Introduction

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

As regular readers will know, my intention is to highlight some of the binocular targets for the coming month. This is primarily intended for visual astronomers, with binoculars or small telescopes, in the UK, but it should have some utility for observers anywhere north of Latitude 30°S and possibly even further south (if you are further south, please let me know!)

In the Solar System, **Uranus** is still available in the evening. We've lost Neptune until late April, but have gained the brighter, and far better placed, **Vesta** – which will be naked eye brightness by the end of the month if you have both good skies and good young eyes.

The "extra star" in Cygnus, **χ Cyg**, is approaching maximum brightness (page 6). You'll need to nab it either in the evening before it gets too low, or in the pre-dawn before the sky gets too bright.

The subject of light pollution is one that has been dear to my heart for three decades, so it's great to see the gradual proliferation of protected Dark Sky places under the aegis of the International Dark Sky Association. Two of the UK ones are having online festivals this month, one of which I have helped to organise. Do take a look – this potentially benefits us all (page 8/9)

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.)

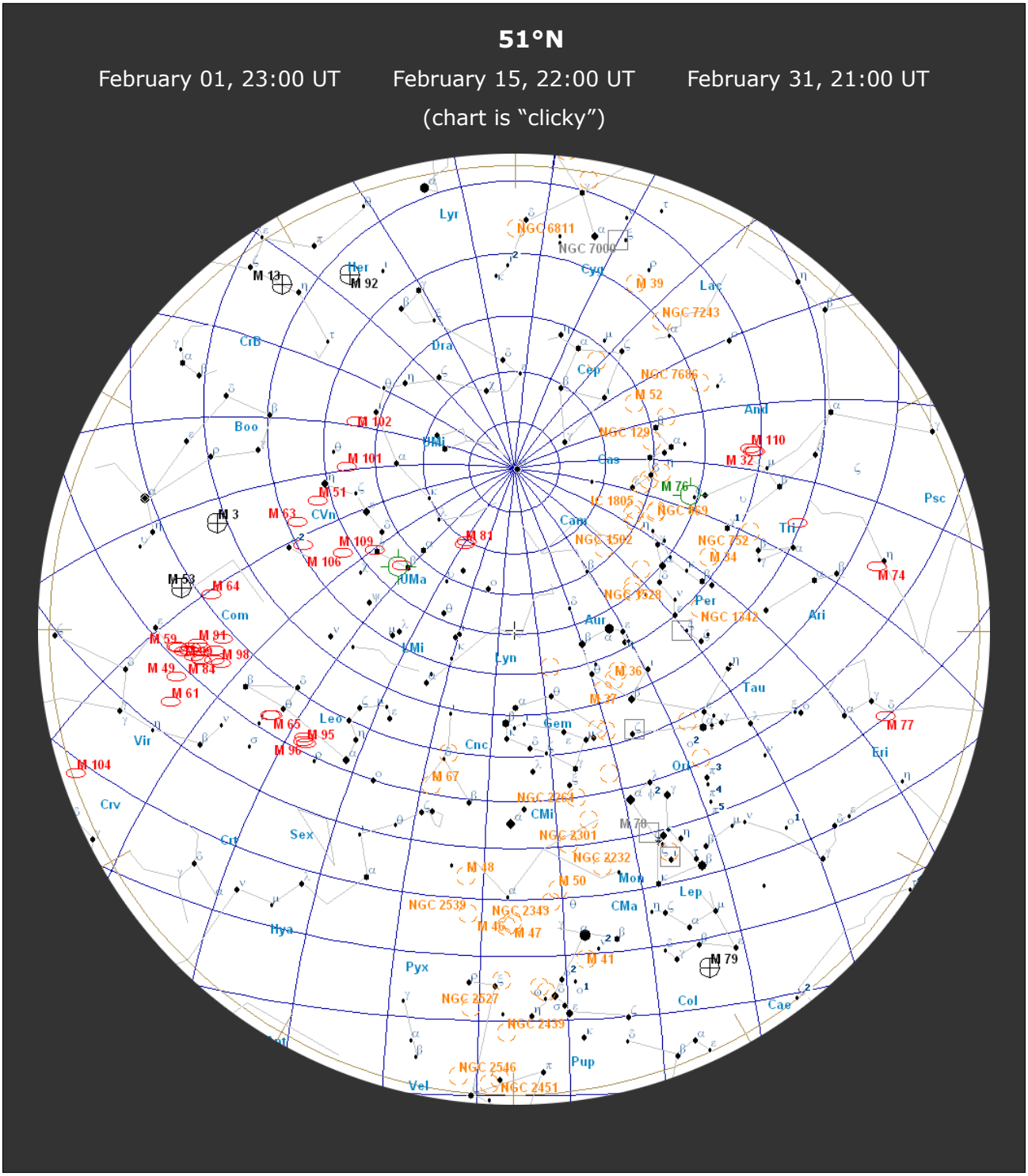
February skies are not markedly different from those of January with respect to what is observable in the evening. We are losing the "summer triangle" constellations (Cygnus, Aquila and Lyra) and the *Pleiades* (M45) culminates before the end of twilight, followed an hour later by the Hyades, the Great Orion Nebula (M42) and the trio of open clusters in Auriga. M35 in Gemini is close behind. If you take the northern tip of the Hyades "vee", *Oculus Boreas*, and pan half a 10x50 field of view towards Perseus, you will find an asterism called *Davis's Dog*. That spans about 3.5° of sky. The stars 51, 56 and 53 Tau form its head, and κ^1, κ^2, υ and 71 form its tail.

