Select start of calculation:
Date: 12 August 2015
Time: 21 : 45 : 48 . 00 in TDT Now
Select duration: 2 Hours go!

The Calendar-Sky

The astronomical calendar contains **thousands of events per day** for every point on Earth. We know that you only care for a very few of these events and hence we let you personalize your own Astro-Calendar. You may primarily do so by switching to your appropriate user level, and by selecting some of the three dozens categories.

In parentheses are forced limits for the maximum calculation interval. The celestial calendar is to be found further below on this page and will appear within some seconds after pressing the *Go!*-Button (depending on the complexity of your selections). The calendar is created especially for you. The higher your user level, the more complex objects you selected, the longer it does take to calculate. *Please do not press the reload-button*; the calculations will take significantly longer.

Calendar and Timekeeping
- Space Calendar: Birthdays, Rocket Launches
- Local Events (Talks, Exhibitions)
- NASA TV Guide
- Local Telescope Dealers
- Public Holidays
- Saint's Day
- Zodiac of today. Change of Zodiac
- Islamic, Indian, Persian and Hebrew Calendar
- Week Number
- Sundials / GPS Time / Current Time Definitions
- Julian Day Number
- Sidereal Time
- Local Magnetic Field

General events
- Lunar Occultations (2 months)
- Planetary Conjunctions
- Lunar Eclipses
- Solar Eclipses and Transits
- Meteor Showers
- Planetary Phenomena
- Lunar Phenomena
- The Sun
- Asteroids (6 months)
- Comets

Earth orbiting satellites
- Space Station ISS (1 month)
- short duration Flares of Iridium satellites (14 days)
- Passes of other bright satellites (*1 day*, slow!)

Daily reoccurring events
- Graphical night calendar
- Sun and Moon
- Planets
- Asteroids
- Comets
- Meteor Showers
- Polar Star Transits
- Weather Balloons

Dimmer and more difficult objects
- Jupiter: Great Red Spot and satellite events
- Jupiter's Satellites: position
- Saturn: Satellite events and storms
- Saturn's Satellites: position
- Zodiacal light/Gegenschein
- Variable Stars (3 months)
- Supernovae
- Binary Stars

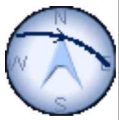
Deep sky objects
- Star chart
- Milky Way
- Galaxies
- Open Star Clusters
- Globular Star Clusters
- Nebula

go!

Wednesday 12 August 2015

Time (24-hour clock)	Object (Link)	Event
	Observer Site	Villeferry, France, France WGS84: Lon: +4d30m53.98s Lat: +47d27m17.41s Alt: 385m All times in CET or CEST (during summer)

	21h45m48s	Cosmos 2506 (40699 2015-029-A) →Ground track →Star chart	**Appears** **21h37m58s** 6.6mag az:163.8° SSE horizon **Culmination** **21h45m05s** **3.9mag** az: 75.1° **ENE** **h:89.4°** distance: 727.6km height above Earth: 727.9km elevation of Sun: -8° angular velocity: 0.61°/s **at Meridian** **21h45m09s** 3.9mag az: 0.0° N h:87.6° **Disappears** **21h52m14s** 8.6mag az:346.7° NNW horizon
	21h45m48s	ALOS (28931 2006-002-A) →Ground track →Star chart	**Appears** **21h38m29s** 5.8mag az:161.5° SSE horizon **Culmination** **21h45m23s** **3.0mag** az: 74.6° **ENE** **h:80.2°** distance: 702.9km height above Earth: 694.0km elevation of Sun: -8° angular velocity: 0.63°/s **at Meridian** **21h46m21s** 3.8mag az: 0.0° N h:56.1° **Disappears** **21h52m20s** 7.7mag az:348.1° NNW horizon
	21h45m48s	USA 32/Singlet SBWASS R1 (19460 1988-078-A) →Ground track →Star chart	**Appears** **21h33m41s** 7.7mag az:187.4° S horizon **Culmination** **21h41m16s** **5.1mag** az:276.1° **W** **h:78.6°** distance: 801.2km height above Earth: 787.5km elevation of Sun: -7° angular velocity: 0.55°/s **at Meridian** **21h44m16s** 6.9mag az: 0.0° N h:26.4° **Disappears** **21h48m54s** 8.7mag az: 5.2° N horizon
	21h45m48s	USA 173/NOSS 3-2A (28095 2003-054-A) →Ground track →Star chart	**Appears** **21h31m14s** 7.3mag az:208.4° SSW horizon **at Meridian** **21h38m36s** 4.5mag az:180.0° S h:55.5° **Culmination** **21h39m52s** **4.2mag** az:124.5° **SE** **h:69.2°** distance: 1061.4km height above Earth: 1002.1km elevation of Sun: -7° angular velocity: 0.41°/s **Disappears** **21h49m22s** 7.3mag az: 41.6° NE horizon
	21h45m48s	USA 181/NOSS 3-3A (28537 2005-004-A) →Ground track →Star chart	**Appears** **21h34m33s** 11.1mag az:318.1° NW horizon **Culmination** **21h44m27s** **5.6mag** az:236.5° **WSW** **h:65.7°** distance: 1304.3km height above Earth: 1207.7km elevation of Sun: -8° angular velocity: 0.31°/s **at Meridian** **21h46m25s** 5.5mag az:180.0° S h:49.5° **Disappears** **21h53m47s** 7.2mag az:155.4° SSE h:3.9°
	21h45m48s	USA 181-2/NOSS 3-3C (28541 2005-004-C) →Ground track →Star chart	**Appears** **21h34m40s** 11.1mag az:318.2° NW horizon **Culmination** **21h44m33s** **5.6mag** az:236.3° **WSW** **h:66.1°** distance: 1300.9km height above Earth: 1208.0km elevation of Sun: -8° angular velocity: 0.31°/s **at Meridian** **21h46m28s** 5.5mag az:180.0° S h:50.2° **Disappears** **21h53m52s** 7.2mag az:155.2° SSE h:4.0°
	21h49m40s	SJ 11-03 Rocket (37731 2011-030-B) →Ground track →Star chart	**Appears** **21h46m00s** 4.5mag az:108.4° ESE h:8.5° **Culmination** **21h49m40s** **4.1mag** az: 60.7° **ENE** **h:19.1°** distance: 1620.4km height above Earth: 696.6km elevation of Sun: -8° angular velocity: 0.27°/s **at Meridian** **21h55m41s** 6.8mag az: 0.0° N h:0.6° **Disappears** **21h55m45s** 6.8mag az:359.8° N horizon

