







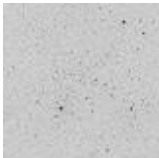
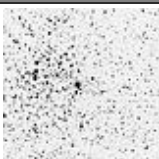
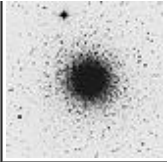

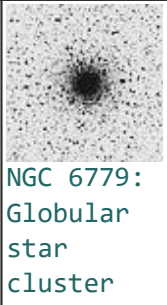
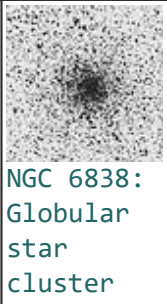
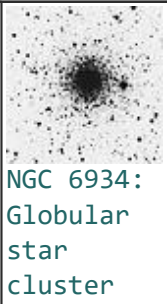
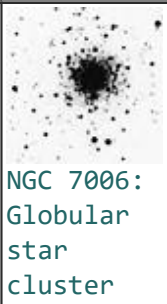



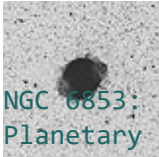
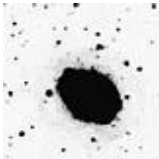
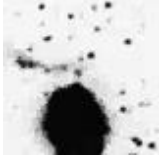
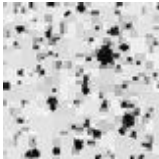
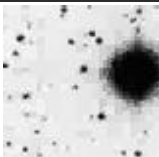