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.

Return to M35, and use averted vision to 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. M44 (*Praesepe*) and M67 , two fine open clusters in Cancer, are very well placed for evening observation. Lower in the southern sky are more well-placed open clusters M46, M47 and, near Sirius, M41.

In the north rather indistinct open cluster NGC1502, is brought to prominence by a favourite binocular asterism named Kemble's Cascade, although the imagination of it being a ribbon waterfall plunging into a splash-pool (NGC 1502) needs some gravity-defying modification because, in late winter evenings, the waterfall flows upwards!

While you are observing in the region of the Orion Nebula, take the time to study R Leporis (*Hind's Crimson Star*), which is near maximum and is a candidate for the reddest star in the heavens. To the north of that, just to the SE of Alnitak (ζ Ori) is the multiple star σ Orionis. At the time of writing, *Betelgeuse* (*α Ori*) is continuing to dim; on the evening of Jan 29 it was only very slightly brighter than *Bellatrix* (*γ Ori*) at about mag +1.5. This faintness



makes its colour less distinct to the naked eye, but binoculars restore it – it seems to me that it is redder than previously. What do you perceive?

Although The *Great Andromeda Galaxy*, M31 and M33 (*The Pinwheel*), are sinking lower into the evening twilight, they are still observable this

month. M31 is still a naked eye object in moderately dark skies. It is large and bright enough to be able to withstand quite a lot of light pollution (making it available to urban observers), and is at a comfortable elevation for straight-through binoculars.

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.

M33 has a low surface-brightness and benefits from lower magnification. This generally makes it easier to see in, say, a 10x50 binocular than in many "starter" telescopes. If you find it difficult to see, make sure you have the correct region of sky, mid-way between *Metallah* (*α Tri*) and *82 Psc*), approximately central in your field of view, and try the tapping technique – it may well make it visible, if only as a very slightly brighter patch of sky. Once you have found the best part of the field of view is best to direct your gaze at, you will be able to use this technique to bring some previously-invisible objects to visibility.

High in the northern sky, the Ursa Major pair of Bode's Nebula (M81) and the Cigar Galaxy (M82) are conveniently placed for most of the night. Later in the evening, look out for the galaxy trios in Leo (M95/96/105 and M65/66/NGC3628) and Markarian's Chain in Coma Berenices rising in the west, although they are not at their best until after midnight. 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.