21h49m52s	Iridium 52	Flare from solar panels **Magnitude=-1.9mag** Azimuth=140.2° SE altitude= 15.8° in constellation Capricornus RA=20h12.4m Dec=-17°24' Flare angle=0.56° **Flare center line, closest point** →MapIt: Longitude=4.142°E Latitude=+47.355° (WGS84) **Distance=30.2 km** Azimuth=248.6° WSW Peak Magnitude=-2.5mag Satellite above: longitude=16.3°E latitude=+34.8° height above Earth=781.5 km distance to satellite=1951.2 km Altitude of Sun=-8.3° 
21h52m24s	Koronas F Rocket (26874 2001-032-B) →Ground track →Star chart	**Appears** **21h47m30s** 5.8mag az:183.7° S horizon **at Meridian** **21h50m18s** 4.0mag az:180.0° S h:17.6° **Culmination** **21h52m24s** **2.1mag** az: 97.5° **E** **h:72.0°** distance: 394.8km height above Earth: 377.1km elevation of Sun: -9° angular velocity: 1.15°/s **Disappears** **21h57m23s** 6.8mag az: 11.5° NNE horizon 
21h56m21s	ISS →Ground track →Star chart	**Appears** **21h51m04s** 3.3mag az:289.6° WNW horizon **at Meridian** **21h56m10s** -2.8mag az: 0.0° N h:42.9° **Culmination** **21h56m21s** **-3.0mag** az: 10.9° **N** **h:43.4°** distance: 573.0km height above Earth: 406.9km elevation of Sun: -9° angular velocity: 0.76°/s **Disappears** **21h59m46s** -1.7mag az: 86.4° E h:8.5° 
21h57m12s	Object13-37DRk (39211 2013-037-D) →Ground track →Star chart	**Appears** **21h53m50s** 5.8mag az:145.6° SE h:10.0° **Culmination** **21h57m12s** **4.0mag** az: 71.5° **ENE** **h:46.2°** distance: 637.6km height above Earth: 475.0km elevation of Sun: -9° angular velocity: 0.71°/s **at Meridian** **22h00m06s** 7.0mag az: 0.0° N h:13.3° **Disappears** **22h02m41s** 8.6mag az:352.1° N horizon 
21h58m55s	USA 62/NOSS 2-1C (20692 1990-050-D) →Ground track →Star chart	**Appears** **21h50m45s** 11.3mag az:320.1° NW horizon **at Meridian** **21h56m56s** 7.0mag az: 0.0° N h:34.4° **Culmination** **21h58m55s** **6.2mag** az: 39.2° **NE** **h:42.5°** distance: 1495.5km height above Earth: 1092.2km elevation of Sun: -10° angular velocity: 0.27°/s **Disappears** **22h06m17s** 7.4mag az:108.4° ESE h:10.6° 
21h59m16s	**Iridium 53**	**Flare from solar panels Magnitude= 1.3mag Azimuth=144.8° SE altitude= 19.4° in constellation Sagittarius RA=19h59.0m Dec=-16°03' Flare angle=4.01° Flare center line, closest point** →MapIt: **Longitude=2.108°E Latitude=+46.872° (WGS84) Distance=193.0 km Azimuth=251.3° WSW Peak Magnitude=-2.5mag Satellite above: longitude=14.0°E latitude=+34.5° height above Earth=781.4 km distance to satellite=1765.3 km Altitude of Sun=-9.6°** 
22h00m22s	USA 61/NOSS 2-1B	**Appears** **21h52m11s** 11.3mag az:320.0° NW horizon 

