Introduction

Welcome, especially to new readers, to May’s Binocular Sky Newsletter. The intention of this monthly offering is to highlight some of the binocular targets for the coming month. It is primarily targeted at binocular observers (although I know that many small-scope observers use it as well) in the UK, but should have some usefulness for observers anywhere north of Latitude 30°N and possibly even further south.

Highlights this month include the return of Neptune to the morning sky.

If you would like to receive this newsletter automatically each month, please complete and submit the subscription form. You can get “between the newsletters” alerts, etc. via Facebook and Twitter.

The Deep Sky

(Hyperlinks will take you to finder charts and more information about the object.)

The trio of open clusters in Auriga and M35 in Gemini are still visible low in the West as twilight darkens. 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 somewhat more difficult IC 2157, which is a degree to the ESE. Also in the West, but slightly higher are M44 (Praesepe) and M67, two fine open clusters in Cancer. Also visible in the North are NGC 457 (The Owl Cluster) and NGC 633 in Cassiopeia and the Perseus Double Cluster. The finest and best-placed open cluster available this month is Melotte 111, the cluster that gives Coma Berenices its name.

Open (also called 'Galactic') Clusters are loosely packed groups of stars that are
gravitationally bound together; they may contain from a few dozens to a few thousand stars which recently formed in the galactic disk.

In May, 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. Look out for the two galaxy trios in Leo (M95/96/105 and M65/66/NGC3628) which are now moving into the western sky, and Markarian's Chain in Coma Berenices, which is very well placed as we enter
astronomical twilight. If you have a big binocular, also observe the edge-on NGC4565 (Berenice's Hair Clip), which is next to Melotte 111. Also very well placed this month are M81 (Bode's Nebula) and M82 (The Cigar Galaxy), both of which are easy in a 50mm binocular. 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 very difficult owing to its low surface brightness.

Of the globular clusters, M3 is a good one to start with during a May evening’s observing. Later in the evening, the two Hercules globulars, M92 and the very impressive and very easy to find M13 are at a better altitude for observation. Although M13 is clearly larger than M3, it is easier to resolve the outer stars of the latter one. Also becoming visible in May evenings is M5 in Serpens.

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 assumptions 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.

If you have binoculars of at least 100mm aperture, see if you can find and identify NGC 4361, a planetary nebula in Corvus. It is a difficult object because it is low in the sky, even from southern Britain.

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 planets.

For interactive maps of Deep Sky Objects visible from 51°N, please visit: http://binocularsky.com/map_select.php
**Variable Stars**

<table>
<thead>
<tr>
<th>Star</th>
<th>Mag Range</th>
<th>Period</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA Cam</td>
<td>7.5-8.8</td>
<td>Irreg</td>
<td>Irregular</td>
</tr>
<tr>
<td>Y Lyn</td>
<td>7.2-7.8</td>
<td>110d</td>
<td>Semi-regular</td>
</tr>
<tr>
<td>U Cep</td>
<td>6.8-9.2</td>
<td>2.5d (increasing)</td>
<td>Eclipsing binary</td>
</tr>
<tr>
<td>V1010 Oph</td>
<td>6.1-7</td>
<td>0.66d</td>
<td>Eclipsing binary</td>
</tr>
<tr>
<td>RR Lyr</td>
<td>7.0-8.12</td>
<td>0.57d</td>
<td>RR Lyr</td>
</tr>
<tr>
<td>TX UMa</td>
<td>7.0-8.8</td>
<td>3.06d</td>
<td>Eclipsing binary</td>
</tr>
</tbody>
</table>

**Double Stars**

<table>
<thead>
<tr>
<th>Star</th>
<th>Magnitudes</th>
<th>Types</th>
<th>Separation</th>
</tr>
</thead>
<tbody>
<tr>
<td>67 Oph</td>
<td>4.0, 8.1</td>
<td>B5, A</td>
<td>54</td>
</tr>
<tr>
<td>ρ Oph</td>
<td>5.0, 7.3, 7.5</td>
<td>B5, A, B3</td>
<td>151, 157</td>
</tr>
<tr>
<td>53 Oph</td>
<td>5.7, 7.4</td>
<td>A2, F</td>
<td>41</td>
</tr>
<tr>
<td>δ Cep</td>
<td>4.1, 6.1</td>
<td>F5, A0</td>
<td>41</td>
</tr>
<tr>
<td>γ Her</td>
<td>3.7, 9.4</td>
<td>F0, K</td>
<td>43</td>
</tr>
<tr>
<td>ν Boo</td>
<td>5.0, 5.0</td>
<td>K5, A2</td>
<td>628</td>
</tr>
<tr>
<td>DN &amp; 65 UMa</td>
<td>6.7, 7.0,</td>
<td>A3, B9</td>
<td>63</td>
</tr>
<tr>
<td>σ-1 Umi</td>
<td>6.6, 7.2</td>
<td>G5, G5</td>
<td>31</td>
</tr>
<tr>
<td>ν Dra</td>
<td>4.9, 4.9</td>
<td>A5, A5</td>
<td>62</td>
</tr>
<tr>
<td>39 Dra</td>
<td>5.1, 7.9</td>
<td>A2, F8</td>
<td>89</td>
</tr>
</tbody>
</table>