# The Calendar-Sky

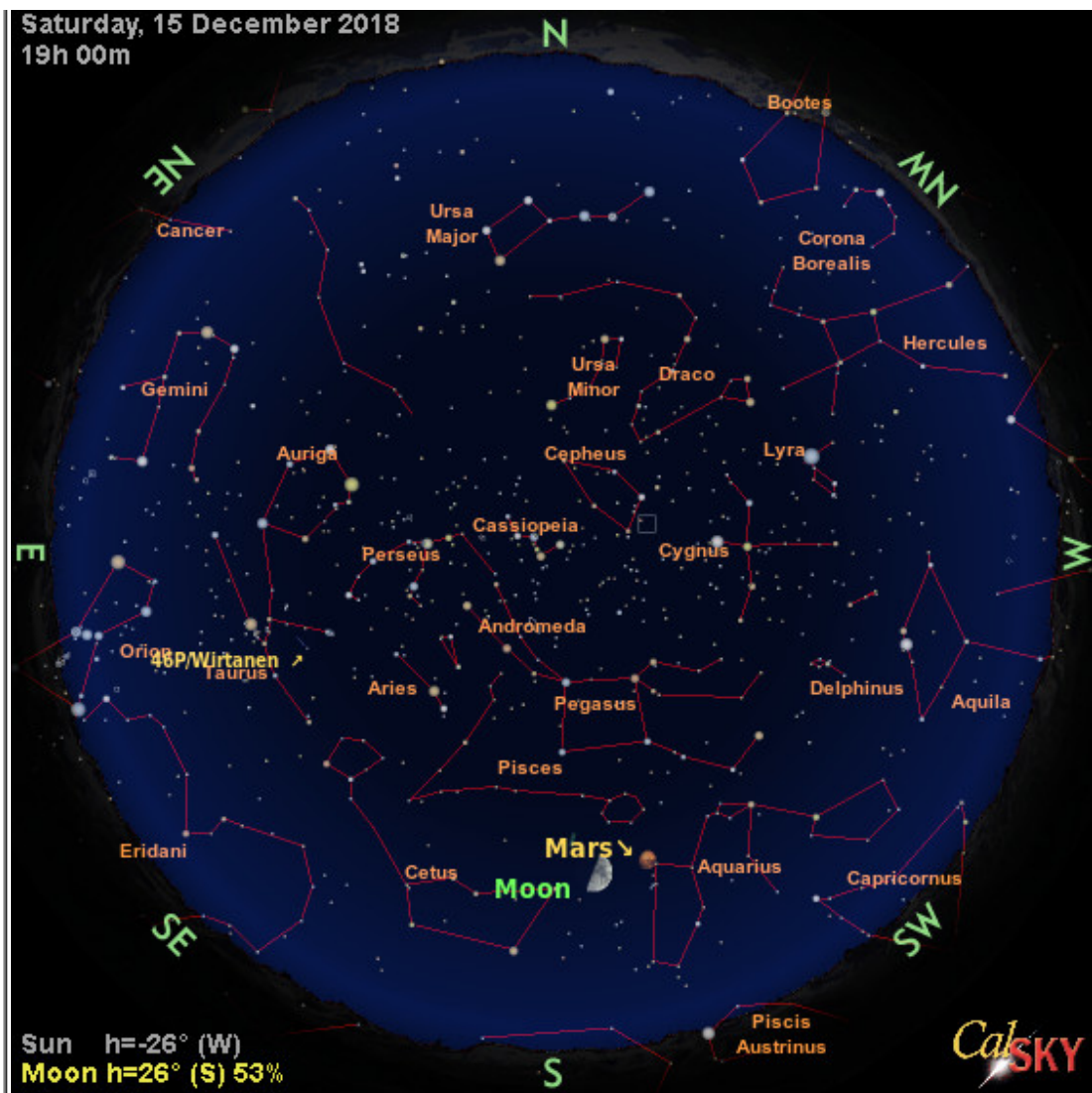
## Saturday 15 December 2018

Time (24-hour clock)	Object (Link)	Event
	Observer Site	JSLObs, United Kingdom WGS84: Lon: -4d05m30.33s Lat: +57d28m38.01s Alt: 205m Geoid Alt: 152m All times in GMT or BST (during summer)
19.0h	 Mars	Magnitude= 0.2mag Best seen from 15.9h -23.5h ( $h_{top}=22^\circ$ at SE at 15.9h) (in constellation Aquarius) RA=23h20m10s Dec= $-5^\circ03.5'$ (J2000) Distance=1.127AU Elongation= $85^\circ$ Phase k=86% Diameter=8.3" planetographic latitude of the Earth= $-26.2^\circ$
19.0h	 Uranus	Magnitude= 5.8mag Best seen from 17.2h - 2.9h ( $h_{top}=43^\circ$ at S at 20.4h) (in constellation Pisces) RA= 1h46m52s Dec= $+10^\circ26.9'$ (J2000) Distance=19.282AU Elongation= $125^\circ$ Diameter=3.6"
19.0h	 Neptune	Magnitude= 7.8mag Best seen from 17.6h -21.3h ( $h_{top}=25^\circ$ at S at 17.7h) (in constellation Aquarius) RA=23h00m55s Dec= $-7^\circ21.9'$ (J2000) Distance=30.093AU Elongation= $80^\circ$ Diameter=2.2"
19.0h	 Pluto	Magnitude=14.3mag Best seen from 17.6h - 6.8h (in constellation Sagittarius) RA=19h25m48s Dec= $-22^\circ03.2'$ (J2000) Distance=34.580AU Elongation= $26^\circ$ Diameter=0.1"
19.0h	 Stephan-Oterma →Star chart	Comet '38P' <b>Magnitude= 9.8mag</b> Best seen from 18.6h - 6.8h ( $h_{top}=67^\circ$ at S at 3.1h) (in constellation Lynx) RA= 8h26m55s Dec= $+34^\circ33.8'$ (J2000), hourly motion: 67.0"/h Position angle= $24.1^\circ$ dRA= 2.2sec/h dDec= 61.1"/h, Distance to Sun= 1.65AU, Distance to Earth= 0.77AU, Elongation= $140^\circ$ , $h=14.2^\circ$ az= $46.3^\circ$ /NE, Sun altitude= $-26^\circ$ , Elongation from Moon center= $124^\circ$ , Moon elevation= $26^\circ$ S, Moon phase=53% Position angle of ion tail= $266^\circ$ (re zenith= $294^\circ$ ), Length of a 0.05AU long tail=27', Position angle of dust trail (not tail)= $204^\circ$ (re zenith= $232^\circ$ ), Orbit direction= $92^\circ$ (almost parallel to Earth, towards Earth; dust trail would be long but faint), Latitude of Earth above orbit plane= $-2^\circ$ (Earth close to orbit plane - a tail would relatively easy to be seen)
19.0h	 Wirtanen →Star chart	Comet '46P' <b>Magnitude= 5.7mag</b> Best seen from 17.2h - 6.3h ( $h_{top}=52^\circ$ at S at 22.6h) (in constellation Taurus) RA= 3h54m16s Dec= $+19^\circ25.3'$ (J2000), hourly motion: 639.7"/h Position angle= $28.3^\circ$ dRA= 22.0sec/h dDec=561.3"/h, Distance to Sun= 1.06AU, Distance to Earth= 0.08AU, Elongation= $157^\circ$ , $h=35.6^\circ$ az= $111.1^\circ$ /ESE, Sun altitude= $-26^\circ$ , Elongation from Moon center= $64^\circ$ , Moon elevation= $26^\circ$ S, Moon phase=53% Position angle of ion tail= $78^\circ$ (re zenith= $110^\circ$ ), Length of a 0.07AU long tail=2.6', Position angle of dust trail (not tail)= $209^\circ$ (re zenith= $241^\circ$ ), Orbit direction= $93^\circ$ (almost parallel to Earth, towards Earth; dust trail would be long but faint), Latitude of Earth above orbit plane= $-3^\circ$ (Earth close to orbit plane - a tail would relatively easy to be seen)