		(20691 1990-050-C) →Ground track →Star chart	**at Meridian** **21h58m22s** 7.0mag az: 0.0° N h:34.5° **Culmination** **22h00m22s** **6.2mag** az: 39.1° **NE** **h:42.6°** distance: 1498.2km height above Earth: 1095.7km elevation of Sun: -10° angular velocity: 0.27°/s **Disappears** **22h07m42s** 7.4mag az:108.2° ESE h:10.8°
	22h03m25s	USA 245/KH (39232 2013-043-A) →Ground track →Star chart	**Appears** **22h02m34s** 4.8mag az: 89.7° E h:12.8° **Culmination** **22h03m25s** **4.9mag** az: 64.6° **ENE** **h:14.8°** distance: 925.2km height above Earth: 295.8km elevation of Sun: -10° angular velocity: 0.50°/s **Disappears** **22h07m24s** 8.0mag az: 2.0° N horizon Time uncertainty of about 5 seconds
	22h04m31s	Cosmos 1939 Rocket (19046 1988-032-B) →Ground track →Star chart	**Appears** **22h00m02s** 5.9mag az:161.4° SSE h:7.2° **Culmination** **22h04m31s** **3.5mag** az: 75.2° **ENE** **h:78.5°** distance: 565.6km height above Earth: 555.6km elevation of Sun: -10° angular velocity: 0.79°/s **at Meridian** **22h05m27s** 4.5mag az: 0.0° N h:50.5° **Disappears** **22h10m33s** 8.6mag az:348.6° NNW horizon
	22h04m43s	NOSS 3-1 Rocket (26906 2001-040-B) →Ground track →Star chart	**Appears** **21h57m39s** 5.6mag az:166.8° SSE h:1.3° **Culmination** **22h04m43s** **4.4mag** az:107.2° **ESE** **h:19.8°** distance: 2120.8km height above Earth: 993.5km elevation of Sun: -10° angular velocity: 0.21°/s **Disappears** **22h12m47s** 6.3mag az: 48.4° NE horizon
	22h09m04s	NOSS 2-1 (E) (20642 1990-050-E) →Ground track →Star chart	**Appears** **22h00m40s** 11.5mag az:319.9° NW horizon **at Meridian** **22h07m07s** 7.0mag az: 0.0° N h:37.3° **Culmination** **22h09m04s** **6.2mag** az: 40.2° **NE** **h:45.8°** distance: 1476.0km height above Earth: 1129.6km elevation of Sun: -11° angular velocity: 0.28°/s **Disappears** **22h16m13s** 7.3mag az:110.2° ESE h:12.4°
	22h10m06s	Cosmos 1844 (17973 1987-041-A) →Ground track →Star chart	**Appears** **22h02m18s** 7.2mag az:188.4° S horizon **at Meridian** **22h05m47s** 6.1mag az:180.0° S h:15.6° **Culmination** **22h10m06s** **4.5mag** az:109.8° **ESE** **h:49.8°** distance: 1045.8km height above Earth: 831.0km elevation of Sun: -11° angular velocity: 0.42°/s **Disappears** **22h17m57s** 7.8mag az: 31.7° NNE horizon
	22h10m31s	Spot 1 r DebC (16615 1986-019-C) →Ground track →Star chart	**Appears** **22h05m31s** 6.1mag az:148.8° SSE h:10.8° **Culmination** **22h10m31s** **4.4mag** az: 70.4° **ENE** **h:60.3°** distance: 906.7km height above Earth: 802.1km elevation of Sun: -11° angular velocity: 0.49°/s **at Meridian** **22h13m21s** 6.6mag az: 0.0° N h:26.4° **Disappears** **22h18m01s** 9.1mag az:349.0° N horizon
	22h11m24s	USA 182/Lacrosse 5 (28646	**Appears** **22h04m05s** 10.3mag az:305.2° NW horizon **Culmination** **22h11m24s** **3.1mag** az:225.9° **SW**

		2005-016-A) →Ground track →Star chart	**h:51.4°** distance: 892.6km height above Earth: 720.1km elevation of Sun: -11° angular velocity: 0.47°/s **at Meridian 22h12m44s** 3.0mag az:180.0° S h:40.1° **Disappears 22h15m42s** 4.2mag az:152.8° SSE h:13.3°
	22h16m34s	ERBS (15354 1984-108-B) →Ground track →Star chart	**Appears 22h10m55s** 11.2mag az:308.6° NW horizon **at Meridian 22h15m52s** 5.1mag az: 0.0° N h:32.5° **Culmination 22h16m34s 4.4mag** az: 26.5° **NNE h:35.8°** distance: 751.2km height above Earth: 467.2km elevation of Sun: -12° angular velocity: 0.57°/s **Disappears 22h19m20s** 5.1mag az: 90.9° E h:13.8°
	22h17m54s	Cosmos 1844 Rocket (17974 1987-041-B) →Ground track →Star chart	**Appears 22h09m55s** 6.4mag az:200.2° SSW horizon **at Meridian 22h16m56s** 3.5mag az:180.0° S h:60.6° **Culmination 22h17m54s 3.3mag** az:114.3° **ESE h:77.2°** distance: 857.4km height above Earth: 839.0km elevation of Sun: -12° angular velocity: 0.51°/s **Disappears 22h25m59s** 6.9mag az: 28.9° NNE horizon
	22h20m11s	Cosmos 1340 Rocket (13068 1982-013-B) →Ground track →Star chart	**Appears 22h18m04s** 4.9mag az:139.5° SE h:17.8° **Culmination 22h20m11s 4.4mag** az: 92.2° **E h:28.7°** distance: 1008.6km height above Earth: 541.3km elevation of Sun: -12° angular velocity: 0.45°/s **Disappears 22h25m58s** 7.6mag az: 21.3° NNE horizon
	22h20m29s	Cosmos 1633 (15592 1985-020-A) →Ground track →Star chart	**Appears 22h18m54s** 4.6mag az:129.9° SE h:19.4° **Culmination 22h20m29s 4.3mag** az: 90.4° **E h:26.5°** distance: 971.7km height above Earth: 488.5km elevation of Sun: -13° angular velocity: 0.46°/s **Disappears 22h25m53s** 7.5mag az: 20.2° NNE horizon
	22h20m29s	Cosmos 2278 Rocket (23088 1994-023-B) →Ground track →Star chart	**Appears 22h12m35s** 5.7mag az:188.5° S horizon **at Meridian 22h16m10s** 4.5mag az:180.0° S h:16.1° **Culmination 22h20m29s 3.0mag** az:109.7° **ESE h:50.7°** distance: 1056.4km height above Earth: 848.8km elevation of Sun: -13° angular velocity: 0.42°/s **Disappears 22h28m27s** 6.4mag az: 31.5° NNE horizon
	22h21m10s	Cosmos 2082 Rocket (20625 1990-046-B) →Ground track →Star chart	**Appears 22h13m12s** 8.3mag az:335.6° NNW horizon **at Meridian 22h18m31s** 5.1mag az: 0.0° N h:26.8° **Culmination 22h21m10s 3.5mag** az: 54.7° **NE h:43.8°** distance: 1157.8km height above Earth: 849.6km elevation of Sun: -13° angular velocity: 0.36°/s **Disappears 22h25m10s** 4.3mag az:120.1° ESE h:17.4°
	22h22m59s	USA 3/Farrah 5 (15071 1984-065-C) →Ground track	**Appears 22h20m29s** 7.1mag az:127.2° SE h:18.5° **Culmination 22h22m59s 6.4mag** az: 71.4° **ENE h:35.5°** distance: 954.2km height above Earth: 597.7km elevation

