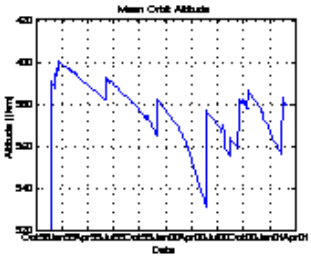
Select start of calculation:

Date: 23 April 2013

Time: 21 : 28 : 10 Now

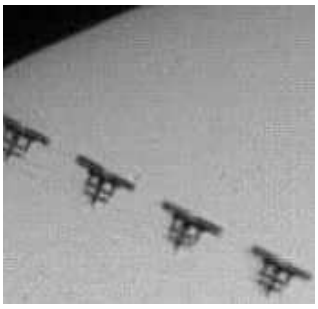
Select duration: 10 Minutes go!

(Duration automatically extended to 3 days, in order to show some data.)



ISS mean orbital altitude: only the regular orbit maintanance through thruster firings can yield a 'stable' orbit throughout the years (© CalSky / A. Barmettler)

Assembly state of ISS as of 2010 (NASA).



Solar Transit of ISS captured at August 16, 2003. © Roland Stalder from Lucerne, Switzerland.

Visibility of International Space Station ISS

The International Space Station ISS is the queen of the satellites. Since fall 2000 the ISS is manned. It makes an incredible sight when it passes sunlit overhead.

On this page you find the accurate time and position predictions in order not to miss the show. You find even the times and places for transits of ISS across the disk of sun or moon, and occulatations or close encounters with planets or bright stars.

You can also be alerted automatically of ISS passes or transits using CalSky's E-mail Alert service. Simply fill out the form given on the previous link and click 'Go'.

- 2-day map where ISS crosses the Sun in Google Map
- 2-day map where ISS crosses the Moon in Google Map

```
Name:          ISS
Launched:      20 Nov 1998
Dimensions:    109 m x 73 m x 27.5 m
Brightness:    -2.0 mag (at 1000 km, 50% illuminated)
               -4.7 mag (at perigee, full illumination)
               Mean magnitude from visual observations
RCS:           402m2 (Radar cross section)
USSPACECOM Nr: 25544    Internat. Designator: 1998-067A
Orbit:         403.4 x 417 km, 92.8min  Inclination: 51.6°
Age Elements:  0.3 days (based on 1 day old data; NASA.
               Planned orbit boosts are taken into account)
```

Satellite Menu

· Info · Orbit History/Zoom
· Sighting Opportunities
· Data & view of the Earth
· Finder Chart
· Ground Track Map
· Transit Centerline
· Orbit Elements (TLE)
· Predicted TLEs

Orbit calculations are based on the valid segment of 165 different orbital segments (orbital data above shown for the beginning of the segment containing the selected start time).

Select satellite events for your location

☑ **Show satellite passes**

☐ **Show invisible passes:** Calculate all passes, day or night, even if not optically visible

Auto **Minimum elevation:** Show satellite passes with at least this altitude above horizon

Automatic **Maximum sun elevation:** Sun must be below this altitude limit during the satellite pass

Additional filters are available in the highest user level

☑ **Close fly-bys of satellite with sun, moon, planets, and stars**

Maximum angular separation from Sun/Moon/planets/stars for close encounters: ◉ 1½° ○ 5° ○ 10° ○ .5°

or

Maximum distance to center line: ○ 5 km ○ 10 ○ 15 ○ 25 ○ 50 ○ 100 ○ 250 km

☐ **Only transits:** Calculate and display sun/moon/planet/star **crossers only, but no close encounters**

☐ **Only Sun/Moon events:** Display **transits/encounters only with the Sun or Moon**, but not with planets and stars

☐ **Satellite must be illuminated:** Display only transit/encounter events where the satellite is illuminated by the Sun and hence visible; e.g., the satellite can be detected as a dark silhouette against the Moon

☐ **Hide 'double' solar transits** (events/geographic places with passing of the satellite in front of the Sun on consecutively passes)

☐ **Mirror hemisphere images:** the satellite tracks are shown with reversed east and west directions

