




The Binocular Sky

December
2013

Newsletter

Introduction

Welcome to the ***Binocular Sky*** Newsletter of December 2013. The intention of this monthly offering is to highlight some of the binocular targets for the coming month. It is primarily targeted at observers in the UK, but should have some usefulness for observers anywhere north of Latitude 30°N and possibly even further south. For this Newsletter to be a useful tool, it needs to have the information that **YOU** want in it; therefore please do not be shy about making requests – if I can accommodate your wishes, I shall do so.

If you would like me to email this newsletter to you each month, please complete and submit the [subscription form](#). You can get “between the newsletters” alerts, etc. via  and .

The Deep Sky (*Hyperlinks take you to charts and more information*)

December marks the welcome return of the [Pleiades \(M45\)](#) and the [Great Orion Nebula \(M42\)](#) to early evening observation at a reasonable altitude. The [trio of open clusters in Auriga](#) and [M35](#) in Gemini are also worth observing. 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. Nearer the Pleiades is [NGC 1647](#), which is within the 'V' asterism of the [Hyades](#). It is a sparse cluster and, although it is visible in a 10x50 binocular, it really benefits from a little more

aperture and magnification.

The open cluster [NGC 752](#) is very well placed this month; it is one of those objects that is often overlooked because of its proximity to a more famous object, in this case, the Great Andromeda Galaxy (see below). NGC 752 is a very fine cluster, and easy in 50mm binoculars in which it begins to resolve. Nearby towards Perseus is another fine cluster, [M34](#).

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.

In December, the Milky Way is overhead in the mid-to-late evening. This means that those objects (globular clusters and galaxies) that are outside our galaxy are not as well placed for observation as they are when the Milky Way is low in the sky. Although the bright [M81 \(Bode's Nebula\)](#) and [M82 \(The Cigar Galaxy\)](#), are still relatively easy to observe, even in a 50mm binocular, their altitude is such that you are unlikely to get neck-strain when you do so with straight-through binoculars. M81 and M82 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.

Two notable exceptions to the generalisation of galaxies being poorly placed on December evenings are [The Great Andromeda Galaxy](#), [M31](#) and [M33 \(The Pinwheel\)](#), both of which are close to the plane of the Milky Way. M31 in particular is very easily visible this month and is 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). 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.

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 ancestors of the genus Homo were just evolving!

Of the globular clusters, M15 and M2 are both well placed for observation in December.

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. They are important for two reasons: Firstly, they contain some of the oldest stars in the galaxy, so studying them helps us understand the evolution of stars. Secondly, they are useful as "standard candles" in establishing a distance scale of the Universe, based on the assumption that the brightest stars in any globular cluster will be approximately the same brightness and that the brightest globulars in a galaxy will be approximately the same brightness.

Variable Stars

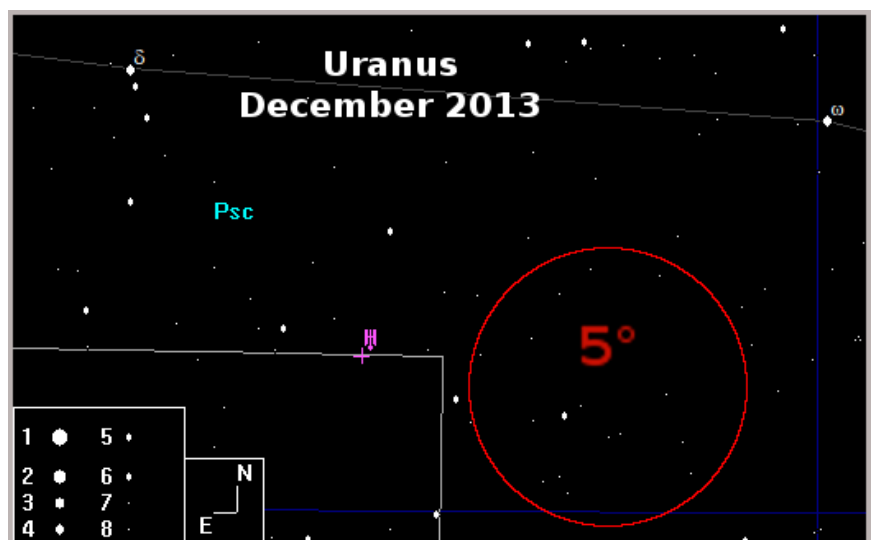
Mira-type stars near predicted maximum (mag < +8.5)		
Star	Mag Range	Period (days)
W And	7.4-13.7	396
V CrB	7.5-11.0	358
W CrB	8.5-13.5	238
RU Her	8.0-13.0	485