		→Star chart	of Sun: -13° angular velocity: 0.47°/s **at Meridian 22h28m10s** 10.0mag az: 0.0° N h:3.9° **Disappears 22h29m07s** 10.5mag az:357.4° N horizon Time uncertainty of about 1 seconds
	22h23m16s	Cosmos 1455 Rocket (14033 1983-037-B) →Ground track →Star chart	**Appears 22h16m36s** 7.0mag az:194.4° SSW horizon **Culmination 22h23m16s 4.3mag** az:280.9° **W h:67.7°** distance: 678.6km height above Earth: 632.7km elevation of Sun: -13° angular velocity: 0.66°/s **at Meridian 22h26m05s** 6.5mag az: 0.0° N h:21.9° **Disappears 22h29m56s** 8.2mag az: 7.6° N horizon
	22h25m17s	Helios 2A Rocket (28499 2004-049-H) →Ground track →Star chart	**Appears 22h22m12s** 4.9mag az:128.4° SE h:18.1° **Culmination 22h25m17s 4.1mag** az: 68.0° **ENE h:39.8°** distance: 1029.6km height above Earth: 703.2km elevation of Sun: -13° angular velocity: 0.43°/s **at Meridian 22h29m40s** 7.1mag az: 0.0° N h:10.2° **Disappears 22h32m03s** 8.3mag az:353.0° N horizon
	22h27m23s	**Cosmos 2506 Rocket (40700 2015-029-B)** →Ground track →Star chart	**Appears 22h25m59s 3.3mag az:169.5° S h:23.4°** **at Meridian 22h27m00s 2.0mag az:180.0° S h:59.9°** **Culmination 22h27m23s 2.1mag az:255.8° WSW h:82.0°** **distance: 319.8km height above Earth: 317.1km elevation of Sun: -13° angular velocity: 1.42°/s** **Disappears 22h31m54s 8.0mag az:345.5° NNW horizon** **Time uncertainty of about 15 seconds**
	22h35m43s	ADEOS 2 H2A Rocket (27601 2002-056-E) →Ground track →Star chart	**Appears 22h33m00s** 4.3mag az:101.5° ESE h:15.7° **Culmination 22h35m43s 4.1mag** az: 61.5° **ENE h:23.6°** distance: 1588.7km height above Earth: 784.7km elevation of Sun: -14° angular velocity: 0.28°/s **at Meridian 22h41m29s** 7.0mag az: 0.0° N h:3.1° **Disappears 22h42m20s** 7.4mag az:356.7° N horizon
	22h41m10s	**Lacrosse 5 Rocket (28647 2005-016-B)** →Ground track →Star chart	**Appears 22h34m12s 6.0mag az:231.4° SW horizon** **Culmination 22h41m10s 2.2mag az:322.2° NW h:87.8°** **distance: 620.8km height above Earth: 620.8km elevation of Sun: -15° angular velocity: 0.71°/s** **at Meridian 22h41m13s 2.2mag az: 0.0° N h:87.2°** **Disappears 22h47m48s 5.6mag az: 53.1° NE horizon**
	22h42m10s	Cosmos 841 Rocket (09023 1976-069-B) →Ground track →Star chart	**Appears 22h34m34s** 7.1mag az:193.9° SSW horizon **at Meridian 22h40m32s** 4.6mag az:180.0° S h:44.0° **Culmination 22h42m10s 4.1mag** az:109.0° **ESE h:72.4°** distance: 814.2km height above Earth: 780.6km elevation of Sun: -15° angular velocity: 0.54°/s **Disappears 22h49m50s** 8.0mag az: 24.5° NNE horizon
	22h44m58s	Cosmos 1833 Rocket (17590	**Appears 22h36m58s** 9.1mag az:335.4° NNW horizon **at Meridian 22h42m23s** 5.6mag az: 0.0° N