19.0h	 Swift-Gehrels →Star chart	Comet '64P' <b>Magnitude=11.9mag</b> Best seen from 17.6h - 5.1h ( $h_{top}=65^\circ$ at S at 21.0h) (in constellation Triangulum) RA= 2h17m48s Dec=+32°15.3' (J2000), hourly motion: 81.3"/h Position angle=106.8° dRA= 6.1sec/h dDec=-23.7"/h, Distance to Sun= 1.48AU, Distance to Earth= 0.60AU, Elongation=137°, $h=57.9^\circ$ az=128.7°/SE, Sun altitude=-26°, Elongation from Moon center=51°, Moon elevation=26° S, Moon phase=53% Position angle of ion tail=92° (re zenith=122°), Length of a 0.05AU long tail=27', Position angle of dust trail (not tail)=287° (re zenith=317°), Orbit direction=40° (away from Earth), Latitude of Earth above orbit plane=-9°
19.0h	 Pan-STARRS →Star chart	Comet 'C/2016 R2' <b>Magnitude=11.9mag</b> Best seen from 17.6h -19.4h ( $h_{top}=20^\circ$ at NW at 17.6h) (in constellation Bootes) RA=15h01m02s Dec=+40°34.6' (J2000), hourly motion: 44.1"/h Position angle= 93.3° dRA= 3.9sec/h dDec= -2.7"/h, Distance to Sun= 3.46AU, Distance to Earth= 3.62AU, Elongation= 73°, $h=13.7^\circ$ az=329.7°/NNW, Sun altitude=-26°, Elongation from Moon center=126°, Moon elevation=26° S, Moon phase=53% Position angle of ion tail=324° (re zenith=303°), Length of a 0.02AU long tail=5', Latitude of Earth above orbit plane=-1°
19.0h	(3) Juno →Star chart	Asteroid with <b>Magnitude= 7.8mag</b> Best seen from 18.3h - 2.2h ( $h_{top}=28^\circ$ at S at 22.2h) RA= 3h35m27.2s Dec= -4°06'50" (J2000) (in constellation Eridani/Eri) Distance to Sun=1.988AU Distance to Earth=1.127AU hourly motion: 16.4"/h Position angle=304.6° dRA= -0.9sec/h dDec= 9.3"/h
19.0h	(433) Eros →Star chart	Asteroid with <b>Magnitude= 9.4mag</b> Best seen from 17.6h - 6.8h ( $h_{top}=88^\circ$ at N at 22.9h) RA= 4h13m49.7s Dec=+59°38'05" (J2000) (in constellation Camelopardalis/Cam) Distance to Sun=1.188AU Distance to Earth=0.249AU hourly motion: 54.4"/h Position angle=196.5° dRA= -2.0sec/h dDec=-52.2"/h
19.0h	 IC 4756: Open star cluster	IC 4756 <b>Magnitude=5mag Diameter=52'</b> RA=18h39.0m Dec= +5°27' (in constellation Serpens Cauda/Ser) best seen between 16.4h -19.9h ( $h_{top}=27^\circ$ at SW at 16.4h). cluster, compressed
19.0h	 NGC 7654: Open star cluster	M 52 (NGC 7654) <b>Magnitude=6.9mag Diameter=13'</b> RA=23h24.2m Dec=+61°35' (in constellation Cassiopeia/Cas) best seen between 16.8h - 7.6h ( $h_{top}=82^\circ$ at NW at 19.0h). cluster, large, rich, much compressed (in the) middle, round, stars 9...13 mag; = Messier 52
19.0h	NGC 7078: Globular star cluster	M 15 (NGC 7078) <b>Magnitude=6.4mag Diameter=12.3'</b> RA=21h30.0m Dec=+12°10' (in constellation Pegasus/Peg) best seen between 16.8h -23.5h ( $h_{top}=44^\circ$ at SSW at 16.8h). remarkable, globular cluster, very bright, very large, irregular round, very suddenly much brighter in the middle, well resolved, stars very small; = Messier 15