Lastly, please do take this opportunity to appreciate *Herschel's Garnet Star, μ Cep*, which is at a comfortable elevation early in the evening. William Hershel described it as "*a very fine deep garnet colour … a most beautiful object, especially if we look for some time at a white star before we turn … to it, such as Alpha Cephei, which is near at hand.*" The wide field of medium-sized binoculars enables you to hold it in the same field as *Alderamin (α Cep)*, so you can appreciate Herschel's comparison.

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

February Deep Sky Objects by Right Ascension					
Object	**Con**	**Type**	**Mag**	**RA (hhmmss)**	**Dec (ddmmss)**
M45 (the Pleiades)	Tau	oc	1.6	034729	240619
Kemble's Cascade	Cam	ast	9.0	035752	630711
Davis's Dog	Tau	ast	5.0	042109	214809
R Leporis (Hind's Crimson Star)	Lep	vs	8.2	045936	-144821
M38 (NGC 1912)	Aur	oc	6.4	052842	355117
M42 (NGC 1976, The Great Orion Nebula)	Ori	en	4.0	053517	-052325
M36 (NGC 1960)	Aur	oc	6.0	053617	340826
σ Orionis	Ori	ms	3.8	053845	-023553
M37 (NGC 2099)	Aur	oc	5.6	055218	323310
M35 (NGC 2168)	Gem	oc	5.1	060900	242100
M41 (NGC 2287)	CMa	oc	4.5	064559	-204515
M47 (NGC 2422)	Pup	oc	4.4	073634	-142846
M46 (NGC 2437)	Pup	oc	6.1	074146	-144836
M44 (NGC 2632, Praesepe, the Beehive Cluster)	Cnc	oc	3.1	083957	194020
M67 (NGC 2682)	Cnc	oc	6.9	085124	114900
M81 (NGC 3031)	UMa	gal	7.8	095533	690401
M82 (NGC 3034)	UMa	gal	9.2	095554	694059
M95 (NGC 3351)	Leo	gal	10.6	104357	114211
M96 (NGC 3368)	Leo	gal	10.1	104645	114912
M105 (NGC 3379)	Leo	gal	10.5	104749	123449
M65 (NGC 3623)	Leo	gal	10.1	111855	130526
M66 (NGC 3627)	Leo	gal	9.7	112015	125924
Melotte 111	Com	oc	1.8	122430	260122
NGC 4565 (Berenice's Hair Clip)	Com	gal	9.9	123620	255914
μ Cep (Herschel's Garnet Star)	Cep	vs	4.0	214330	584648

Double Stars

Binocular Double Stars for February			
		Spectral	**Separation**
Star	**Magnitudes**	**Types**	**(arcsec)**
α Leo	1.4, 8.1	B8, G	176
7 Leo	6.3, 9.3	A0, F8	41
τ Leo	5.0, 7.4	K0, G5	89
δ Cep	4.1, 6.1	F5, A0	41
56 And	5.7, 5.9	K0, K2	128
ΣI 1 And	7.1, 7.3	G5, G5	47
14 Ari	5.0, 7.9	F0, F2	106
62 Eri	5.4, 8.9	B9, B8	67
τ Tau	4.3, 7.0	B5, A0	63
ν Gem	4.1, 8.0	B5, A0	113
ζ Gem	4.0, 7.6	G0, G	101
ι Cnc	4.0, 6.0	G5, A5	31
π-1 Umi	6.6, 7.2	G5, G5	31

Variable Stars

Mira-type stars near predicted maximum (mag < +7.5)		
Star	**Mag Range**	**Period (days)**
χ Cyg	3.3-10.2	408.5