	1987-027-B) →Ground track →Star chart	h:27.7° **Culmination 22h44m58s 4.0mag** az: 55.0° **NE h:45.0°** distance: 1136.0km height above Earth: 847.6km elevation of Sun: -16° angular velocity: 0.37°/s **Disappears 22h48m12s** 4.5mag az:116.1° ESE h:22.6°
22h49m57s	Cosmos 1356 Rocket (13154 1982-039-B) →Ground track →Star chart	**Appears 22h47m16s** 5.5mag az:176.3° S h:20.5° **Culmination 22h49m57s 4.0mag** az: 98.1° **E h:66.6°** distance: 623.8km height above Earth: 577.0km elevation of Sun: -16° angular velocity: 0.72°/s **Disappears 22h56m21s** 8.5mag az: 14.2° NNE horizon
22h52m01s	USA 234/FIA Radar 2 (38109 2012-014-A) →Ground track →Star chart	**Appears 22h42m59s** 6.8mag az: 53.5° NE horizon **Culmination 22h52m01s 3.9mag** az:138.9° **SE h:65.0°** distance: 1202.1km height above Earth: 1107.2km elevation of Sun: -16° angular velocity: 0.34°/s **at Meridian 22h52m59s** 4.0mag az:180.0° S h:58.1° **Disappears 23h01m00s** 6.9mag az:223.9° SW horizon
22h53m48s	Metop B	Flare from fixed mounted left looking ASCAT **Magnitude= 0.5mag** Azimuth=339.2° NNW altitude= 17.2° in constellation Ursa Major RA= 9h01.8m Dec=+55°15' Flare angle=3.83° **Flare center line, closest point** →MapIt: Longitude=7.699°E Latitude=+42.207° (WGS84) **Distance=634.7 km** Azimuth=155.6° SSE Peak Magnitude=-2.7mag Satellite above: longitude=6.1°W latitude=+60.6° height above Earth=829.3 km distance to satellite=1966.6 km Altitude of Sun=-16.6° This is an experimental flare prediction. Brightness estimate may be unreliable. Please report a successful observation (Object/site coordinates/date/measured time/accuracy/magnitude).
22h58m29s	Worldview 3 (40115 2014-048-A) →Ground track →Star chart	**Appears 22h57m07s** 4.2mag az:103.2° ESE h:26.6° **Culmination 22h58m29s 4.2mag** az: 67.5° **ENE h:32.9°** distance: 1041.6km height above Earth: 620.6km elevation of Sun: -17° angular velocity: 0.42°/s **at Meridian 23h03m10s** 7.5mag az: 0.0° N h:6.2° **Disappears 23h04m41s** 8.4mag az:355.0° N horizon
23h00m40s	**Resurs P1 (39186 2013-030-A)** →Ground track →Star chart	**Appears 22h59m54s 2.9mag az:122.3° ESE h:43.1°** **Culmination 23h00m40s 2.8mag az: 73.9° ENE h:55.2°** **distance: 559.2km height above Earth: 467.0km elevation of Sun: -17° angular velocity: 0.80°/s** **at Meridian 23h03m07s 5.9mag az: 0.0° N h:17.5°** **Disappears 23h06m09s 8.2mag az:351.9° N horizon**
23h02m32s	Spot 6 (38755 2012-047-A) →Ground track	**Appears 23h00m02s** 5.4mag az:161.4° SSE h:28.3° **Culmination 23h02m32s 4.4mag** az: 74.8° **ENE h:85.3°**

		→Star chart	distance: 706.5km height above Earth: 704.7km elevation of Sun: -18° angular velocity: 0.62°/s **at Meridian** **23h03m00s** 4.8mag az: 0.0° N h:72.6° **Disappears** **23h09m34s** 9.9mag az:347.2° NNW horizon
	23h02m46s	USA 29/DMSP 5D-2/F9 (18822 1988-006-A) →Ground track →Star chart	**Appears** **22h55m12s** 9.8mag az: 17.9° NNE horizon **Culmination** **23h02m46s** **5.9mag** az:100.4° **E** **h:53.5°** distance: 973.1km height above Earth: 805.7km elevation of Sun: -18° angular velocity: 0.43°/s **Disappears** **23h05m26s** 6.7mag az:165.5° SSE h:27.2°
	23h06m48s	Yaogan 9A (36413 2010-009-A) →Ground track →Star chart	**Appears** **22h57m09s** 11.8mag az:317.5° NW horizon **Culmination** **23h06m48s** **6.0mag** az:238.6° **WSW** **h:56.1°** distance: 1372.1km height above Earth: 1178.1km elevation of Sun: -18° angular velocity: 0.30°/s **at Meridian** **23h09m51s** 6.2mag az:180.0° S h:35.1° **Disappears** **23h11m40s** 6.7mag az:169.8° S h:22.4°
	23h06m56s	Yaogan 9B (36414 2010-009-B) →Ground track →Star chart	**Appears** **22h57m17s** 11.8mag az:317.3° NW horizon **Culmination** **23h06m56s** **6.1mag** az:239.0° **WSW** **h:54.2°** distance: 1398.4km height above Earth: 1179.1km elevation of Sun: -18° angular velocity: 0.29°/s **at Meridian** **23h10m15s** 6.3mag az:180.0° S h:32.4° **Disappears** **23h11m51s** 6.7mag az:171.3° S h:21.8°
	23h07m06s	Yaogan 9C (36415 2010-009-C) →Ground track →Star chart	**Appears** **22h57m27s** 11.8mag az:317.5° NW horizon **Culmination** **23h07m06s** **6.0mag** az:238.5° **WSW** **h:56.2°** distance: 1371.3km height above Earth: 1178.6km elevation of Sun: -18° angular velocity: 0.30°/s **at Meridian** **23h10m08s** 6.2mag az:180.0° S h:35.3° **Disappears** **23h11m57s** 6.7mag az:169.7° S h:22.5°
	23h07m09s	**Yaogan 18 Rocket (39364 2013-059-B)** →Ground track →Star chart	**Appears** **23h06m04s** **3.2mag** **az:140.1° SE** **h:42.9°** **Culmination** **23h07m09s** **2.9mag** **az: 74.4° ENE** **h:66.9°** **distance: 572.0km height above Earth: 530.1km elevation of Sun: -18° angular velocity: 0.78°/s** **at Meridian** **23h08m56s** **5.1mag** **az: 0.0° N** **h:29.3°** **Disappears** **23h12m59s** **8.5mag** **az:350.1° N** **horizon**
	23h07m33s	**Terra (25994 1999-068-A)** →Ground track →Star chart	**Appears** **23h05m46s** **3.2mag** **az:124.1° SE** **h:32.5°** **Culmination** **23h07m33s** **2.9mag** **az: 69.9° ENE** **h:49.4°** **distance: 901.7km height above Earth: 709.5km elevation of Sun: -18° angular velocity: 0.49°/s** **at Meridian** **23h11m09s** **5.8mag** **az: 0.0° N** **h:16.2°** **Disappears** **23h14m28s** **7.8mag** **az:351.2° N** **horizon**
	23h10m39s	SOYUZ-TMA 17M (40744 2015-035-A) →Ground track	**Appears** **23h05m20s** 10.4mag az:293.8° WNW horizon **Culmination** **23h10m39s** **4.2mag** az:205.9° **SSW** **h:83.2°** distance: 403.4km height above Earth: 401.1km elevation

