

## Observation Plan for the month of December 2018

### Moon

<b>New</b>	<b>1<sup>st</sup> Quarter</b>	<b>Full Moon</b>	<b>Last Quarter</b>
<b>7/12/18</b>	<b>15/12/18</b>	<b>22/12/18</b>	<b>29/12/18</b>

### Planets

<b>Planet</b>	<b>Magnitude</b>	<b>Comments</b>
<b>Mercury</b>		<b>Not visible this month</b>
<b>Venus</b>	<b>-4.5</b>	<b>Rising at about 04:00</b>
<b>Mars</b>	<b>0.0</b>	<b>Setting at about 23:00</b>
<b>Jupiter</b>	<b>+0.5</b>	<b>Setting at about 17:00</b>
<b>Saturn</b>		<b>Not visible this month</b>
<b>Uranus</b>	<b>+5.7</b>	<b>Setting at about 03:00</b>
<b>Neptune</b>	<b>+7.9</b>	<b>Setting at about 23:00</b>

### Comets

<b>Name: Stephen-Oterma (38P)</b>	<b>Magnitude</b>	<b>RA</b>	<b>Dec</b>
<b>5<sup>th</sup> of the month</b>	<b>+9.2</b>	<b>8h 16'</b>	<b>+30° 31'</b>
<b>15<sup>th</sup> of the month</b>	<b>+9.4</b>	<b>8h 27'</b>	<b>+34° 36'</b>
<b>25<sup>th</sup> of the month</b>	<b>+9.7</b>	<b>8h 33'</b>	<b>+38° 34'</b>

<b>Name: Wirtanen (46P)</b>	<b>Magnitude</b>	<b>RA</b>	<b>Dec</b>
<b>5<sup>th</sup> of the month</b>	<b>+9.4</b>	<b>2h 51'</b>	<b>-11° 13'</b>
<b>15<sup>th</sup> of the month</b>	<b>+8.8</b>	<b>3h 55'</b>	<b>+19°42'</b>
<b>25<sup>th</sup> of the month</b>	<b>+9.4</b>	<b>5h 48'</b>	<b>+49° 55'</b>

### **Meteor Showers**

<b>Name</b>	<b>Nominal start date</b>	<b>Nominal end date</b>	<b>Peak ZHR</b>	<b>Originating comet</b>	<b>Moon illumination at peak and comments</b>
Geminid	8/12/2017	17/12/2017	100+	3200 Phaethon	18%

### **Deep Sky**

<b>Constellation</b>	<b>Object</b>	<b>RA</b>	<b>Dec</b>	<b>Mag</b>	<b>Type</b>	<b>Dates seen</b>
<b>Andromeda</b>	<b>M110</b>	<b>00h 40'</b>	<b>+41° 23'</b>	<b>+8.9</b>	<b>Galaxy</b>	
<b>Andromeda</b>	<b>M31</b>	<b>00h 43'</b>	<b>+41° 16'</b>	<b>+4.3</b>	<b>Galaxy</b>	
<b>Andromeda</b>	<b>M32</b>	<b>00h 43'</b>	<b>+40° 52'</b>	<b>+8.8</b>	<b>Galaxy</b>	
<b>Andromeda</b>	<b>NGC752</b>	<b>01h 58'</b>	<b>+37° 42'</b>	<b>+6.6</b>	<b>Open Cluster</b>	
<b>Andromeda</b>	<b>NGC691</b>	<b>02h 22'</b>	<b>+42° 20'</b>	<b>+10.8</b>	<b>Galaxy</b>	
<b>Andromeda</b>	<b>NGC891</b>	<b>02h 223'</b>	<b>+42° 21'</b>	<b>+10.8</b>	<b>Galaxy</b>	
<b>Andromeda</b>	<b>NGC7662</b>	<b>23h 26'</b>	<b>+42° 33'</b>	<b>+9.8</b>	<b>Planetary Nebula</b>	
<b>Auriga</b>	<b>IC405</b>	<b>05h 17'</b>	<b>+34°17'</b>		<b>Nebula</b>	
<b>Auriga</b>	<b>IC417</b>	<b>05h 28'</b>	<b>+34° 26'</b>	<b>+8</b>	<b>Emission Nebula</b>	
<b>Auriga</b>	<b>M38</b>	<b>05h 29'</b>	<b>+35° 50'</b>	<b>+6.8</b>	<b>Open Cluster</b>	
<b>Auriga</b>	<b>NGC1931</b>	<b>05h 31'</b>	<b>+34° 15'</b>	<b>+10.1</b>	<b>Emission Nebula</b>	

