The Binocular Sky Newsletter

No. 110
January 2021

Introduction

Happy New Year!

At the time of writing, vaccines against the SARS-CoV-2 virus are becoming globally available and affordable. This makes me feel as though things are changing for the better, and that just maybe we'll start to see the beginning of the end of these weird times during 2021!

As most of you know, my intention here is to highlight some of the best astronomical targets for binoculars (and small telescopes!) for the coming month. Although it is primarily intended for observers in the UK, nearly all the objects can be seen from anywhere north of latitude 30°N, and many of them from anywhere in the southern hemisphere.

In the Solar System, we're losing Neptune, but gaining the brighter, and far better placed, Vesta, and have a meteor shower renowned for its fireballs.

January mornings bring a return of one of my favourite bits of sky: the Virgo-Coma region of galaxies.

January also brings a personal "first": my first international Zoom talk – on binocular astronomy, of course! On the 23rd (my time; 22nd theirs) my appalling sense of humour goes transatlantic.

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The Deep Sky

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

Two marvellous binocular targets, the *Pleiades* (M45) and Collinder 70 (which too few people spend time with in their haste to get to the Great Orion Nebula) culminate in the early evening, as do the trio of open clusters in Auriga and M35 in Gemini. While you're in the Orion region, have a look at the stars Betelgeuse and Sirius. In the Classical Greek era, they were described as yellow and red respectively!

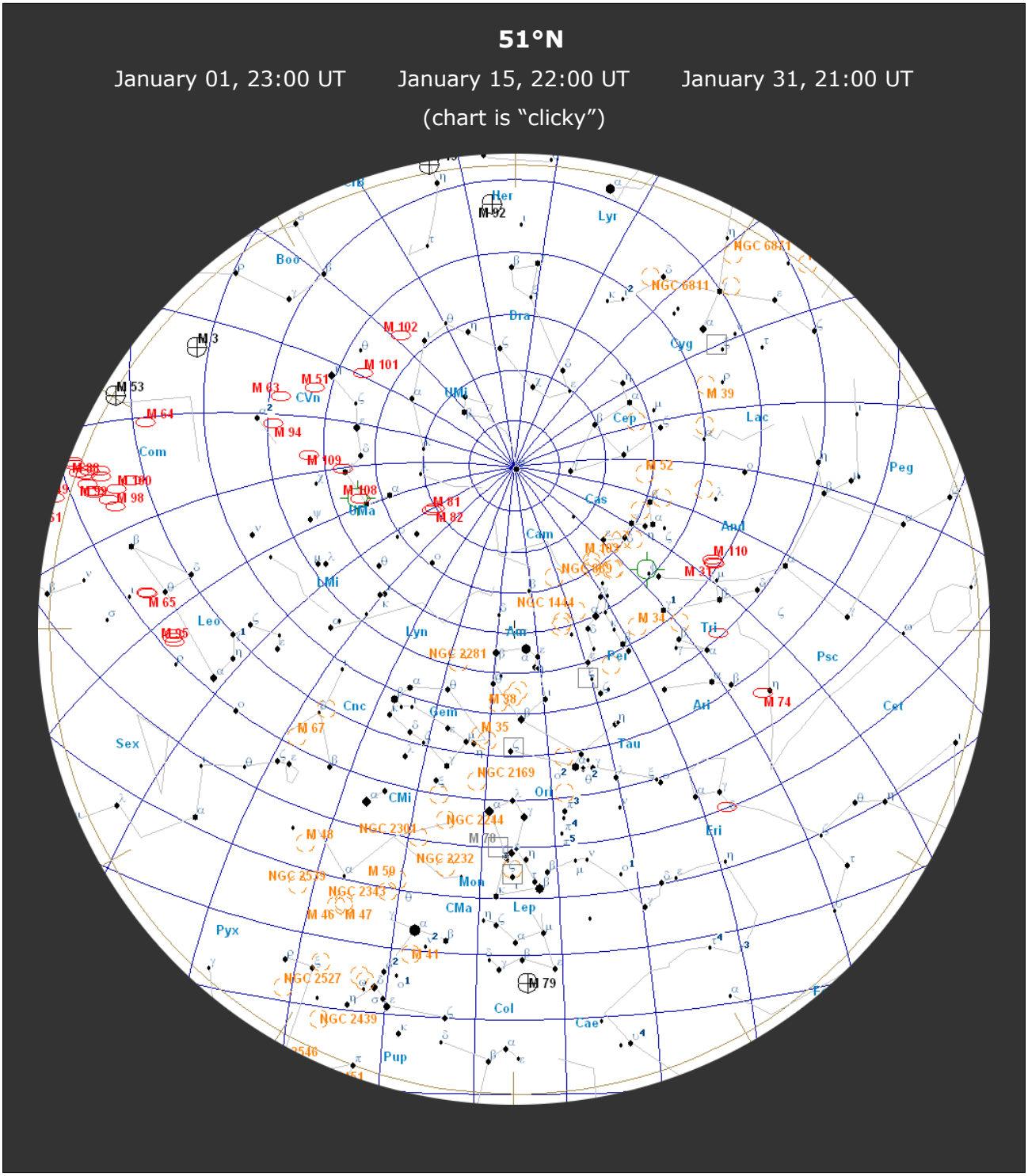
While you are looking at M35, also see if you can identify two smaller open clusters, NGC 2158, which is half a degree to the SE, and the slightly more difficult IC 2157, which is a degree to the ESE. Also high enough to be comfortably observed are M44 (*Praesepe*) and M67 , two fine open clusters in Cancer. Just above M44 youwill find the close (for binoculars) double star iota Cancri. Lower in the southern sky are more open clusters: M46, M47 and, near Sirius, M41.