Selection of binocular variables (mag < +8.5)			
Star	Mag Range	Period	Type
XY Lyr	5.8-6.4	Irreg	Irregular
R Sge	8.0-10.4	71d	RV Tauri
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
U Del	7.0-8.0	ca. 110d	Irregular
V Aqr	7.6-9.4	ca. 244d	Semi-regular
TW Peg	7.0-9.2	ca. 90d	Semi-regular
U Cep	6.8-9.2	2.5d (increasing)	Eclipsing binary
EK Cep	8.2-9.5	4.3d	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

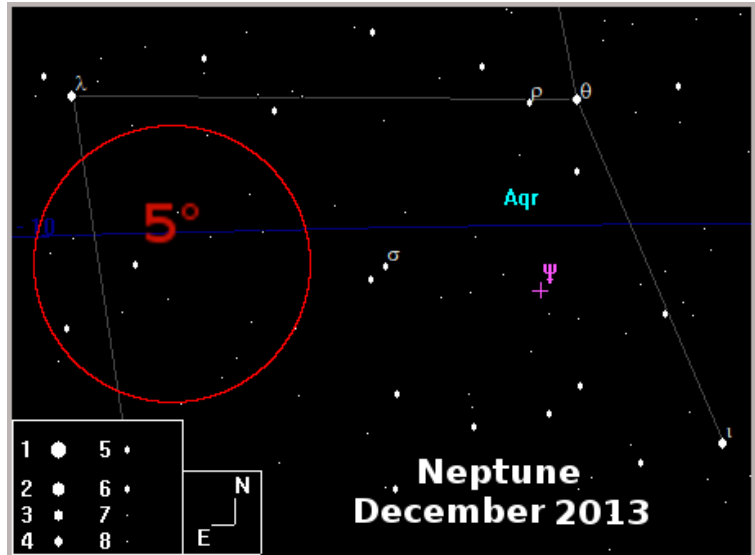
The Solar System

Binocular Planets

Uranus is at magnitude +5.8 and spends the month just over 5.5° south-southwest of δ Psc. By mid-month it transits before midnight, so observe it early in the evening.