<b>Auriga</b>	<b>M36</b>	<b>05h 36'</b>	<b>+34° 08'</b>	<b>+6.5</b>	<b>Open Cluster</b>	
<b>Auriga</b>	<b>M37</b>	<b>05h 52'</b>	<b>+32° 33'</b>	<b>+6.2</b>	<b>Open Cluster</b>	
<b>Auriga</b>	<b>IC2149</b>	<b>05h 58'</b>	<b>+46° 07'</b>	<b>+11.0</b>	<b>Planetary Nebula</b>	
<b>Camelopardis</b>	<b>IC342</b>	<b>03h 47'</b>	<b>+68° 06'</b>	<b>+9.1</b>	<b>Galaxy</b>	
<b>Camelopardis</b>	<b>NGC1502</b>	<b>04h 08'</b>	<b>+62° 21'</b>	<b>+4.1</b>	<b>Open Cluster</b>	
<b>Camelopardis</b>	<b>NGC2403</b>	<b>07h 37'</b>	<b>+65° 35'</b>	<b>+8.9</b>	<b>Galaxy</b>	
<b>Cassiopeia</b>	<b>NGC129</b>	<b>00h 30'</b>	<b>+60° 13'</b>	<b>+9.8</b>	<b>Open Cluster</b>	
<b>Cassiopeia</b>	<b>NGC281</b>	<b>00h 53'</b>	<b>+56° 38'</b>	<b>+7.4</b>	<b>Diffuse Nebula</b>	
<b>Cassiopeia</b>	<b>NGC457</b>	<b>01h 19'</b>	<b>+58° 19'</b>	<b>+5.1</b>	<b>Open Cluster</b>	
<b>Cassiopeia</b>	<b>M103</b>	<b>01h 33'</b>	<b>+60° 42'</b>	<b>+6.9</b>	<b>Open Cluster</b>	
<b>Cassiopeia</b>	<b>M52</b>	<b>23h 24'</b>	<b>+61° 35'</b>	<b>+8.2</b>	<b>Open Cluster</b>	
<b>Cepheus</b>	<b>NGC40</b>	<b>00h 13'</b>	<b>+72° 33'</b>	<b>+10.7</b>	<b>Planetary Nebula</b>	
<b>Cepheus</b>	<b>NGC188</b>	<b>00h 44'</b>	<b>+85° 22'</b>	<b>+9.3</b>	<b>Open Cluster</b>	
<b>Cepheus</b>	<b>NGC7023</b>	<b>21h 02'</b>	<b>+68° 10'</b>	<b>+6.8</b>	<b>Reflection Nebula</b>	
<b>Cepheus</b>	<b>NGC7354</b>	<b>22h 40'</b>	<b>+61° 17'</b>	<b>+12.2</b>	<b>Planetary Nebula</b>	
<b>Cetus</b>	<b>NGC246</b>	<b>00h 47'</b>	<b>-11° 52'</b>	<b>+8</b>	<b>Planetary Nebula</b>	
<b>Cetus</b>	<b>NGC936</b>	<b>02h 28'</b>	<b>-01° 09'</b>	<b>+10.2</b>	<b>Galaxy</b>	
<b>Cetus</b>	<b>M77</b>	<b>02h 43'</b>	<b>-00° 01'</b>	<b>+9.5</b>	<b>Galaxy</b>	
<b>Draco</b>	<b>NGC5907</b>	<b>15h 15'</b>	<b>+56° 19'</b>	<b>+11.1</b>	<b>Galaxy</b>	
<b>Draco</b>	<b>NGC6543</b>	<b>17h 58'</b>	<b>+66° 37'</b>	<b>+8.8</b>	<b>Planetary Nebula</b>	
<b>Eridanus</b>	<b>NGC1084</b>	<b>02h 47'</b>	<b>-07° 31'</b>	<b>+10.6</b>	<b>Galaxy</b>	
<b>Eridanus</b>	<b>NGC1535</b>	<b>04h 15'</b>	<b>-12° 41'</b>	<b>+10.0</b>	<b>Planetary Nebula</b>	
<b>Eridanus</b>	<b>NGC1637</b>	<b>04h 42'</b>	<b>-02° 49'</b>	<b>+11.5</b>	<b>Galaxy</b>	
<b>Eridanus</b>	<b>IC2118</b>	<b>05h 08'</b>	<b>-07° 12'</b>	<b>+13.0</b>	<b>Nebula</b>	
<b>Lacerta</b>	<b>NGC7209</b>	<b>22h 05'</b>	<b>+46° 29'</b>	<b>+7.8</b>	<b>Open Cluster</b>	
<b>Lepus</b>	<b>Abell7</b>	<b>05h 03'</b>	<b>-15° 36'</b>	<b>+12.2</b>	<b>Planetary Nebula</b>	
<b>Lepus</b>	<b>M79</b>	<b>05h 25'</b>	<b>-24° 32'</b>	<b>+8.0</b>	<b>Globular Cluster</b>	