		
19.0h	 NGC 7089: Globular star cluster	<b>M 2 (NGC 7089) Magnitude=6.5mag Diameter=12.9'</b> RA=21h33.5m Dec= -0°49' (in constellation Aquarius/Aqr) best seen between 16.8h -22.1h (h <sub>top</sub> =31° at S at 16.8h). very remarkable, globular cluster, bright, very large, gradually pretty much brighter (in the) middle, well resolved, stars extremely small; = Messier 2
19.0h	 NGC 6779: Globular star cluster	<b>M 56 (NGC 6779) Magnitude=8.3mag Diameter=7.1'</b> RA=19h16.6m Dec=+30°11' (in constellation Lyra/Lyr) best seen between 17.6h -23.0h (h <sub>top</sub> =43° at WSW at 17.6h). globular cluster, bright, large, irregular round, gradually very much compressed (in the) middle, well resolved, stars 11...14 mag; = Messier 5
19.0h	 NGC 6838: Globular star cluster	<b>M 71 (NGC 6838) Magnitude=8.3mag Diameter=7.2'</b> RA=19h53.8m Dec=+18°47' (in constellation Sagitta/Sge) best seen between 17.6h -22.0h (h <sub>top</sub> =39° at WSW at 17.6h). cluster, very large, very rich, pretty much compressed, stars 11...16 mag; = Messier 71
19.0h	 NGC 6934: Globular star cluster	<b>NGC 6934 Magnitude=8.9mag Diameter=5.9'</b> RA=20h34.2m Dec= +7°24' (in constellation Delphinus/Del) best seen between 17.6h -21.4h (h <sub>top</sub> =33° at SW at 17.6h). globular cluster, bright, large, round, well resolved, stars 16... mag, star 9 mag preceding (westward)
19.0h	 NGC 7006: Globular star cluster	<b>NGC 7006 Magnitude=10.6mag Diameter=2.8'</b> RA=21h01.5m Dec=+16°11' (in constellation Delphinus/Del) best seen between 17.6h -21.9h (h <sub>top</sub> =43° at SW at 17.6h). bright, pretty large, round, gradually brighter (in the) middle
19.0h	 NGC 7492: Globular star cluster	<b>NGC 7492 Magnitude=11.5mag Diameter=6.2'</b> RA=23h08.4m Dec=-15°37' (in constellation Aquarius/Aqr) best seen between 17.6h -20.0h (h <sub>top</sub> =17° at S at 17.8h). extremely faint, large, cluster of extremely faint stars
19.0h		<b>Dumbbell nebula, M 27 (NGC 6853) Magnitude=8.1mag Diameter=15.2'</b> RA=19h59.6m Dec=+22°43' (in constellation Vulpecula/Vul) best seen