		→Star chart	of Sun: -19° angular velocity: 1.10°/s **at Meridian 23h10m42s** 4.2mag az:180.0° S h:82.5° **Disappears 23h10m56s** 4.1mag az:136.5° SE h:71.1° Time uncertainty of about 4 minutes
	23h13m39s	USA 173-2/NOSS 3-2C (28097 2003-054-C) →Ground track →Star chart	**Appears 23h04m57s** 7.6mag az:242.9° WSW horizon **Culmination 23h13m39s 5.7mag** az:322.6° **NW h:46.3°** distance: 1346.4km height above Earth: 1032.5km elevation of Sun: -19° angular velocity: 0.32°/s **at Meridian 23h15m19s** 5.9mag az: 0.0° N h:39.1° **Disappears 23h23m14s** 7.7mag az: 42.0° NE horizon
	23h15m18s	Yaogan 21 (40143 2014-053-A) →Ground track →Star chart	**Appears 23h14m59s** 3.5mag az: 85.6° E h:38.5° **Culmination 23h15m18s 3.6mag** az: 71.3° **ENE h:39.5°** distance: 733.4km height above Earth: 490.2km elevation of Sun: -19° angular velocity: 0.61°/s **at Meridian 23h18m59s** 7.2mag az: 0.0° N h:8.3° **Disappears 23h20m49s** 8.5mag az:354.4° N horizon
	23h17m08s	**Progress M-28M (40713 2015-031-A)** →Ground track →Star chart	**Appears 23h11m49s 8.3mag az:293.8° WNW horizon** **Culmination 23h17m08s 2.2mag az:207.3° SSW h:75.6°** **distance: 416.2km height above Earth: 404.2km elevation of Sun: -19° angular velocity: 1.06°/s** **Disappears 23h17m12s 2.2mag az:193.4° SSW h:75.2°** **Time uncertainty of about 3 minutes**
	23h19m11s	USA 216/SBSS 1 (37168 2010-048-A) →Ground track →Star chart	**Appears 23h12m39s** 9.4mag az: 9.5° N horizon **at Meridian 23h16m31s** 7.6mag az: 0.0° N h:22.2° **Culmination 23h19m11s 5.5mag** az:287.7° **WNW h:58.6°** distance: 730.8km height above Earth: 634.6km elevation of Sun: -19° angular velocity: 0.57°/s **Disappears 23h22m51s** 6.8mag az:210.7° SSW h:13.9°
	23h20m17s	Cosmos 921 Rocket (10096 1977-055-B) →Ground track →Star chart	**Appears 23h13m55s** 9.8mag az:336.9° NNW horizon **Culmination 23h20m17s 4.0mag** az:254.6° **WSW h:59.4°** distance: 664.7km height above Earth: 580.7km elevation of Sun: -20° angular velocity: 0.64°/s **Disappears 23h21m44s** 4.2mag az:192.2° SSW h:36.5°
	23h23m09s	**Lacrosse 4 Rocket (26474 2000-047-B)** →Ground track →Star chart	**Appears 23h22m43s 2.1mag az:142.3° SE h:51.9°** **Culmination 23h23m09s 2.1mag az:116.8° ESE h:54.8°** **distance: 690.6km height above Earth: 576.3km elevation of Sun: -20° angular velocity: 0.65°/s** **Disappears 23h29m37s 6.1mag az: 35.8° NE horizon**
	23h23m11s	Cosmos 1346 (13120 1982-027-A) →Ground track →Star chart	**Appears 23h23m11s** 4.0mag az: 63.0° ENE h:63.1° **Disappears 23h28m11s** 8.9mag az: 14.0° NNE horizon

