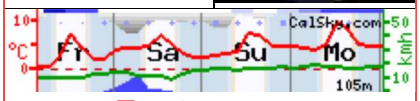
Select start of calculation:
Date: 2 August 2013
Time: 23 : 50 : 00 . 00 in TDT Now
Select duration: 30 Minutes go!

geipan
Vincelles, France
Easting: 3.6333
Northing: 47.7033
Time zone: CET/ CEST
Astronomer



Weather · Sat-Image

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 Streams
- ☑ 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
- ☑ Sun and Moon
- ☑ Planets
- ☐ Asteroids
- ☐ Comets
- ☐ Meteor Streams
- ☐ 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
- ☐ Milky Way
- ☐ Galaxies
- ☐ Open Star Clusters
- ☐ Globular Star Clusters
- ☐ Nebula

go!

Friday 2 August 2013

Time (24-hour clock)	Object (Link)	Event
	Observer Site	Vincelles, France WGS84: Lon: +3d38m00.05s Lat: +47d42m11.96s Alt: 152m All times in CET or CEST (during summer)
23h50m00s	NOSS 3-3 Rocket (28538 2005-004-B) →Ground track →Star chart	**Appears** **23h37m54s** 4.9mag az:182.0° S h:18.7° **at Meridian** **23h38m20s** 4.7mag az:180.0° S h:21.0° **Culmination** **23h43m10s** **3.9mag** az:117.2° **ESE** **h:47.6°** distance: 1568.9km height above Earth: 1232.8km elevation of Sun: -19° angular velocity: 0.27°/s **Disappears** **23h53m32s** 7.0mag az: 42.1° NE horizon

23h50m00s	IGS 5 (36104 2009-066-A) →Ground track →Star chart	**Appears** **23h43m26s** 4.6mag az:172.6° S h:39.2° **at Meridian** **23h44m15s** 4.1mag az:180.0° S h:61.2° **Culmination** **23h44m56s** **4.1mag** az:256.7° **WSW** **h:82.8°** distance: 599.8km height above Earth: 595.6km elevation of Sun: -19° angular velocity: 0.74°/s **Disappears** **23h51m18s** 10.3mag az:346.6° NNW horizon
23.8h	Saturn	Magnitude= 0.7mag Best seen from 21.5h - 0.4h (h_{top}=24° at SW at 21.5h) (in constellation Virgo) RA=14h14m43s Dec=-11°00.9' (J2000) Distance=9.889AU Elongation= 85° Diameter=16.7" planetocentric latitude of the Earth=17.4°
23.8h	Pluto	Magnitude=14.1mag Best seen from 23.1h - 1.0h (h_{top}=22° at S at 23.7h) (in constellation Sagittarius) RA=18h39m42s Dec=-19°57.4' (J2000) Distance=31.613AU Elongation=149° Diameter=0.1"
23.8h	**Deep-Sky Observing**	**Best time interval for observing dim objects: 23.1h- 4.6h** **Prior to midnight**
23h51m55s	USA 209/STSS Demo SV-2 (35938 2009-052-B) →Ground track →Star chart	**Appears** **23h40m48s** 8.9mag az:218.4° SW horizon **at Meridian** **23h50m55s** 6.3mag az:180.0° S h:66.2° **Culmination** **23h51m55s** **6.2mag** az:134.5° **SE** **h:72.9°** distance: 1405.8km height above Earth: 1355.1km elevation of Sun: -19° angular velocity: 0.30°/s **Disappears** **0h03m08s** 9.4mag az: 51.3° NE horizon
23h52m48s	Iridium 41	Flare from MMA0 (Front antenna) **Magnitude=-5.4mag** Azimuth=280.4° W altitude= 11.6° in constellation Coma Berenices RA=12h55.0m Dec=+15°30' Flare angle=0.05° **Flare center line, closest point** →MapIt: Longitude=3.752°E Latitude=+47.717° (WGS84) **Distance=9.0 km** Azimuth= 80.2° E Peak Magnitude=-5.5mag Satellite above: longitude=22.9°W latitude=+47.9° height above Earth=784.5 km distance to satellite=2227.3 km Altitude of Sun=-19.5°
23h52m55s	**Iridium 20**	**Flare from MMA1 (Right antenna) Magnitude= 1.8mag** **Azimuth= 29.9° NNE altitude= 14.0° in constellation Perseus** **RA= 3h48.3m Dec=+48°12'** **Flare angle=1.86°** **Flare center line, closest point** →MapIt: **Longitude=5.085°E** **Latitude=+47.557° (WGS84) Distance=109.9 km Azimuth= 98.0° E Peak Magnitude=-5.8mag** **Satellite above: longitude=20.5°E latitude=+59.4° height above Earth=786.4 km distance to satellite=2069.6 km** **Altitude of Sun=-19.6°**
23.9h	Uranus	Magnitude= 5.8mag Best seen from 23.9h - 5.1h (h_{top}=46° at SSE at 5.1h) (in constellation Pisces) RA= 0h46m05s Dec= +4°10.4' (J2000) Distance=19.543AU Elongation=118° Diameter=3.6"