Selection of binocular variables (mag < +7.5)			
Star	**Mag Range**	**Period**	**Type**
AA Cam	7.5-8.8	Irreg	Irregular
RX Lep	5.4-7.4	Irreg	Irregular
TW Peg	7.0-9.2	ca. 90d	Semi-regular
U Cep	6.8-9.2	2.5d (increasing)	Eclipsing binary
T Cep	6.0-10.3	388d	Mira
SS Cep	6.7-7.8	ca. 190d	Semi-regular
RZ Cas	6.2-7.7	1.195d	Eclipsing binary

The Solar System

(Low resolution charts may be "clicky" for higher resolution alternatives)

The Moon

February 04	Last Quarter
February 11	New Moon
February 19	First Quarter
February 27	Full Moon

Lunar Occultations

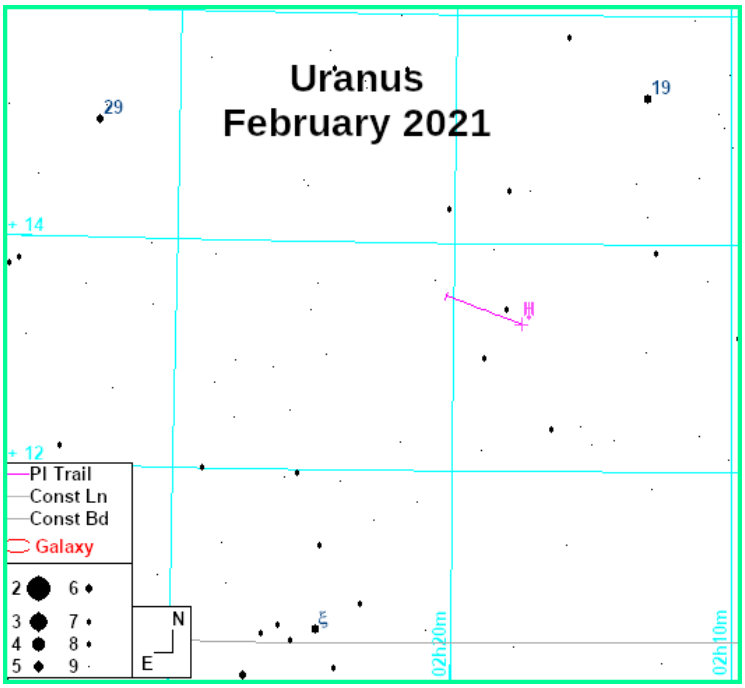
Data are for my location and may vary by several minutes for other UK locations. The phases are (**D**)isappearance, (**R**)eappearance and (**Gr**)aze; they are dark-limb events unless the Cusp Angle is negative.

Lunar Occultations February 2021 50.9°N 1.8°W

Date	Time (UT)	Phase	Star	Spectral Type	Magnitude	Position Angle	Cusp Angle
Feb 01	01:35:37	R	nu Vir	M0	4.0	304	74N
Feb 04	03:07:57	R	HIP 70452	F4	6.3	266	68S
Feb 17	19:18:09	D	xi Ari	B7	5.5	53	70N
Feb 17	20:33:27	D	VW Ari	F0	6.7	116	47S
Feb 22	20:14:05	D	HIP 31650	A3	6.5	103	82S
Feb 22	21:00:01	D	HIP 31730	A5	6.8	142	43S
Feb 22	21:28:48	D	HIP 31850	F8	6.4	101	84S
Feb 23	00:47:45	D	HIP 32369	K2	7.0	59	53N
Feb 23	23:15:38	D	HIP 37269	A2	6.2	45	33N
Feb 25	02:40:27	D	gam Cnc	A1	4.7	112	89S