	 NGC 6853: Planetary nebula	between 17.2h -22.5h ( $h_{\text{top}}=46^\circ$ at SW at 17.2h). magnificent or interesting, very bright, very large, binuclear, irregular extended ( Dumbbell ); = Messier 27
19.0h	 NGC 6720: Planetary nebula	<b>M 57, Ring nebula in Lyra (NGC 6720) Magnitude=9mag Diameter=2.5'</b> RA=18h53.6m Dec=+33°02' (in constellation Lyra/Lyr) best seen between 17.6h -23.2h ( $h_{\text{top}}=43^\circ$ at W at 17.6h). magnificent or interesting, ring, bright, pretty large, considerably extended ( in Lyra ); = Messier 57
19.0h	 NGC 40: Planetary nebula	<b>NGC 40 Magnitude=11mag Diameter=0.6'</b> RA= 0h13.0m Dec=+72°32' (in constellation Cepheus/Cep) best seen between 17.6h - 6.8h ( $h_{\text{top}}=75^\circ$ at N at 19.0h). faint, very small, round, very suddenly much brighter in the middle, star 12 mag south preceding
19.0h	 NGC 6803: Planetary nebula	<b>NGC 6803 Magnitude=11mag Diameter=0.1'</b> RA=19h31.3m Dec=+10°03' (in constellation Aquila/Aql) best seen between 17.6h -19.7h ( $h_{\text{top}}=28^\circ$ at WSW at 17.6h). planetary nebula, stellar
19.0h	 NGC 7027: Planetary nebula	<b>NGC 7027 Magnitude=10mag Diameter=0.3'</b> RA=21h07.1m Dec=+42°14' (in constellation Cygnus/Cyg) best seen between 17.6h - 2.0h ( $h_{\text{top}}=67^\circ$ at WSW at 17.6h). planetary nebula, stellar = 8.5 mag
19.0h	 Star chart	



Sun h=-26° (W)  
Moon h=26° (S) 53%

19h08m24s

COSMO-SkyMed  
2

Flare from unknown Mirror **Magnitude= 4.5mag**  
Azimuth=211.0° SSW altitude= 24.6° in constellation Aquarius  
RA=22h37.6m Dec= -3°55'  
Flare angle=7.41°  
In a clock-face concept, the satellite will seem to move toward 6:36  
Angular Velocity=11.9'/s

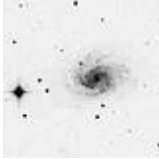

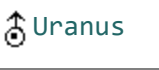





**Flare center line, closest point →MapIt:** Longitude=0.773°E  
Latitude=+57.708° (WGS84) **Distance=290.8 km** Azimuth= 82.9° E Peak  
Magnitude=-0.2mag  
Satellite above: longitude=12.3°W latitude=+47.2° height above  
Earth=629.3 km distance to satellite=1280.4 km  
Altitude of Sun=-27.1°  
This is an experimental flare prediction. Brightness estimate may be  
unreliable. Please report a successful observation (Object/site  
coordinates/date/measured time/accuracy/magnitude).


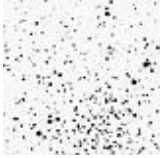

19h33m31s

COSMO-SkyMed  
4

Flare from unknown Mirror **Magnitude= 0.7mag**  
Azimuth=224.4° SW altitude= 12.8° in constellation Aquarius  
RA=21h59.0m Dec=-10°49'  
Flare angle=0.99°  
In a clock-face concept, the satellite will seem to move toward 7:13  
Angular Velocity=7.8'/s

**Flare center line, closest point →MapIt:** Longitude=5.322°W  
Latitude=+57.595° (WGS84) **Distance=74.5 km** Azimuth=280.6° W Peak  
Magnitude=-0.1mag  
Satellite above: longitude=18.4°W latitude=+47.0° height above