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.

The rather indistinct open cluster NGC1502, is brought to prominence by an asterism named Kemble's Cascade, in honour of Fr. Lucian Kemble, a Canadian amateur astronomer and Franciscan friar, who discovered it with a 7x35 binocular. He described as "*a beautiful cascade of faint stars tumbling from the northwest down to the open cluster NGC 1502*." It is one of the most pleasing objects in small and medium binoculars.

In January, the Milky Way is overhead in the mid-to-late evening, which is why so many open clusters are on view (see the chart). We need to look away from the plane of our galaxy to see other galaxies, but The *Great Andromeda Galaxy*, M31 and M33 (*The Pinwheel*) are both close to the plane of the Milky Way so are worth observing in January evenings. M31 in particular is very easily visible this month and is a

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.



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). M33 has a low surface-brightness and therefore benefits from lower magnification. This generally makes it easier to see in, say, a 10x50 binocular than in many "starter" telescopes.

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 as they too appear quite close to the galactic plane. We can use these to demonstrate the effects of averted vision: acquire both galaxies in the same field of view; look at M81 and notice (without gazing back at it) what happens to M82: it seems to brighten and glow slightly. When you look directly at M82, it fades and M81 brightens. If you're not used to using averted vision, practice it a bit – it'll come in handy with the next object.

We can try it on M1, the Crab Nebula supernova remnant. Identify *ζ Tau*; M1 is slightly more than 1° NW (towards *El Nath, β Tau*). Put *ζ* just SE of centre-field and concentrate your gaze on it – a small dim patch of slightly brighter sky should just make itself apparent. You may need to experiment a bit with the best place to direct your gaze but, if the sky is dark and transparent, 10x50 should be sufficient although, of course, more aperture and magnification will make it easier.

If you are up around midnight (or later) it is worth looking out for the galaxy trios in Leo (M95/96/105 and M65/66/NGC3628) and Markarian's Chain in Coma Berenices. This latter group is part of the Virgo-Coma cluster of galaxies and we can use averted vision to good effect here as well. I find 70mm binoculars ideal for this. Find one of the brighter galaxies in the group and centre your gaze on it. Notice the other fainter galaxies that exist around it. Now look directly at one of the fainter ones – notice how it disappears. Try not to get too frustrated by this if you are trying to count galaxies!

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 Berenices its name.