23h23m36s	Cosmos 389 Rocket (04814 1970-113-B) →Ground track →Star chart	**Appears** **23h17m48s** 9.1mag az:347.1° NNW horizon **Culmination** **23h23m36s** **3.2mag** az:260.4° **W** **h:78.7°** distance: 495.3km height above Earth: 486.7km elevation of Sun: -20° angular velocity: 0.86°/s **Disappears** **23h24m12s** 3.2mag az:189.9° S h:58.6°
23h24m17s	Rubin 2 Dnpr Rocket (27610 2002-058-F) →Ground track →Star chart	**Appears** **23h17m44s** 7.5mag az:218.0° SW horizon **Culmination** **23h24m17s** **4.3mag** az:308.1° **NW** **h:84.5°** distance: 646.0km height above Earth: 643.6km elevation of Sun: -20° angular velocity: 0.70°/s **at Meridian** **23h24m28s** 4.4mag az: 0.0° N h:81.1° **Disappears** **23h31m33s** 8.3mag az: 38.4° NE horizon
23h24m40s	Object 88A (40362 2014-088-A) →Ground track →Star chart	**Appears** **23h24m29s** 3.3mag az: 83.3° E h:46.8° **Culmination** **23h24m40s** **3.4mag** az: 72.4° **ENE** **h:47.3°** distance: 655.1km height above Earth: 496.4km elevation of Sun: -20° angular velocity: 0.68°/s **at Meridian** **23h27m46s** 6.8mag az: 0.0° N h:12.7° **Disappears** **23h30m17s** 8.6mag az:352.8° N horizon
23h25m53s	**SJ 11-03 Rocket (37731 2011-030-B)** →Ground track →Star chart	**Appears** **23h23m46s** **3.3mag** **az:189.6° S** **h:30.9°** **Culmination** **23h25m53s** **2.8mag** **az:259.1° W** **h:61.6°** **distance: 777.7km height above Earth: 694.0km elevation of Sun: -20° angular velocity: 0.56°/s** **Disappears** **23h32m52s** **8.2mag** **az:344.2° NNW** **horizon**
23h28m15s	USA 247/FIA Radar 3 (39462 2013-072-A) →Ground track →Star chart	**Appears** **23h24m41s** 7.1mag az:123.2° ESE h:30.0° **Culmination** **23h28m15s** **6.4mag** az: 34.6° **NE** **h:88.8°** distance: 1108.6km height above Earth: 1108.8km elevation of Sun: -20° angular velocity: 0.38°/s **at Meridian** **23h28m17s** 6.4mag az: 0.0° N h:88.5° **Disappears** **23h37m19s** 11.7mag az:306.7° NW horizon
23h30m13s	Pleiades 1B (39019 2012-068-A) →Ground track →Star chart	**Appears** **23h28m47s** 3.7mag az:151.9° SSE h:45.3° **Culmination** **23h30m13s** **3.4mag** az: 74.0° **ENE** **h:78.9°** distance: 716.3km height above Earth: 704.6km elevation of Sun: -21° angular velocity: 0.61°/s **at Meridian** **23h31m17s** 4.4mag az: 0.0° N h:53.6° **Disappears** **23h37m14s** 9.1mag az:347.8° NNW horizon
23h30m52s	ARGOS (25634 1999-008-A) →Ground track →Star chart	**Appears** **23h27m59s** 4.9mag az:190.6° S h:26.4° **Culmination** **23h30m52s** **4.3mag** az:259.1° **W** **h:56.7°** distance: 969.3km height above Earth: 830.3km elevation of Sun: -21° angular velocity: 0.45°/s **Disappears** **23h38m35s** 9.6mag az:342.6° NNW horizon
23h31m17s	USA 173/NOSS 3-2A	**Appears** **23h22m42s** 7.7mag az:253.3° WSW horizon **Culmination** **23h31m17s** **6.3mag** az:328.8° **NNW**

	(28095 2003-054-A) →Ground track →Star chart	**h:36.6°** distance: 1569.8km height above Earth: 1042.9km elevation of Sun: -21° angular velocity: 0.28°/s **at Meridian 23h33m05s** 6.4mag az: 0.0° N h:31.6° **Disappears 23h40m44s** 7.8mag az: 43.6° NE horizon
23h32m21s	 ISS →Ground track →Star chart	**Appears 23h27m34s** 1.6mag az:293.3° WNW horizon **Disappears 23h32m21s** -3.5mag az:253.6° WSW h:49.6° 
23h33m23.56s	 ISS	**Close to Altair, Alp Aql (SAO 125122, HIP 97649 HD187642), Magnitude=0.8mag.** Separation=1.190° Position Angle=207.9°, Position angle vertex=217.5° Angular diameter=53.2" size=109.0m x 73.0m x 27.5m Satellite at Azimuth=167.0° SSE Altitude= 49.8° Distance=520.0 km **(in shadow)** In a clock-face concept, the satellite will seem to move toward 7:45 Angular Velocity=44.4'/s **Centerline, closest point** →Map: Longitude= 4°25'47"E Latitude=+47°21'32" (WGS84) **Distance=12.44 km** Azimuth=211.1° SSW Path direction=120.8° ESE ground speed=7.492 km/s Sun elevation=-21° Elongation from Sun=146° Orbit source: NASA predicted orbit

66 Items/Events: Export to Outlook/iCal Print E-mail
Used satellite data set is from 12 August 2015

Hide glossary

Glossary:

Altitude/alt/h
Angular separation of the object from the local mathematical horizon. This accounts for refraction as well.

Appears
Local time at which the satellite appears visually. The first figure indicates the **visual brightness** of the object. The smaller the number, the brighter and more eye-catching it appears to an observer. The units are astronomical magnitudes [m]. **Azimuth** is given in degrees counting from geographic north clockwise to the east direction. The three-character direction code is given as well. In case the satellite exits from the Earth shadow and comes into the glare of the Sun, the elevation above horizon is given in degrees for this event. If this figure is omitted, the satellite is visible straight from the horizon.

at Meridian
Time of the transit of the meridian, i.e. the satellite is due South or due North. At this time, the satellite will not reach its highest point of the pass. Look for culmination.

Azimuth/az
Azimuth direction of the object is given in degrees counting from geographic north (0°) clockwise to the east direction. East is 90°, south 180°, and west 270°. The three-character direction code is given as well. For example, NNW stands for north-north-west.

Close to Moon/Sun
The satellite is closer than 1.5 degrees from the center of the Moon or the Sun, but the satellite does not cross in front of the Moon/Sun. The direction and distance to the center line on Earth is given. *For the Sun, move to the indicated center line position and observer with proper equipment. By no means observe the Sun without special filters!*

Close to...
The Moon or main object appears close to the listed star or planet. These events may be useful for reasons of 'near miss' or to make it easier to find the fainter object in the sky. Usually, such constellations give a nice view.