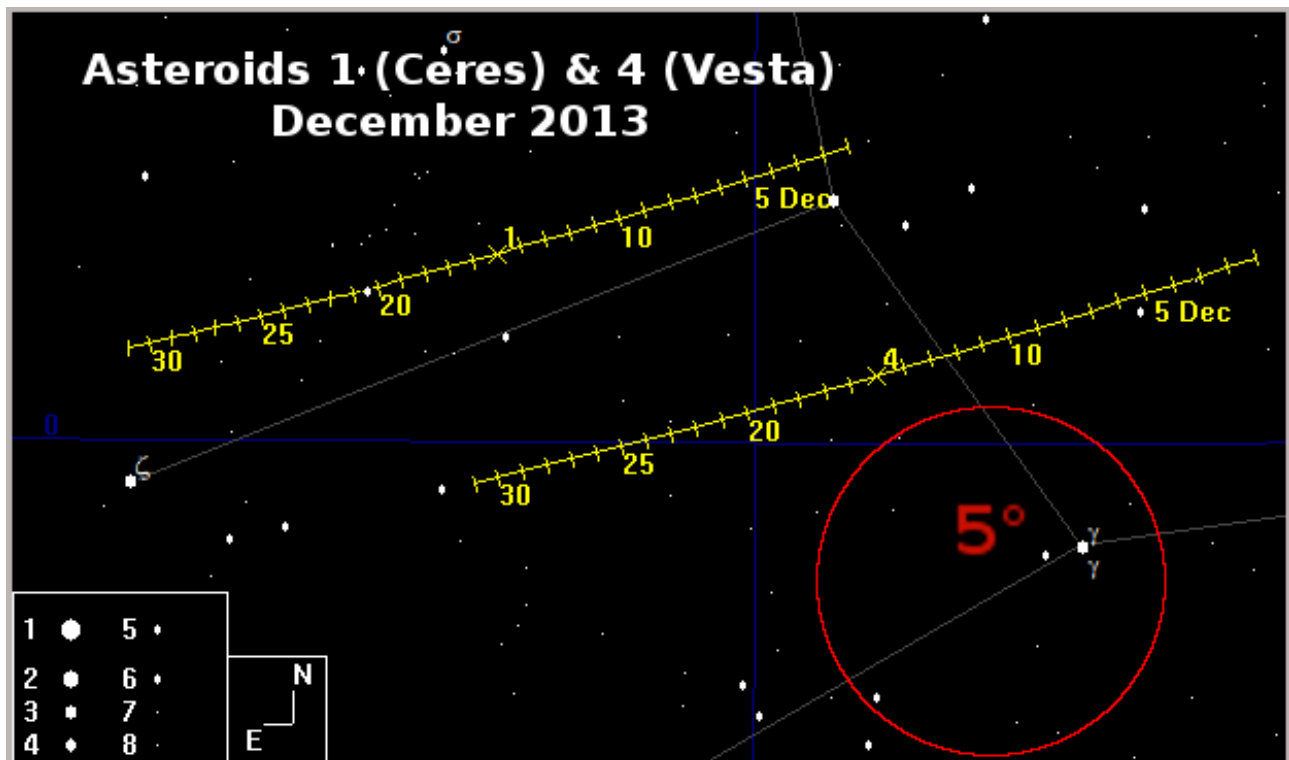


Neptune spends the month 2.5° west of σ Aqr, but is much fainter at magnitude +7.9. It sets before midnight, so observe it early in the evening



Minor Planets

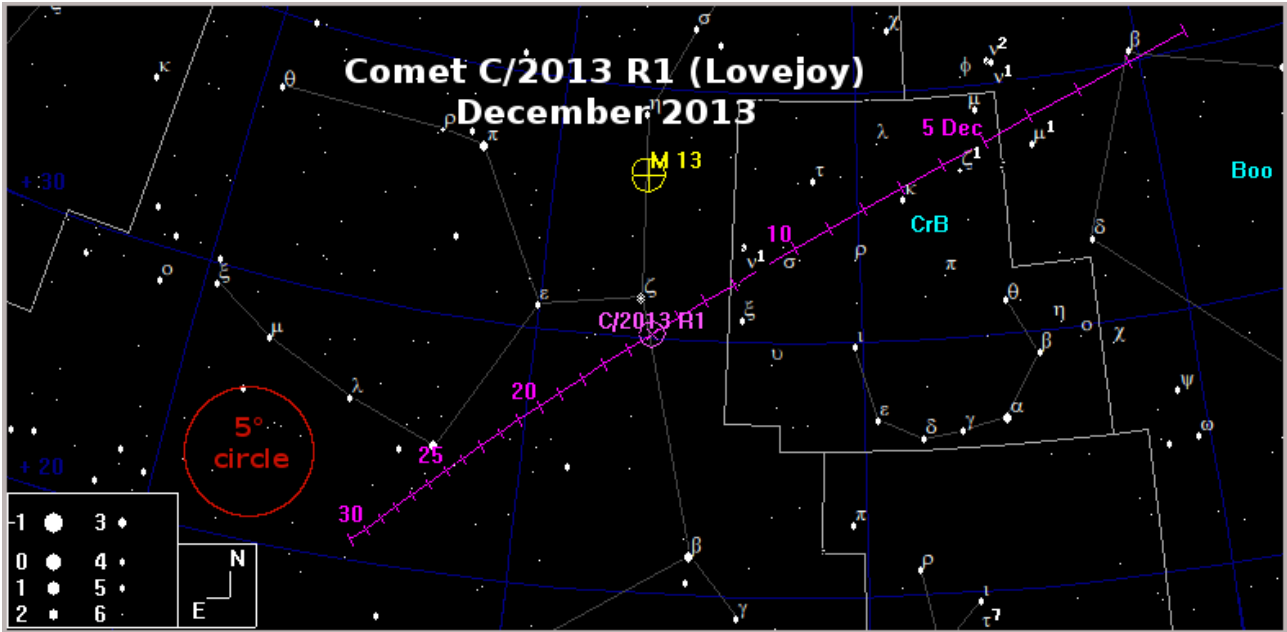
Asteroids 1 (Ceres) and **4 (Vesta)** are dawn objects in Virgo, visible before 03:00 at magnitudes +8.8 and +7.9 respectively.