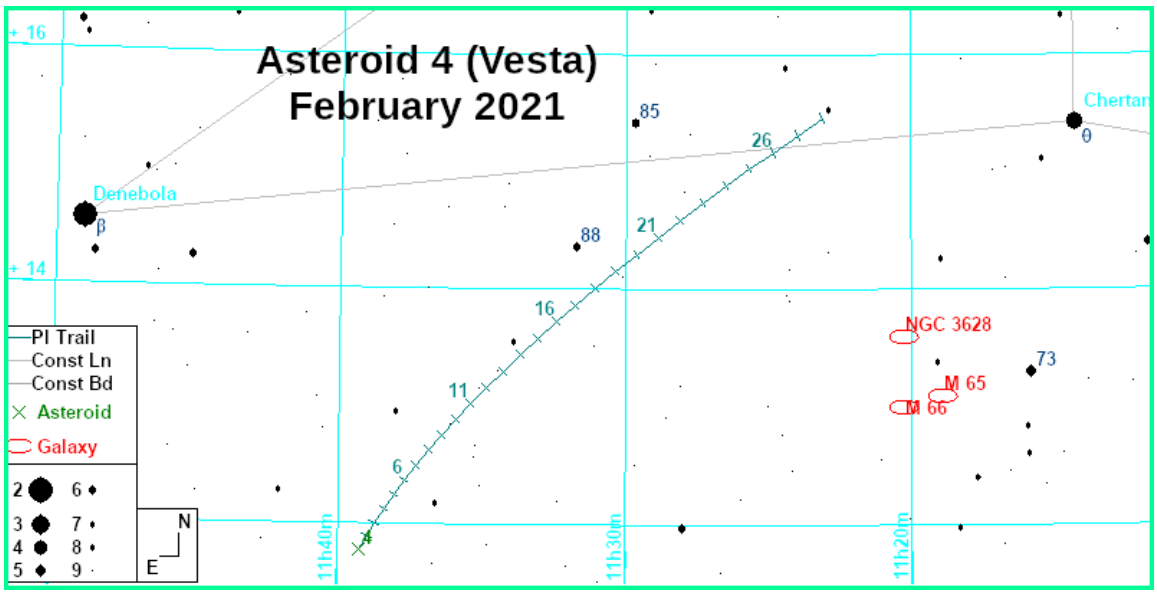
Planets

Uranus (mag +5.7) is now an evening object in Aries, mid-way between *19* and *ξ Arietis*; it moves less than a degree during the month, but is a magnitude brighter than anything within a couple of degrees of it so should be easy to identify.



Asteroids

Asteroid 4 (Vesta) starts the month in the same 10x50 field of view as *ι Leonis*. It brightens from mag. +6.7 to +6.1 as it tracks northwest over the course of the month.



Dark Skies Festivals

Two of Britain's Dark Sky places are holding online festivals in the coming weeks (click on the images for more info) to celebrate the potential of dark skies, and not jst from ans astronomical perspective. The first is Cumbria:

The second, close to my heart since I am one of the organisers, is Cranborne Chase AONB International Dark Sky Reserve:

Public Outreach & Talks

If you're at any of these, do give me a virtual "wave". Dates are UT.

Jan 31st	Elan Valley Dark Sky Festival	**A Beginners' Guide to Choosing and Using Binoculars for Astronomy**
Feb 4th	Turton Rotary Club	**Seven Ways the Universe Tries to Kill You**
Feb 8th	Cranbrook and District Science and Astronomy Society	**Cranbrook and District Science and Astronomy Society**
Feb 9th	Aberdeen AS	**Fuzzy Blobs: a Guide for the Perplexed**
Feb 15th	Cranborne Chase AONB International Dark Sky Reserve StarFest	**Stargazing: An Introduction and Beginners' Guide**
Feb 16th	Fordingbridge Astronomers	**Fuzzy Blobs: a Guide for the Perplexed**
Feb 18th	Cranborne Chase AONB International Dark Sky Reserve StarFest	**Ask Our Astronomer (Facebook Livestream Q&A)**
Feb 19th	Cranborne Chase AONB International Dark Sky Reserve StarFest	**Choosing Your First Astronomical Telescope**
Feb 24th	Letchworth and District AS	**Two Eyes Are better than One**

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

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 – 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.

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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