		<p>Earth=629.5 km distance to satellite=1817.0 km          Altitude of Sun=-30.4°          This is an experimental flare prediction. Brightness estimate may be unreliable. Please report a successful observation (Object/site coordinates/date/measured time/accuracy/magnitude).</p>
20.0h	 NGC 514: Galaxy	<p><b>NGC 514 Magnitude=11.9mag Diameter=3.5'</b>          RA= 1h24.1m Dec=+12°55' (in constellation Pisces/Psc) best seen between 17.6h - 1.9h (h<sub>top</sub>=45° at S at 20.0h).          faint, large, little extended, very gradually little brighter (in the middle, double star following (eastward))</p>
20.3h	 (6) Hebe →Star chart	<p>Asteroid with <b>Magnitude= 8.5mag</b>          Best seen from 20.3h - 6.2h (h<sub>top</sub>=37° at S at 1.2h)          RA= 6h35m42.4s Dec= +4°08'24" (J2000) (in constellation Monoceros/Mon)          Distance to Sun=2.194AU Distance to Earth=1.260AU          hourly motion: 38.4"/h Position angle=287.5° dRA= -2.5sec/h dDec= 11.5"/h</p>
20h26.5m	 Uranus	<p>Transit Altitude=+43.1° (in constellation Pisces) Elongation=125.0° East, Magnitude=5.8mag</p>
21.3h	 NGC 1039: Open star cluster	<p><b>M 34 (NGC 1039) Magnitude=5.2mag Diameter=35'</b>          RA= 2h42.0m Dec=+42°47' (in constellation Perseus/Per) best seen between 16.4h - 8.0h (h<sub>top</sub>=75° at S at 21.3h).          cluster, bright, very large, little compressed, scattered stars 9 mag; = Messier 34</p>
22.3h	 NGC 1400: Galaxy	<p><b>NGC 1400 Magnitude=11.1mag Diameter=1.9'</b>          RA= 3h39.5m Dec=-18°41' (in constellation Eridani/Eri) best seen between 21.0h -23.6h (h<sub>top</sub>=14° at S at 22.3h).          considerably bright, pretty small, round, pretty suddenly much brighter in the middle</p>
22.5h	 NGC 1444: Open star cluster	<p><b>NGC 1444 Magnitude=6.6mag Diameter=4'</b>          RA= 3h49.4m Dec=+52°40' (in constellation Perseus/Per) best seen between 16.8h - 7.6h (h<sub>top</sub>=85° at S at 22.5h).          cluster of about 30 stars 12...14 mag</p>
22.8h	 NGC 1514: Planetary nebula	<p><b>NGC 1514 Magnitude=10mag Diameter=1.9'</b>          RA= 4h09.2m Dec=+30°47' (in constellation Taurus/Tau) best seen between 17.6h - 6.7h (h<sub>top</sub>=63° at S at 22.8h).          star 9 mag in nebula(e) 3' diameter</p>
22.8h	 NGC 1513: Open star cluster	<p><b>NGC 1513 Magnitude=8.4mag Diameter=9'</b>          RA= 4h10.0m Dec=+49°31' (in constellation Perseus/Per) best seen between 17.6h - 6.8h (h<sub>top</sub>=82° at S at 22.8h).          cluster, large, very rich, pretty compressed, stars very large</p>

22.9h	 <b>NGC 1535:</b> Planetary nebula	<b>NGC 1535 Magnitude=10mag Diameter=0.7'</b> RA= 4h14.2m Dec=-12°44' ( <b>in constellation Eridani/Eri</b> ) best seen between 20.1h - 1.6h ( $h_{top}=20^\circ$ at S at 22.9h). planetary nebula, very bright, small, round, pretty small, very suddenly brighter (in the) middle, resolvable
23.0h	 <b>IC 361:</b> Open star cluster	<b>IC 361 Magnitude=11.7mag Diameter=6'</b> RA= 4h19.0m Dec=+58°18' ( <b>in constellation Camelopardalis/Cam</b> ) best seen between 17.6h - 6.8h ( $h_{top}=89^\circ$ at N at 23.0h). faint, large ( nebula(e) cluster?)
22h58.3m	 Neptune	Set Azimuth=257.3°, WSW (in constellation Aquarius)

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**CalSKY** - your astronomical calendar at [www.CalSky.com](http://www.CalSky.com)