Comets

At the time of writing, **Comet C/2012 (ISON)** had just passed perihelion and its future was uncertain. It has been disrupted to some extent and it is no longer certain if it has an intact nucleus.

Comet **C/2013 R1 (Lovejoy)** is now the brightest comet in our sky, currently at naked-eye visibility, and is well-placed all month.



Lunar Occultations, December 2013, 50.9°N, 1.8°W						
Date	Time	Const	SAO	Mag	Type	PA (°)
Dec 08	17:32:33	Aqr	146045	7.7	D	081
Dec 08	19:19:16	Aqr	146072	8.5	D	125
Dec 09	18:35:42	Cet	146600	6.9	D	089
Dec 10	19:37:32	Psc	109026	8.0	D	051
Dec 11	00:12:26	Psc	109094	7.1	D	048
Dec 11	19:09:12	Psc	109560	7.9	D	042
Dec 11	21:29:48	Psc	109603	8.1	D	026
Dec 11	21:45:46	Psc	109614	7.6	D	068
Dec 11	22:14:47	Psc	109627	4.3	D	096
Dec 11	23:52:40	Psc	109661	7.9	D	048
Dec 12	00:27:55	Psc	109677	6.9	D	063
Dec 13	02:07:52	Ari	92739	6.1	D	027
Dec 13	18:13:56	Ari	93030	8.0	D	100
Dec 13	23:51:13	Ari	93094	7.9	D	053
Dec 14	00:41:18	Ari	93111	8.5	D	116
Dec 14	02:39:31	Ari	93144	5.5	D	087
Dec 14	17:37:45	Tau	93441	8.1	D	062
Dec 14	18:44:53	Tau	93454	7.1	D	071
Dec 15	02:43:07	Tau	93561	7.1	D	082
Dec 19	06:43:33	Gem	96611	6.5	R	312
Dec 19	22:17:12	Gem	97243	8.2	R	271
Dec 20	01:56:40	Gem	97330	8.0	R	310
Dec 20	04:43:02	Cnc	97397	8.4	R	285
Dec 21	06:01:27	Cnc	98117	5.9	R	323
Dec 22	00:09:50	Leo	117675	8.4	R	285
Dec 22	02:28:41	Leo	117717	5.5	R	258
Dec 22	22:42:07	Sex	118135	6.6	R	329
Dec 23	01:48:48	Sex	118181	7.8	R	356
Dec 23	04:11:07	Sex	118204	8.3	R	349
Dec 24	01:02:12	Leo	118598	7.9	R	290
Dec 25	03:29:52	Vir	138428	9.0	R	316
Dec 26	06:19:13	Vir	138920	6.8	R	290
Dec 27	07:04:10	Vir	158011	7.1	R	302
Dec 28	04:49:40	Lib	158548	7.9	R	303
Dec 28	04:50:19	Lib	158543	8.3	R	285
Dec 09	17:32:34	Aqr	146046	8.7	D	082

There are several occultations of stars brighter than mag +8.5 visible from the UK this month. Times and Position Angles are for my location (approx: 50.9N, 1.8W) and will vary by up to several minutes for other UK locations. The types are **(D)**isappearance, **(R)**eappearance and **(G)**raze; they are all dark-limb events unless there is a **(B)**. I have given the SAO numbers of stars on the assumption that most readers will find this more useful than ZC (Zodiac Catalogue) numbers.

Meteor Showers

The major meteor shower in December is the normally very reliable Geminids. A waxing gibbous Moon interferes most of the night of the maximum (13th/14th) but sets about an hour before the time of predicted peak activity (times for New Forest):

Moonset – 04:57

Predicted maximum – 05:45(ZHR = 120)

Nautical Twilight – 06:41

The Moon

Dec 03	New Moon
Dec 09	First Quarter
Dec 17	Full Moon
Dec 25	Last Quarter

Wishing you Clear Dark Skies,

Steve Tonkin for The Binocular Sky



Acknowledgments:

Charts and occultation tracks prepared with Guide v9.0 from <http://projectpluto.com>

Lunar occultation data produced with David Herald's [Occult v4.1.0](#)

Variable star data from David Levy's [Observing Variable Stars](#)

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