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

January 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
M33 (NGC 598, the Pinwheel Galaxy)	Tri	gal	6.2	013351	303929
M45 (the Pleiades)	Tau	oc	1.6	034729	240619
Kemble's Cascade	Cam	ast	9.0	035752	630711
M38 (NGC 1912)	Aur	oc	6.4	052842	355117
M1 (NGC 1952, the Crab Nebula, SN1054)	Tau	snr	8.4	053431	220051
M42 (NGC 1976, The Great Orion Nebula)	Ori	en	4.0	053517	-052325
Collinder 70	Ori	oc	0.4	053532	-010407
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
IC 2157	Gem	oc	8.4	060451	240358
NGC 2158	Gem	oc	8.6	060726	240546
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
iota Cancri	Cnc	ms	4.0	091110	282426
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
NGC 3628	Leo	gal	10.4	112016	133522
Melotte 111	Com	oc	1.8	122430	260122
Markarian's Chain	Vir	gal	9.9	122611	125647
NGC 4565 (Berenice's Hair Clip)	Com	gal	9.9	123620	255914

Double Stars

Binocular Double Stars for January			
Star	**Magnitudes**	**Spectral Types**	**Separation (arcsec)**
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
p-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)**
UV Aur	7.3 – 11.1	393.7

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
U Cep	6.8-9.2	2.5d (increasing)	Eclipsing binary
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

January 06	Last Quarter
January 13	New Moon
January 20	First Quarter
January 28	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.

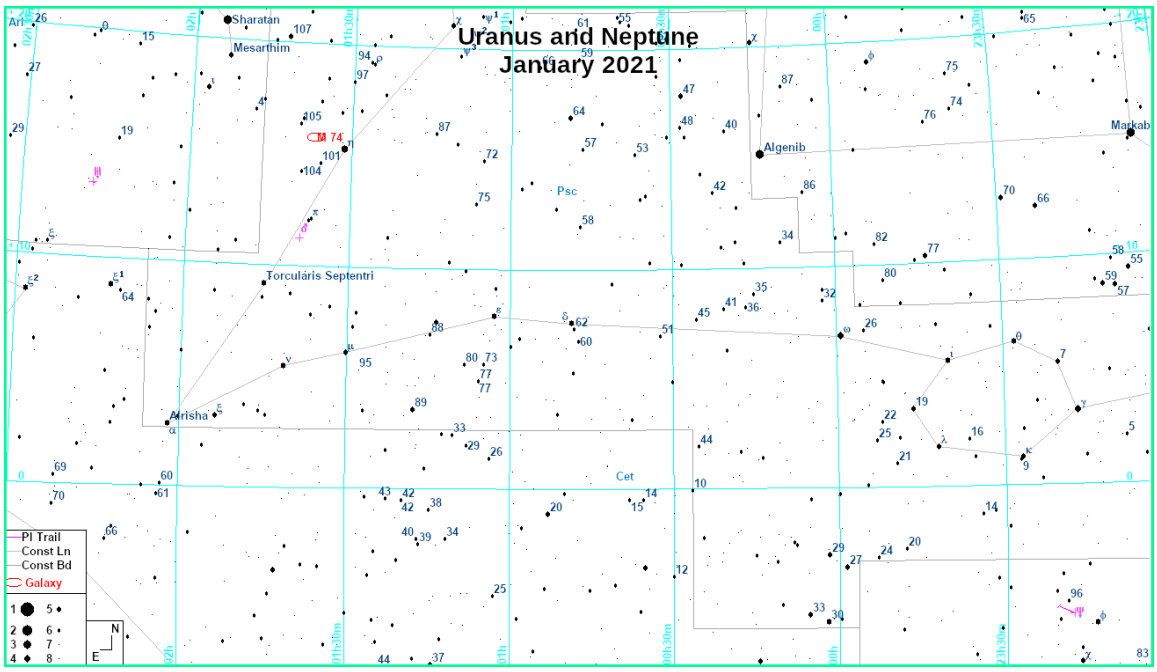
Lunar Occultations December 2020 50.9°N 1.8°W

Date	Time (UT)	Phase	Star	Spectral Type	Magnitude	Position Angle	Cusp Angle
Jan 03	05:28:59	R	42 Leo	A1	6.2	311	67N
Jan 07	06:46:43	R	HIP 67578	K0	6.9	311	70N
Jan 18	19:40:05	D	HIP 2323	K2	6.9	90	69S
Jan 19	19:28:11	D	35 Cet	F8	6.6	8	29N
Jan 21	21:57:11	D	38 Ari	A7	5.2	39	57N
Jan 26	01:12:03	D	5 Gem	K0	5.8	11	9N
Jan 26	03:13:45	D	8 Gem	G8	6.1	127	56S
Jan 26	21:47:00	D	ome Gem	G5	5.2	161	30S
Jan 27	00:31:56	D	HIP 34351	M1	6.7	152	39S
Jan 27	02:59:40	D	48 Gem	F5	5.9	115	77S
Jan 30	05:37:36	R	HIP 49445	F2	6.4	235	47S