Tuesday 23 April 2013

Time (24-hour clock)	Object (Link)	Event
	Observer Site	**Saint cyr sur Loire, France** **WGS84: Lon: +0d39m48.10s Lat: +47d24m04.92s Alt: 135m** **All times in CET or CEST (during summer)**
21h32m30.96s	ISS	**Close to Elnath/Al Nath, Bet Tau (SAO 77168, HIP 25428 HD 35497), Magnitude=1.6mag**. Separation=0.994° Position Angle=178.4°, Position angle vertex=128.0° Angular diameter=42.6" size=109.0m x 73.0m x 27.5m Satellite at Azimuth=272.0° W Altitude= 37.2° Distance=648.9 km **Magnitude=-1.8mag** In a clock-face concept, the satellite will seem to move toward 10:44 Angular Velocity=29.2'/s **Centerline, closest point** →Map: Longitude= 0°35'02"E Latitude=+47°17'59" (WGS84) **Distance=12.77 km** Azimuth=208.0° SSW Path direction=117.8° ESE ground speed=7.979 km/s Sun elevation=-6° Elongation from Sun=49° Orbit source: NASA predicted orbit
21h33m33s	**ISS** →Ground track →Star chart	**Appears 21h28m11s 5.4mag az:293.5° WNW horizon** **Culmination 21h33m33s -3.7mag az:210.2° SSW h:59.2°** **distance: 473.6km height above Earth: 411.1km elevation of Sun: -6° angular velocity: 0.96°/s** **at Meridian 21h33m52s -3.9mag az:180.0° S h:55.3°** **Disappears 21h37m04s -1.7mag az:129.4° SE h:8.3°**
23h09m32s	**ISS** →Ground track →Star chart	**Appears 23h05m16s 1.4mag az:280.8° W horizon** **Culmination 23h09m32s -1.3mag az:227.5° SW h:10.5°** **distance: 1438.0km height above Earth: 408.4km elevation of Sun: -19° angular velocity: 0.32°/s** **Disappears 23h09m50s -1.3mag az:222.3° SW h:10.4°**

Wednesday 24 April 2013

Time (24-hour clock)	Object (Link)	Event
22h19m07s	**ISS** →Ground track →Star chart	**Appears 22h14m18s 2.7mag az:286.6° WNW horizon** **Culmination 22h19m06s -1.8mag az:222.8° SW h:17.5°** **distance: 1094.8km height above Earth: 409.4km elevation of Sun: -13° angular velocity: 0.42°/s** **Disappears 22h21m17s -1.7mag az:180.0° S h:10.5°**

Thursday 25 April 2013

Time (24-hour clock)	Object (Link)	Event
21h28m37s	**ISS** →Ground track →Star chart	**Appears 21h23m29s 5.2mag az:290.4° WNW horizon** **Culmination 21h28m37s -2.3mag az:218.0° SW h:28.0°** **distance: 796.2km height above Earth: 410.6km elevation of Sun: -5° angular velocity: 0.57°/s** **at Meridian 21h29m52s -2.5mag az:180.0° S h:21.6°** **Disappears 21h32m49s -1.2mag az:148.7° SSE h:3.7°**

