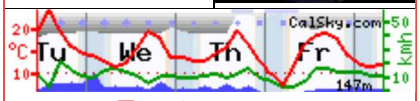
Select start of calculation:
Date: 14 June 2013
Time: 22 : 45 : 00 Now
Select duration: 1 Hour go!

geipan
Rangueil, France
Easting: 1.4811
Northing: 43.5622
Time zone: CET/ CEST
Hobby



Weather · Sat-Image
Local Sponsors: Your name?

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 (*7 days*, 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 14 June 2013

Time (24-hour clock)	Object (Link)	Event
	Observer Site	**Rangueil, France** **WGS84: Lon: +1d28m52.29s Lat: +43d33m44.05s Alt: 196m** **All times in CET or CEST (during summer)**
22h45m00s	Cosmos 1939 (19045 1988-032-A) →Ground track →Star chart	**Appears 22h41m09s** 5.6mag az:161.2° SSE h:11.5° **Culmination 22h44m12s 3.5mag** az: 76.3° **ENE h:74.8°** distance: 451.9km height above Earth: 437.4km elevation of Sun: -10° angular velocity: 0.97°/s **at Meridian 22h45m16s** 5.2mag az: 0.0° N h:39.6° **Disappears 22h49m31s** 9.3mag az:350.0° N horizon

22h45m00s	Lacrosse 5 Rocket (28647 2005-016-B) →Ground track →Star chart	**Appears 22h33m06s** 6.1mag az:235.8° SW horizon **Culmination 22h40m16s 3.3mag** az:320.9° **NW h:62.7°** distance: 750.1km height above Earth: 674.9km elevation of Sun: -10° angular velocity: 0.55°/s **at Meridian 22h40m55s** 3.3mag az: 0.0° N h:56.2° **Disappears 22h47m20s** 5.9mag az: 46.4° NE horizon
22.8h	**Mercury**	**Magnitude= 0.7mag Best seen from 22.2h -23.2h (h_{top}=10° at WNW at 22.2h) (in constellation Gemini)** **RA= 7h17m58s Dec=+23°01.1' (J2000) Distance=0.785AU** **Elongation= 24° Phase k=33% Diameter=8.6"**
22.8h	**Venus**	**Magnitude=-3.9mag Best seen from 21.6h -23.1h (h_{top}=14° at WNW at 21.6h) (in constellation Gemini)** **RA= 7h02m13s Dec=+23°58.5' (J2000) Distance=1.576AU** **Elongation= 20° Phase k=93% Diameter=10.6"**
22.8h	**Saturn**	**Magnitude= 0.4mag Best seen from 22.2h - 3.9h (h_{top}=36° at S at 22.6h) (in constellation Virgo)** **RA=14h14m37s Dec=-10°46.8' (J2000) Distance=9.134AU** **Elongation=131° Diameter=18.1" planetocentric latitude of the Earth=17.2°**
22h54m04s	**ISS** →Ground track →Star chart	**Appears 22h49m03s 2.7mag az:298.2° WNW horizon** **at Meridian 22h53m48s -1.0mag az: 0.0° N h:20.5°** **Culmination 22h54m04s -1.2mag az: 7.1° N h:20.7°** **distance: 993.8km height above Earth: 414.1km elevation of Sun: -11° angular velocity: 0.42°/s** **Disappears 22h59m02s -0.6mag az: 75.7° ENE h:0.6°**
22h57m23s	USA 120/NOSS 2-3C (23908 1996-029-C) →Ground track →Star chart	**Appears 22h50m48s** 7.3mag az:185.0° S h:2.4° **at Meridian 22h52m09s** 6.9mag az:180.0° S h:7.7° **Culmination 22h57m23s 5.5mag** az:113.7° **ESE h:33.9°** distance: 1344.1km height above Earth: 835.8km elevation of Sun: -12° angular velocity: 0.31°/s **Disappears 23h05m35s** 8.5mag az: 43.1° NE horizon
22h59m	**Sun**	**Dusk**
23.0h	**Moon**	**Earthshine**
23h02m	Occultation of star by (407) Arachne	**Asteroid (407) Arachne, 12.5 mag, occults TYC 6823-01095-1, 10.2 mag** Duration: 8.4 seconds. Magnitude drop: 2.4 mag. Visibility: India, Africa, Europe; Altitude=9.7° Azimuth=148.9° (Source: asteroidoccultation.com)
23h07.6m	**Venus**	**Set Azimuth=304.7°, NW (in constellation Gemini)**
23h14m12s	Cosmos 1222 Rocket (12072 1980-093-B) →Ground track →Star chart	**Appears 23h08m44s** 8.9mag az:352.1° N horizon **at Meridian 23h12m07s** 6.1mag az: 0.0° N h:21.4° **Culmination 23h14m12s 3.0mag** az: 78.8° **E h:66.2°** distance: 477.8km height above Earth: 440.2km elevation of Sun: -14° angular velocity: 0.91°/s **Disappears 23h15m57s** 4.1mag az:155.7° SSE h:25.5°
23h17m35s	ALOS (28931 2006-002-A) →Ground track →Star chart	**Appears 23h13m55s** 4.5mag az:169.1° S h:16.9° **at Meridian 23h16m48s** 3.0mag az:180.0° S h:61.9° **Culmination 23h17m35s 3.0mag** az:256.8° **WSW h:83.1°** distance: 702.9km height above Earth: 698.4km elevation of Sun: -14° angular velocity: 0.62°/s **Disappears 23h24m34s** 8.9mag az:346.8° NNW horizon
23h18.5m	Mercury	Set Azimuth=303.3°, WNW (in constellation Gemini)
23h18m31s	USA 194/NOSS 3-4A (31701	**Appears 23h12m04s** 6.2mag az:181.0° S h:8.6° **at Meridian 23h12m21s** 6.2mag az:180.0° S h:9.8°