Saturday 3 August 2013

Time (24-hour clock)	Object (Link)	Event
0h00m52s	**Lacrosse 4 Rocket (26474 2000-047-B)** →Ground track →Star chart	**Appears** **23h54m30s** **8.7mag** **az:328.1° NNW** horizon **at Meridian** **0h00m28s** **2.4mag** **az: 0.0° N** h:69.4° **Culmination** **0h00m52s** **2.0mag** **az: 57.2° ENE** **h:78.5°** **distance: 587.0km height above Earth: 576.4km elevation of Sun: -20° angular velocity: 0.73°/s**

		Disappears 0h01m47s 2.1mag az:131.3° SE h:53.3°
0h02m02s	Iridium 43	Flare from MMA0 (Front antenna) **Magnitude=-1.5mag** Azimuth=282.3° WNW altitude= 9.5° in constellation Coma Berenices RA=12h52.7m Dec=+15°14' Flare angle=0.77° **Flare center line, closest point** →MapIt: Longitude=1.488°E Latitude=+47.538° (WGS84) **Distance=161.7 km** Azimuth=264.3° W Peak Magnitude=-5.5mag Satellite above: longitude=25.1°W latitude=+47.6° height above Earth=784.2 km distance to satellite=2381.8 km Altitude of Sun=-20.3°
0h02m36s	Iridium 49	Flare from MMA1 (Right antenna) **Magnitude=-0.9mag** Azimuth= 32.3° NNE altitude= 17.9° in constellation Perseus RA= 3h33.4m Dec=+50°15' Flare angle=1.09° **Flare center line, closest point** →MapIt: Longitude=2.850°E Latitude=+47.780° (WGS84) **Distance=59.2 km** Azimuth=278.6° W Peak Magnitude=-5.8mag Satellite above: longitude=18.2°E latitude=+59.7° height above Earth=786.5 km distance to satellite=1849.3 km Altitude of Sun=-20.3°
0h03m56s	USA 208/STSS Demo SV-1 (35937 2009-052-A) →Ground track →Star chart	**Appears 23h52m46s** 8.9mag az:222.6° SW horizon **at Meridian 0h03m25s** 6.3mag az:180.0° S h:77.0° **Culmination 0h03m56s 6.3mag** az:136.8° **SE h:80.5°** distance: 1372.2km height above Earth: 1356.9km elevation of Sun: -20° angular velocity: 0.31°/s **Disappears 0h15m11s** 9.5mag az: 51.6° NE horizon
0h06m33.30s	ISS	**Close to Altair, Alp Aql (SAO 125122, HIP 97649 HD187642), Magnitude=0.8mag**. Separation=0.989° Position Angle=157.0°, Position angle vertex=168.5° Angular diameter=50.6" size=109.0m x 73.0m x 27.5m Satellite at Azimuth=162.7° SSE Altitude= 49.2° Distance=546.6 km **(in shadow)** In a clock-face concept, the satellite will seem to move toward 9:23 Angular Velocity=45.8'/s **Centerline, closest point** →Map: Longitude= 3°43'11"E Latitude=+47°36'38" (WGS84) **Distance=12.16 km** Azimuth=147.9° SSE Path direction= 57.7° ENE ground speed=7.415 km/s Sun elevation=-21° Elongation from Sun=149°
0h09m15s	Cosmos 2428 Rocket (31793 2007-029-B) →Ground track →Star chart	**Appears 0h01m20s** 9.1mag az:327.7° NNW horizon **Culmination 0h09m15s 3.6mag** az:251.3° **WSW h:45.7°** distance: 1130.7km height above Earth: 852.6km elevation of Sun: -21° angular velocity: 0.37°/s **Disappears 0h11m36s** 3.7mag az:198.9° SSW h:29.7°
0h11m18s	Iridium 18	Flare from MMA0 (Front antenna) **Magnitude=-0.8mag** Azimuth=284.2° WNW altitude= 7.6° in constellation Coma Berenices RA=12h51.0m Dec=+15°08' Flare angle=1.43°

