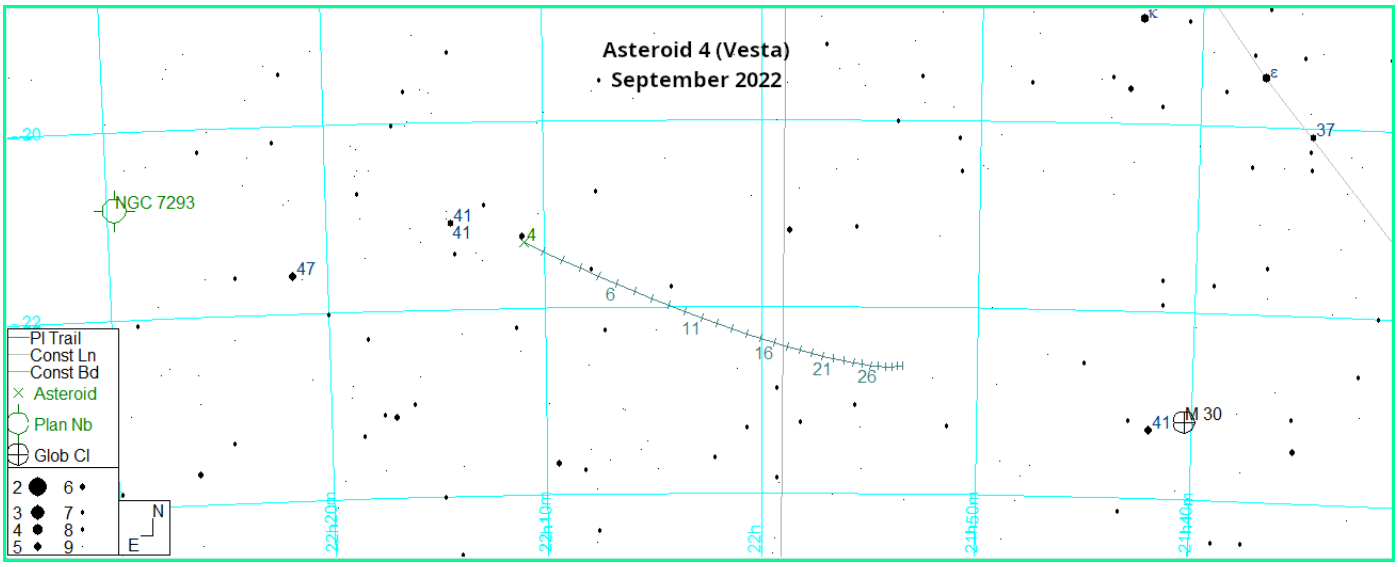
Data are for my location and may vary by several minutes for other UK locations. The phases are (**D**)isappearance, (**R**)eappearance and (**Gr**)aze; they are dark-limb events unless the Cusp Angle is negative. The highlight is the reappearance of Uranus 14th.

Lunar Occultations September 2022 50.9°N 1.8°W							
Date	**Time (UT)**	**Phase**	**Star**	**Spectral Type**	**Magnitude**	**Position Angle**	**Cusp Angle**
Sep 06	23:06:45	D	60 Sgr	G8	4.8	29	45N
Sep 11	21:08:08	R	14 Cet	F5	5.9	236	68S
Sep 13	05:16:24	R	CY Psc	M0	6.4	246	84S
Sep 14	22:18:60	R	Uranus		5.7	269	75N
Sep 15	23:39:21	R	HIP 24777	K0	6.8	269	79N
Sep 16	04:11:28	R	37 Tau	K0	4.4	258	89S
Sep 16	04:27:39	R	39 Tau	G5	5.9	230	61S
Sep 17	03:12:35	R	HIP 22949	F0	6.3	195	21S
Sep 17	04:56:34	R	98 Tau	A0	5.8	274	80N
Sep 17	22:49:24	R	125 Tau	B3	5.2	245	67S

Asteroids

Asteroid 4 (Vesta) dims from mag +6.2 to +7.1 during the month. It lies between the **Helix Nebula (NGC 7293)** and the globular cluster **M30**.