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

☐ Show glossary

Top

Select start of calculation:
Date: 23 April 2013
Time: 21 : 28 : 10 Now
Select duration: 10 Minutes
Select interval: 2 Seconds go!


```
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Launched:       20 Nov 1998
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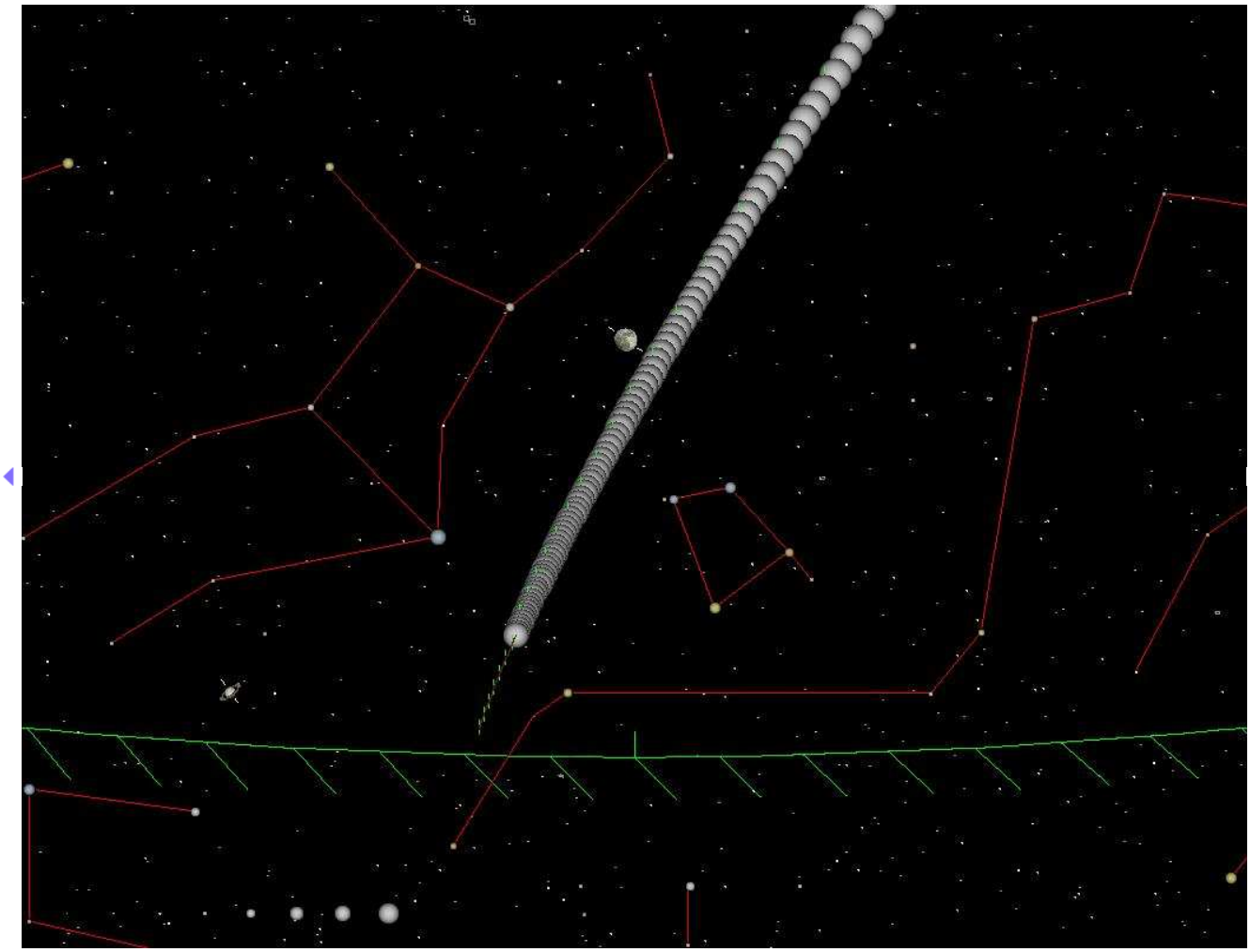
See more/less data and options by changing the user level!

Simulation
800 Output size
Grid
Main lines
Constellations
Boundaries
no line of Horizon
Negate colors
draw no symbols
Realism (e.g., show Planets/Moons)

Telescope
Vertex is up
Telrad
Left-right mirrored image
Inverted image
Digitized Sky Survey photographic plates (supports only equatorial view)
Auto Limiting Magnitude

Pointing
Whole Sky
Center Satellite
60 deg Field of View
Direction
Object Name, NGC M PGC Cr Tr B Sh2 PK Abell Mrk ACO SDSS 2QZ / SAO HIP TYC HD FK5 XZ Gl Struve
12:35:43.624 Right Ascension
-14:05:45.514 Declination
go!



Stars as seen from the observer.
Visual limiting magnitude: 7.5 mag

Time:

Tuesday, 23 April 2013, 21h 28m 10s
JD: **2456406.3112269** TDT: 2456406.3120030 deltaT: 67.06 sec
Apparent sidereal time: Local: 9h 38m 49.734s Greenwich: 9h 36m 10.528s
(Times in **CEST, UTC+02:00**, topocentric data for **Saint cyr sur Loire, France**)

Map Center:

Azimuth direction: 134.88° SE (Southeast)
Altitude: 16.82°
Right Ascension: 12h 36m 27.262s Apparent coordinates
Declination: - 14° 10' 21.27" Apparent coordinates

Right Ascension: 12h 35m 43.624s J2000
Declination: - 14° 05' 45.51" J2000

Elongation from Sun center: 158.13°
Elongation from Moon center: 8.32°

Rises: 19h 26m (Azimuth: 110.5° ESE)
Transit: 0h 25m 18s on following day(Altitude: +28.46°)
Sets: 5h 24m on following day (Azimuth: 249.5° WSW)
Time above horizon: 9h 58m

Opposition in R.A.: 30. March 2013 12h 22m CET Elongation: 169.8°
Conjunction in R.A.: 3. October 2013 1h 08m CEST Elongation: 10.2°

Sun:

Altitude: -5.6°
Azimuth: 295.7°

Moon:

Altitude: 25.1°
Azimuth: 134.3°
Phase, illum. fraction: 94.6% (geocentric)

Print E-mail

Positions are shown in **topocentric (for objects within the solar system, geocentric otherwise) astrometric (airfree) equatorial coordinates at equinox J2000.0 (Right Ascension/Declination) and epoch of date given**. Stereoscopic projection is used for the star chart. If you zoom into a field of view in order of minutes of arc, you will get a fantastic photographic background image from the Digitized Sky Survey (DSS) from the Mount Palomar observatory.

Pointing the mouse to targets reveals their names - the higher the selected user level, the more features are labeled. The highest level "Astronomer" displays all object names. You can switch the user level just next to the small Earth icon on top of each page.

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Create new default account/Logout

Software Version: 23 April 2013
Database updated 10 min ago
Current Users: 162, Runtime: 2.4s

24 Apr 2013, 8:12 UTC
587 minutes left for this session / Mode for our sponsors