		Flare center line, closest point →MapIt: Longitude=0.750°W Latitude=+47.319° (WGS84) **Distance=331.7 km** Azimuth=264.2° W Peak Magnitude=-5.5mag Satellite above: longitude=27.4°W latitude=+47.3° height above Earth=784.3 km distance to satellite=2534.3 km Altitude of Sun=-21.0°
0h12m30s	Cosmos 1689 Rocket (16111 1985-090-B) →Ground track →Star chart	**Appears** **0h12m13s** 3.5mag az:238.1° WSW h:52.0° **Culmination** **0h12m30s** **3.6mag** az:259.6° **W** **h:54.1°** distance: 573.6km height above Earth: 472.7km elevation of Sun: -21° angular velocity: 0.78°/s **Disappears** **0h18m00s** 9.7mag az:343.5° NNW horizon
0h14m19s	USA 219/O/OREOS (37224 2010-062-C) →Ground track →Star chart	**Appears** **0h07m27s** 11.8mag az:330.4° NNW horizon **Culmination** **0h14m19s** **5.7mag** az:249.8° **WSW** **h:55.6°** distance: 778.9km height above Earth: 656.6km elevation of Sun: -21° angular velocity: 0.55°/s **Disappears** **0h15m26s** 5.7mag az:201.6° SSW h:43.6° Time uncertainty of about 75 minutes
0h18m59s	Cosmos 2322 (23704 1995-058-A) →Ground track →Star chart	**Appears** **0h10m53s** 10.5mag az:330.2° NNW horizon **Culmination** **0h18m59s** **4.5mag** az:247.0° **WSW** **h:67.9°** distance: 912.0km height above Earth: 853.3km elevation of Sun: -22° angular velocity: 0.46°/s **at Meridian** **0h20m51s** 4.7mag az:180.0° S h:42.1° **Disappears** **0h20m53s** 4.7mag az:179.8° S h:41.8°

20 Items/Events: Export to Outlook/iCal Print E-mail

Used satellite data set is from 3 August 2013

☐ 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 t he 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.

Best seen between / h_{max}
This is the best visibility time interval of the object, and the time is rounded to the next decimal hour; e.g. 6.4h corresponds to about 6:15 (hh:mm) to 6:20, and 18.9h to about 18:50 to 18:55. The calculation takes into account the magnitude of the object (required elevation above horizon), and the elevation of the Sun. The time is given in local civil time (LCT), i.e., the time zone and definitions as selected by you. h_{max} is the maximum altitude over the horizon, that the object reaches during this time period.

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.

Diameter
Diameter is the geocentric apparent angular diameter of a celestial object (topocentric for artificial satellites). The value is given in seconds of arc for planets and satellites, and in minutes of arc for Sun and Moon.

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.

J2000, precession, nutation
The plains of ecliptic and equator shift with time by perturbations from the Sun, Moon and planets. The long-term shift is called precession; the short periodic variations are called nutation. The given celestial coordinates are referred to the true direction of the vernal equinox and the true obliquity of the ecliptic to the standard reference time 1 January 2000. For this date many star charts and coordinate tables are printed.

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 coun ter 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.

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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