Planets

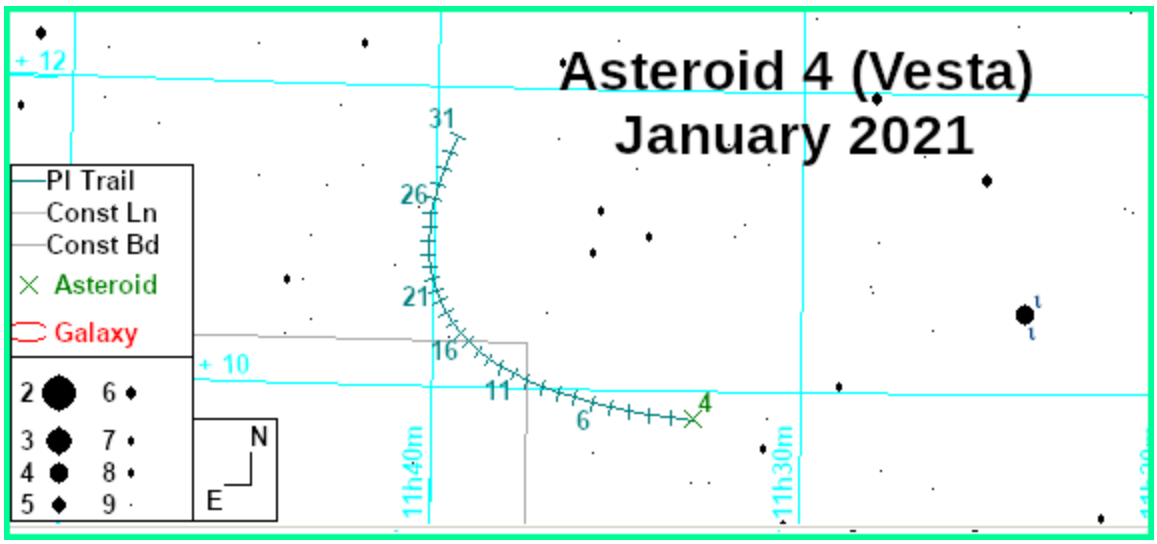
Uranus (mag +5.7) is now an evening object in Aries, mid-way between *19* and *ξ Arietis*; it only moves a few arcminutes during the month, but is a magnitude brighter than anything within a couple of degrees of it so should

be easy to identify. **Neptune** (mag +7.9) is getting quite difficult now, and you must look early in the evening, early in the month. It starts the month a degree northeast of *φ Aquarii*; it moves another degree further away during the month.



Asteroids

Asteroid 4 (Vesta) is now a binocular object in Leo, in the same 10x50 field of view as *ι Leonis*. It brightens from magn. +7.3 to +6.7 over the course of the month.



Meteor Showers

The **Quadrantids** are the first meteor shower of the year, but unfortunately they coincide with a gibbous Moon. The shower has its narrow (6 hour) peak predicted for the afternoon of the 3rd, with a ZHR of 110 (but don't expect to see more than about 15 per hour). Most meteors are due to debris left by comets, but the Quadrantid shower is one of two (the other is the Geminid shower, which was active last month) that originates from an asteroid, in this case asteroid **2003 EH**. You can use binoculars to examine the persistence of any ionisation trains from any fireballs – the normal-brightness meteors of this shower tend not to leave persistent trains, but the shower often produces several fireballs.

Public Outreach & Talks

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

Jan 23rd (22nd CST)	Texas AS	**Two Eyes Are better than One**
Jan 26th	Mansfield and Sutton AS	**Two Eyes Are better than One**
Jan 28th	Basingstoke AS	**Two Eyes Are better than One**
Jan 31st	Elan Valley Dark Sky Festival	**A Beginners' Guide to Choosing and Using Binoculars for Astronomy**

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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