Clock-face Direction

In a simple clock-face coordinate system with the clock face superimposed on the satellite itself, with 12:00 o'clock being at the top and 9:00 o'clock being at the left, the satellite will seem to move toward the given direction. This number is helpful when observing with binoculars.

Culmination

Time at which the satellite reaches his highest point in the sky as seen from the observer. For description of the figures see **Appears**.
Visually "better" passes of satellites are indicated by highlighting the information. The selection within the list of all possible transits is coupled with the observer level, the daylight, and several other conditions.

Dec., declination, DE

One coordinate used to indicate the position on the sky. It is the angular distance of the object from the celestial equator. North pole, close to Polaris, is 90° north.

Disappears

Local time of visual disappearance of the satellite. This may either be the time at which the satellite moves below the observer's horizon or the entry of the object in the shadow of Earth (the elevation is given for this event). The low Earth orbiting (LEO) satellites are usually visible for about 10 seconds more than the listed time, when they start fading rapidly.

Elongation

The elongation is the angular separation a celestial body and the central body (Sun, for moons: Jupiter or Saturn), as seen from the Earth mass center.

Flare angle

The angle between the direction of the mirrored image of the Sun and the observer. For bright flares, this angle must be as small as possible (i.e., the observer should be as close to the center line as possible).

Flare

The communication antennas and the solar panels reflect the sunlight almost as a perfect mirror. In case the observer lays within this reflected beam, the satellite suddenly appears very bright, as bright as the Moon in the first quarter; the light is even strong enough to cast shadows. Since the sunlight is bundled, the duration of the whole event is short, and lasts about 10 seconds. The indicated time is the center of the flare event; hence the satellite can be spotted some seconds earlier. Due to the shortness of the event, it is important to look in the right direction at the right time.

International Space Station ISS

The manned ISS is according to NASA the biggest and most complex scientific project in history. During twilight passed, the space station is easily seen by everyone as a strikingly bright and silently running star. It crosses the sky in a few minutes basically from west to east.

Iridium

Wireless worldwide communication system, which consists of 66 satellites that are in low Earth orbits. The user who has a rather small phone directly contacts one of the satellites, i.e., one of the three **Main Mission Antennas MMA** (the three panels in the bottom of the image with a size of about 1x2m^2). The satellites constellation consists of 6 planes with 11 satellites each (and some spares). Hence, another Iridium satellite passes at about the same place in the sky every 8 minutes.

Magnitude/Mag

Brightness of an object considered as a point source of light, on a logarithmic scale.\ Visual limiting magnitude is about 6mag, whereas the brightest star Sirius reaches -1.4mag. The Hubble Space Telescope can image objects as dim as 29mag.

Position Angle rel. Vertex

Angle, defining a position on an apparent disk. It is counted around the reference points (center of disk) from local up, *zenith* direction 0° to east (left) 90°, south 180° to west (right) 270° in counter clockwise direction.

Position Angle / PA

Angle, defining a position on an apparent disk or the position of e.g. a dimmer star (or the anti-solar point for lunar eclipses) with regard of the main star or the center of disk. It is counted around the reference points (center of disk/brighter star) from *celestial north* direction 0° to east (left) 90°, south 180° to west (right) 270° in counter clockwise direction.

R.A., right ascension, RA

One coordinate used to indicate the position on the sphere. It is the angular distance of the object from the spring equinox measured along the celestial equator, expressed in hours of arc.

Radius

Distance of the celestial body from main central body (Earth for the Moon, the Sun otherwise). For the Moon the unit is Earth radii (ER), otherwise Astronomical Unit (AU), the mean distance between the Sun and Earth.

Sat above

Geographic coordinates of the sub-satellite point (in WGS84 coordinates). This is the point on Earth, from which the satellite is in the zenith at the indicated time. The altitude of the satellite from this point is given

as "**alt**".

Separation

Angular distance between the centers of disks of two objects. For eclipses: the Sun and the Moon. For occultations: Moon/satellite and Star/Planet. For binary stars: Star/Star

Time and Date

Date of validity of calculated output in local time and date, taking into account daylight saving time as well (see the current time zone on the left of the Earth icon on top right of almost all pages). The time is given as hours:minutes:seconds, or 00h00m00s. The time may also be rounded and given in decimal form, in order to correspond to the accuracy of the calculation: e.g., 10.1h means that the event will take place at about 5 minutes past 10 o'clock. This may also happen for days: 4.3d corresponds to the fourth day at around 7 o'clock. The start time is taken as selected by you, i.e., this is *not* necessarily at midnight. For intervals shorter than one day, decimal days are given. Times are given in 24 hour format (0h00m is midnight, 12h: noon, 18h: 6 pm.)

WGS84 / Geographical Coordinates

Geographical coordinates are given by the angles longitude (Lon), latitude (Lat), and altitude in meters (Alt). A place north of the equator at marked by N or +, places south of the equator by S or -. The longitude from the meridian of Greenwich is counted positive towards east (E). Places west from Greenwich are marked W or by -. The geographical coordinates refer to an ellipsoid, which fits the true shape of the Earth (geoid). The geoid corresponds to calm sea surface. The keyword "Geographic:" uses the local ellipsoid as reference system. WGS84 mark coordinates referring to the WGS84 ellipsoid. The difference in altitude to the geoid sums up to 100 meters and is called geoid undulation. This is corrected for when tagged "MSL" (mean sea level), such that the origin of the height system is at sea level.

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Create new default account/Logout

Software Version: 28 September 2015
Database updated 2 min ago
Current Users: 150, Runtime: 2.5s

28 Sep 2015, 10:35 UTC
597 minutes left for this session
17 days left in ad-free mode