<b>Lepus</b>	<b>IC418</b>	<b>05h 28'</b>	<b>-12° 41'</b>	<b>+11.0</b>	<b>Planetary Nebula</b>	
<b>Orion</b>	<b>NGC1662</b>	<b>04h 48'</b>	<b>+10° 56'</b>	<b>+8.0</b>	<b>Open Cluster</b>	
<b>Orion</b>	<b>Jonckheere 320</b>	<b>05h 06'</b>	<b>+10° 42'</b>	<b>+11.8</b>	<b>Planetary Nebula</b>	
<b>Orion</b>	<b>NGC1788</b>	<b>05h 07'</b>	<b>-03° 21'</b>		<b>Reflection Nebula</b>	
<b>Orion</b>	<b>NGC1994</b>	<b>05h 28'</b>	<b>-05° 19'</b>	<b>+13.3</b>	<b>Galaxy</b>	
<b>Orion</b>	<b>Abell10</b>	<b>05h 32'</b>	<b>+06° 56'</b>	<b>+15.2</b>	<b>Planetary Nebula</b>	
<b>Orion</b>	<b>M42</b>	<b>05h 35'</b>	<b>-05° 27'</b>	<b>+4.0</b>	<b>Diffuse Nebula</b>	
<b>Orion</b>	<b>NGC1981</b>	<b>05h 35'</b>	<b>-04° 24'</b>	<b>+4.2</b>	<b>Open Cluster</b>	
<b>Orion</b>	<b>M43</b>	<b>05h 36'</b>	<b>-05° 16'</b>	<b>+9.0</b>	<b>Diffuse Nebula</b>	
<b>Orion</b>	<b>NGC1999</b>	<b>05h 36'</b>	<b>-06° 43'</b>	<b>+9.5</b>	<b>Planetary Nebula</b>	
<b>Orion</b>	<b>Barnard 33</b>	<b>05h 41'</b>	<b>-02° 27'</b>	<b>H/head</b>	<b>Dark nebula</b>	
<b>Orion</b>	<b>NGC2022</b>	<b>05h 42'</b>	<b>+09° 05'</b>	<b>+12.4</b>	<b>Planetary Nebula</b>	
<b>Orion</b>	<b>NGC2024</b>	<b>05h 42'</b>	<b>-01° 51'</b>	<b>Flame Neb</b>	<b>Emission Nebula</b>	
<b>Orion</b>	<b>M78</b>	<b>05h 47'</b>	<b>+00° 05'</b>	<b>+8.0</b>	<b>Reflection Nebula</b>	
<b>Orion</b>	<b>NGC2112</b>	<b>05h 54'</b>	<b>+00° 25'</b>	<b>+9.0</b>	<b>Emission Nebula</b>	
<b>Orion</b>	<b>NGC2169</b>	<b>06h 08'</b>	<b>+13° 57'</b>	<b>+7.0</b>	<b>Open Cluster</b>	
<b>Pegasus</b>	<b>M15</b>	<b>21h 30'</b>	<b>+12° 10'</b>	<b>+6.4</b>	<b>Globular Cluster</b>	
<b>Pegasus</b>	<b>NGC7094</b>	<b>21h 37'</b>	<b>+12° 47'</b>	<b>+13.4</b>	<b>Planetary Nebula</b>	
<b>Perseus</b>	<b>M76</b>	<b>01h 42'</b>	<b>+51° 34'</b>	<b>+12.2</b>	<b>Planetary Nebula</b>	
<b>Perseus</b>	<b>NGC869</b>	<b>02h 19'</b>	<b>+57° 08'</b>	<b>+4.3</b>	<b>Open Cluster</b>	
<b>Perseus</b>	<b>NGC884</b>	<b>02h 22'</b>	<b>+57° 06'</b>	<b>+4.3</b>	<b>Open Cluster</b>	
<b>Perseus</b>	<b>NGC1023</b>	<b>02h 40'</b>	<b>+39° 04'</b>	<b>+10.35</b>	<b>Galaxy</b>	
<b>Perseus</b>	<b>M34</b>	<b>02h 42'</b>	<b>+42° 47'</b>	<b>+5.8</b>	<b>Open Cluster</b>	
<b>Perseus</b>	<b>NGC1499</b>	<b>04h 03'</b>	<b>+36° 23'</b>	<b>+5.0</b>	<b>Diffuse Nebula</b>	
<b>Perseus</b>	<b>NGC1491</b>	<b>04h 03'</b>	<b>+51° 19'</b>		<b>Emission Nebula</b>	