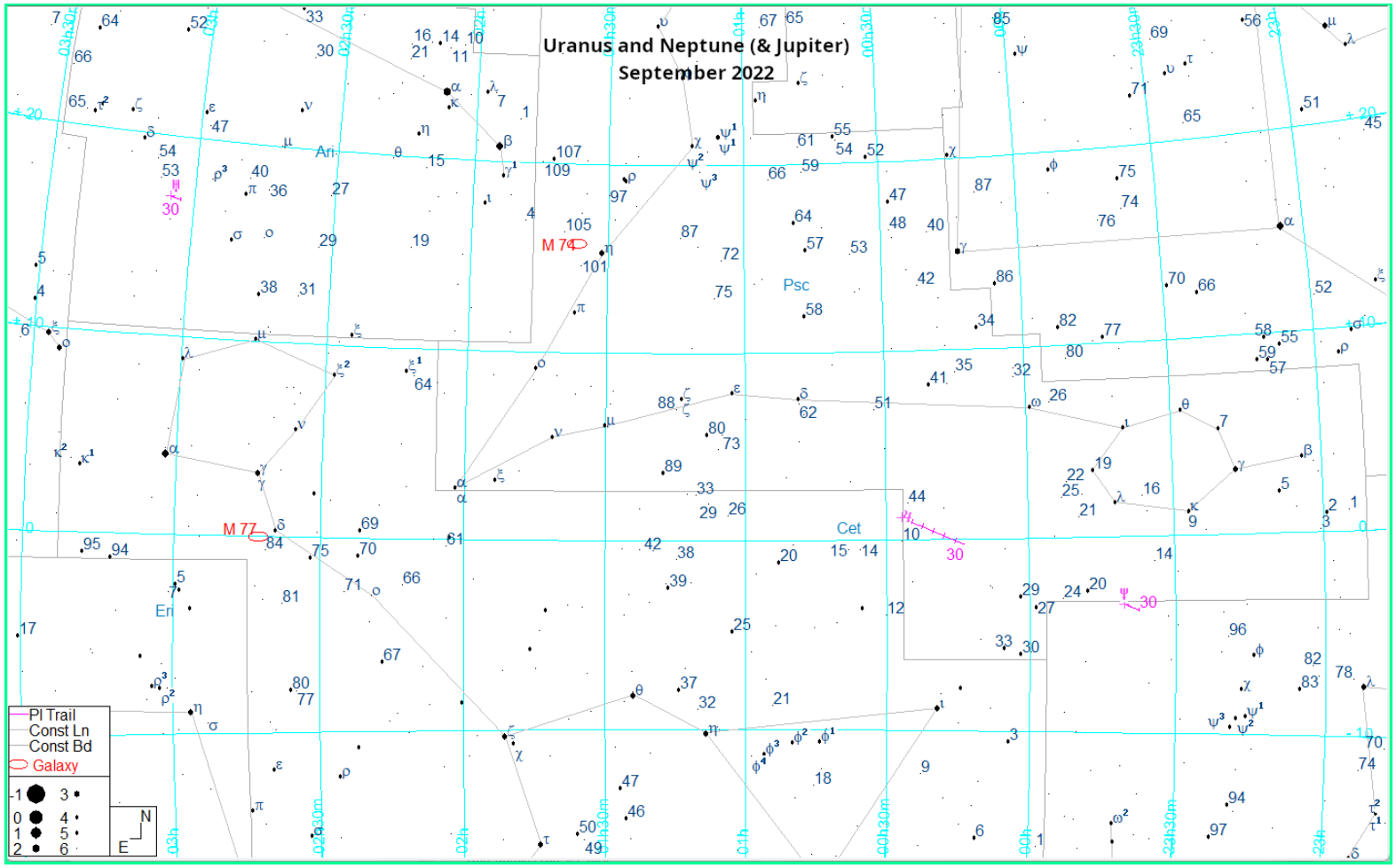
(Chart is "clicky")



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. They both transit during astronomical dark all month. Uranus is occulted by the Moon on the 14th.

(Chart is "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 1st	Dorset Earth Mysteries	**Ten Ways the Universe Tries to Kill You**
Sept 5th	Farnham PC	**The Right Light at Night**
Sept 6th	Wessex AS (H)	**Time and Calendars**
Sept 7th	Donhead St Mary PC	**The Right Light at Night**
Sept 8th	Horningham PC	**The Right Light at Night**
Sept 9th	Weymouth AC (H)	**Ask the Panel**
Sept 13th	Maiden Bradley PC	**The Right Light at Night**
Sept 19th	Damerham PC	**The Right Light at Night**
Sept 20th	Teffont PC	**The Right Light at Night**
Sept 21st	Fordingbridge Astronomers (H)	**The September Night Sky**
Sept 27th	Wimborne TC	**The Right Light at Night**

Zoom/Webex Talks?

I regularly give talks, on *Binocular Astronomy* and numerous other astronomical topics. I'd be happy to do this – including locations anywhere in the world on Zoom or Webex – 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 so there will be no fee.

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:

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