**The Solar System**

**Neptune** returns (just!) to the morning sky by the end of the month, shining at mag. +7.9 midway between two reddish stars, λ and φ Aqr.

**Comet 2015 ER 61 (PanSTARRS)** has brightened more than expected and is now around 7th magnitude, but may fade briefly before brightening again as it nears perihelion. It is a difficult morning object, in the same part of the sky as Venus (at the beginning of the month) and Neptune.
**Asteroid 4 (Vesta)** passes just north of the Beehive Cluster (M44). Both the 8th magnitude asteroid and the cluster will fit in a 10x50 binocular field from about mid-month.
Asteroid Occultations
There are no predicted asteroid occultations of stars visible from the UK and suitable for binoculars (mag. < +7.5) this month.

Lunar Occultations
There are several occultations of stars brighter than mag +7.0 visible from the UK this month. Data are for my location and may vary by several minutes for other UK locations. The types are (D)isappearance, (R)eappearance and (Gr)raze; they are all dark-limb events.

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Phase</th>
<th>Star</th>
<th>Spectrum</th>
<th>Magnitude</th>
<th>Cusp Angle</th>
<th>Position Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 03</td>
<td>20:19:11</td>
<td>D</td>
<td>HIP 47291</td>
<td>G8</td>
<td>6.7</td>
<td>84N</td>
<td>102</td>
</tr>
<tr>
<td>May 04</td>
<td>00:59:35</td>
<td>D</td>
<td>18 Leo</td>
<td>K4</td>
<td>5.7</td>
<td>48S</td>
<td>151</td>
</tr>
<tr>
<td>May 04</td>
<td>23:20:14</td>
<td>D</td>
<td>49 Leo</td>
<td>A2</td>
<td>5.6</td>
<td>76S</td>
<td>126</td>
</tr>
<tr>
<td>May 07</td>
<td>23:54:30</td>
<td>D</td>
<td>46 Vir</td>
<td>K2</td>
<td>6.2</td>
<td>64N</td>
<td>91</td>
</tr>
<tr>
<td>May 08</td>
<td>02:06:56</td>
<td>D</td>
<td>48 Vir</td>
<td>F0</td>
<td>6.7</td>
<td>50N</td>
<td>77</td>
</tr>
<tr>
<td>May 13</td>
<td>02:54:45</td>
<td>R</td>
<td>29 Oph</td>
<td>K1</td>
<td>6.3</td>
<td>84S</td>
<td>260</td>
</tr>
<tr>
<td>May 15</td>
<td>00:59:46</td>
<td>R</td>
<td>HIP 91527</td>
<td>A8</td>
<td>6.7</td>
<td>70N</td>
<td>283</td>
</tr>
<tr>
<td>May 28</td>
<td>21:05:49</td>
<td>D</td>
<td>HIP 36060</td>
<td>G5</td>
<td>6.9</td>
<td>74N</td>
<td>87</td>
</tr>
</tbody>
</table>

The Moon
- May 03  First Quarter
- May 10  Full Moon
- May 19  Last Quarter
- May 25  New Moon

Meteors
The Eta Aquarids peak on the 6th (ZHR = 55/hr). The gibbous Moon will still be up at the onset of nautical twilight, but at least it will be the other side of the sky. The meteors are grains of dust that were left in the wake of Comet Halley. As these particles enter the atmosphere, they compress and heat the air in front of them. This heat causes the surface of the particle to ablate and ionise. Binoculars are useful for observing the persistence of these ionisation trains that form the streak in the sky which is what we observe as a “shooting star”.
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 my book, Binocular Astronomy:
  Click on the image for more information
- Make a purchase via the affiliate links in the Binocular Sky shopfront
- Make a small PayPal donation to newsletter@binocularsky.com

Wishing you Clear Dark Skies,

Steve Tonkin
for

The Binocular Sky

Acknowledgments:
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 David Levy’s Observing Variable Stars
Occultation data derived with Dave Herald’s Occult

Disclosure: Links to Amazon or The Binocular Shop may be affiliate links
© 2017 Stephen Tonkin under a Creative Commons BY-NC-SA License