<b>Perseus</b>	<b>NGC1579</b>	<b>04h 30'</b>	<b>+35° 16'</b>		<b>Emission Nebula</b>	
<b>Pisces</b>	<b>NGC507</b>	<b>01h 23'</b>	<b>+33° 15'</b>	<b>+11.2</b>	<b>Galaxy</b>	
<b>Pisces</b>	<b>M74</b>	<b>01h 37'</b>	<b>+15° 47'</b>	<b>+10.0</b>	<b>Galaxy</b>	
<b>Taurus</b>	<b>M45</b>	<b>03h 47'</b>	<b>+24° 07'</b>	<b>+1.2</b>	<b>Open Cluster</b>	
<b>Taurus</b>	<b>NGC1514</b>	<b>04h 09'</b>	<b>+30° 47'</b>	<b>+10.0</b>	<b>Planetary Nebula</b>	
<b>Taurus</b>	<b>Hyades</b>	<b>04h 26'</b>	<b>+15° 51'</b>	<b>+0.8</b>	<b>Open Cluster</b>	
<b>Taurus</b>	<b>NGC1647</b>	<b>04h 46'</b>	<b>+19° 07'</b>	<b>+6.2</b>	<b>Open Cluster</b>	
<b>Taurus</b>	<b>NGC1746</b>	<b>05h 03'</b>	<b>+23° 49'</b>	<b>+6.1</b>	<b>Open Cluster</b>	
<b>Taurus</b>	<b>M1</b>	<b>05h 34'</b>	<b>+22° 01'</b>	<b>+8.4</b>	<b>Supernova remnant</b>	
<b>Triangulum</b>	<b>M33</b>	<b>01h 34'</b>	<b>+30° 39'</b>	<b>+5.7</b>	<b>Galaxy</b>	
<b>Triangulum</b>	<b>NGC672</b>	<b>01h 47'</b>	<b>+27° 25'</b>	<b>+11.6</b>	<b>Galaxy</b>	
<b>Triangulum</b>	<b>IC1727</b>	<b>01h 47'</b>	<b>+27° 20'</b>	<b>11.4</b>	<b>Galaxy</b>	
<b>Triangulum</b>	<b>NGC925</b>	<b>02h 27'</b>	<b>+33° 34'</b>	<b>+10.9</b>	<b>Galaxy</b>	
<b>Ursa Major</b>	<b>M81</b>	<b>09h 56'</b>	<b>+69° 04'</b>	<b>+7.8</b>	<b>Galaxy</b>	
<b>Ursa Major</b>	<b>M82</b>	<b>09h 56'</b>	<b>+69° 41'</b>	<b>+9.2</b>	<b>Galaxy</b>	
<b>Ursa Major</b>	<b>NGC3079</b>	<b>10h 02'</b>	<b>+55° 41'</b>	<b>+10.9</b>	<b>Galaxy</b>	