	2007-027-A) →Ground track →Star chart	**Culmination 23h18m31s 4.8mag** az:114.9° **ESE h:37.4°** distance: 1554.5km height above Earth: 1047.3km elevation of Sun: -14° angular velocity: 0.27°/s **Disappears 23h27m24s** 7.7mag az: 42.9° NE horizon
23h18m37s	USA 194-2/NOSS 3-4C (31708 2007-027-C) →Ground track →Star chart	**Appears 23h12m17s** 6.2mag az:180.3° S h:9.0° **at Meridian 23h12m22s** 6.2mag az:180.0° S h:9.4° **Culmination 23h18m37s 4.8mag** az:114.8° **ESE h:37.1°** distance: 1564.0km height above Earth: 1048.2km elevation of Sun: -14° angular velocity: 0.26°/s **Disappears 23h27m29s** 7.7mag az: 43.0° NE horizon
23h20m59s	USA 173/NOSS 3-2A (28095 2003-054-A) →Ground track →Star chart	**Appears 23h11m10s** 11.3mag az:324.1° NW horizon **at Meridian 23h18m59s** 6.1mag az: 0.0° N h:43.3° **Culmination 23h20m59s 5.1mag** az: 46.6° **NE h:54.7°** distance: 1399.7km height above Earth: 1185.5km elevation of Sun: -14° angular velocity: 0.29°/s **Disappears 23h27m02s** 6.0mag az:120.0° ESE h:16.2°
23h23m22s	**USA 240/OTV-3/X-37B (39025 2012-071-A)** →Ground track →Star chart	**Appears 23h18m05s 7.4mag az:275.9° W horizon** **Culmination 23h23m22s 2.2mag az:187.9° S h:82.3°** **distance: 396.1km height above Earth: 393.0km elevation of Sun: -15° angular velocity: 1.06°/s** **at Meridian 23h23m23s 2.2mag az:180.0° S h:82.3°** **Disappears 23h25m04s 3.5mag az:102.4° ESE h:25.0°**
23h23m53s	Cosmos 2322 Rocket (23705 1995-058-B) →Ground track →Star chart	**Appears 23h20m29s** 4.1mag az:161.4° SSE h:19.1° **Culmination 23h23m53s 3.4mag** az:105.5° **ESE h:37.4°** distance: 1269.2km height above Earth: 841.1km elevation of Sun: -15° angular velocity: 0.33°/s **Disappears 23h31m37s** 6.7mag az: 32.5° NNE horizon
23h25m24s	USA 102/Darpasat (23031 1994-017-B) →Ground track →Star chart	**Appears 23h24m01s** 5.3mag az:136.0° SE h:30.2° **Culmination 23h25m24s 4.6mag** az: 64.7° **ENE h:63.1°** distance: 480.5km height above Earth: 432.0km elevation of Sun: -15° angular velocity: 0.93°/s **at Meridian 23h26m23s** 6.3mag az: 0.0° N h:38.9° **Disappears 23h30m37s** 11.3mag az:340.7° NNW horizon Time uncertainty of about 30 minutes
23h26m	Sun	Sun 15° below horizon
23.4h	**Deep-Sky Observing**	**Best time interval for observing dim objects: 23.4h- 4.4h Prior to midnight**
23h35m39s	USA 173-2/NOSS 3-2C (28097 2003-054-C) →Ground track →Star chart	**Appears 23h25m44s** 11.1mag az:323.8° NW horizon **at Meridian 23h34m05s** 5.6mag az: 0.0° N h:52.6° **Culmination 23h35m39s 4.9mag** az: 49.1° **NE h:63.8°** distance: 1300.7km height above Earth: 1188.8km elevation of Sun: -16° angular velocity: 0.31°/s **Disappears 23h41m10s** 5.8mag az:126.1° SE h:19.9°
23h36m59s	**Iridium 5**	**Flare from MMA0 (Front antenna) Magnitude=-4.7mag Azimuth=264.0° W altitude= 24.0° in constellation Leo** **Flare angle=0.35°** **Flare center line, closest point →MapIt: Longitude=1.200°E Latitude=+43.567° (WGS84) Distance=22.7 km Azimuth=271.4° W** **Satellite above: longitude=13.9°W latitude=+41.3° height above Earth=783.1 km distance to satellite=1570.0 km** **Altitude of Sun=-16.1°**

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

☐ 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.

Asteroid
Solid body which revolves around the Sun and it is neither a planet, nor a comet. More casually: in the solar system thousands, if not even hundreds of thousands of mountain-large to mountain-range large floating rocks. Particularly many gather between Mars and Jupiter. In addition, beyond the orbit of Neptune a gigantic supply of such bodies seem to exist.

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.

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.

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.

Dawn and Dusk: nautical Twilight
In CalSky, is taken as the moments of nautical twilight, i.e., the moments the Sun reaches a depression of 12° below the horizon. Not astronomically trained people will recognize the brightening of the horizon at these times.

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.

Duration
Duration of the umbral phase at the geographical point given (WGS84).

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.

Occultation
As the Moon moves along the ecliptic in a month, it happens to cover stars and sometimes planets. Observations of such events are impressive, since stars disappear suddenly, whereas planets (due to a considerable apparent diameter) hide away slowly.

Phase
Ratio of the illuminated fraction of the apparent planetary or lunar disk to its entire area.

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**".

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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