<b>Ursa Major</b>	<b>NGC3077</b>	<b>10h 03'</b>	<b>+68° 44'</b>	<b>+9.8</b>	<b>Galaxy</b>	
<b>Ursa Major</b>	<b>NGC3198</b>	<b>10h 20'</b>	<b>+45° 33'</b>	<b>+10.3</b>	<b>Galaxy</b>	
<b>Ursa Major</b>	<b>M108</b>	<b>11h 11'</b>	<b>+55° 40'</b>	<b>+10.9</b>	<b>Galaxy</b>	
<b>Ursa Major</b>	<b>M97</b>	<b>11h 15'</b>	<b>+55° 01'</b>	<b>+12.0</b>	<b>Planetary Nebula</b>	
<b>Ursa Major</b>	<b>NGC3675</b>	<b>11h 26'</b>	<b>+43° 35'</b>	<b>+11.0</b>	<b>Galaxy</b>	
<b>Ursa Major</b>	<b>NGC3726</b>	<b>11h 33'</b>	<b>+47° 01'</b>	<b>+10.9</b>	<b>Galaxy</b>	
<b>Ursa Major</b>	<b>NGC3877</b>	<b>11h 46'</b>	<b>+47° 29'</b>	<b>+11.8</b>	<b>Galaxy</b>	
<b>Ursa Major</b>	<b>NGC3893</b>	<b>11h 49'</b>	<b>+48° 43'</b>	<b>+10.5</b>	<b>Galaxy</b>	
<b>Ursa Major</b>	<b>NGC3953</b>	<b>11h 54'</b>	<b>+52° 20'</b>	<b>+10.1</b>	<b>Galaxy</b>	
<b>Ursa Major</b>	<b>M109</b>	<b>11h 58'</b>	<b>+53° 23'</b>	<b>+10.8</b>	<b>Galaxy</b>	
<b>Ursa Major</b>	<b>NGC4026</b>	<b>11h 59'</b>	<b>+50° 57'</b>	<b>+11.7</b>	<b>Galaxy</b>	

<b>Ursa Major</b>	<b>NGC4036</b>	<b>12h 01'</b>	<b>+61° 54'</b>	<b>+10.7</b>	<b>Galaxy</b>	
<b>Ursa Major</b>	<b>NGC4051</b>	<b>12h 03'</b>	<b>+44° 32'</b>	<b>+10.2</b>	<b>Galaxy</b>	
<b>Ursa Major</b>	<b>M40</b>	<b>12h 22'</b>	<b>+58° 50'</b>	<b>+8.0</b>	<b>Double Star</b>	
<b>Ursa Major</b>	<b>M101</b>	<b>14h 03'</b>	<b>+54° 21'</b>	<b>+7.7</b>	<b>Galaxy</b>	