

# SunEarthTools.com

Tools for consumers and designers of solar

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**Sun Position** Photovoltaic payback Photovoltaic FAQ SunRise SunSet Calendar

19:41 | Thursday 14 February 2013



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select your points

search

34.393751, -118.585747 34° 23' 37.504" N 118° 35' 8.689" W

SunRise: 06:40:11 \* 105.02° | SunSet: 17:37:16 \* 255.17° |

26039 Sandburg Place, Stevenson Ranch, CA 91381, USA

Name

execute

Solar Disk  Analemma  Solstice

[See Todays Mortgage Rates](#)

[www.MortgageRates.LowerMyBills.com](http://www.MortgageRates.LowerMyBills.com)

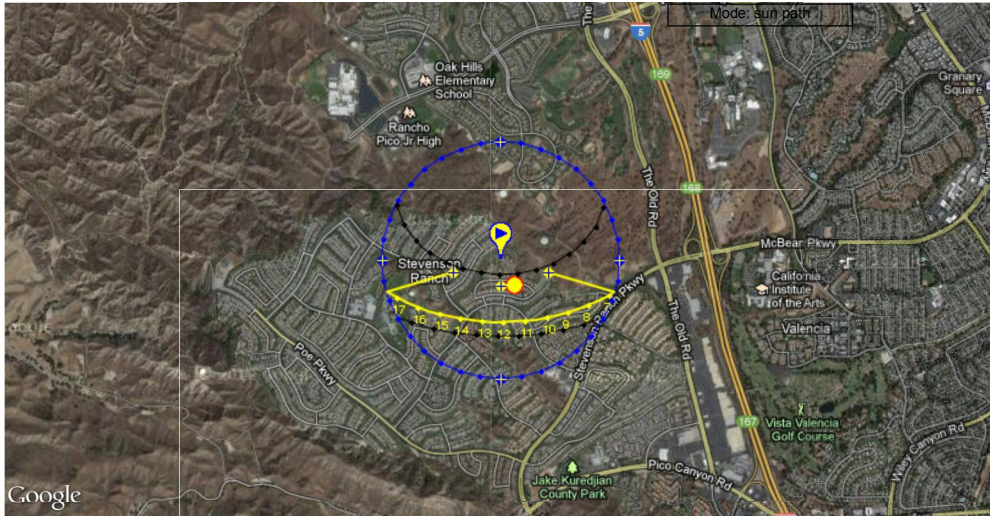
Rates Hit New Lows at 2.5%(2.9%APR) FHA Cuts Mortgage Requireme



year month day hour minute

2013 02 14 10 41

Time zone GMT-8 DST  (Default)



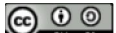
**LEGENDARY RELIABILITY.**

Get **0.0%** APR for 60 months\* on a New 2013 Corolla



\*See Details

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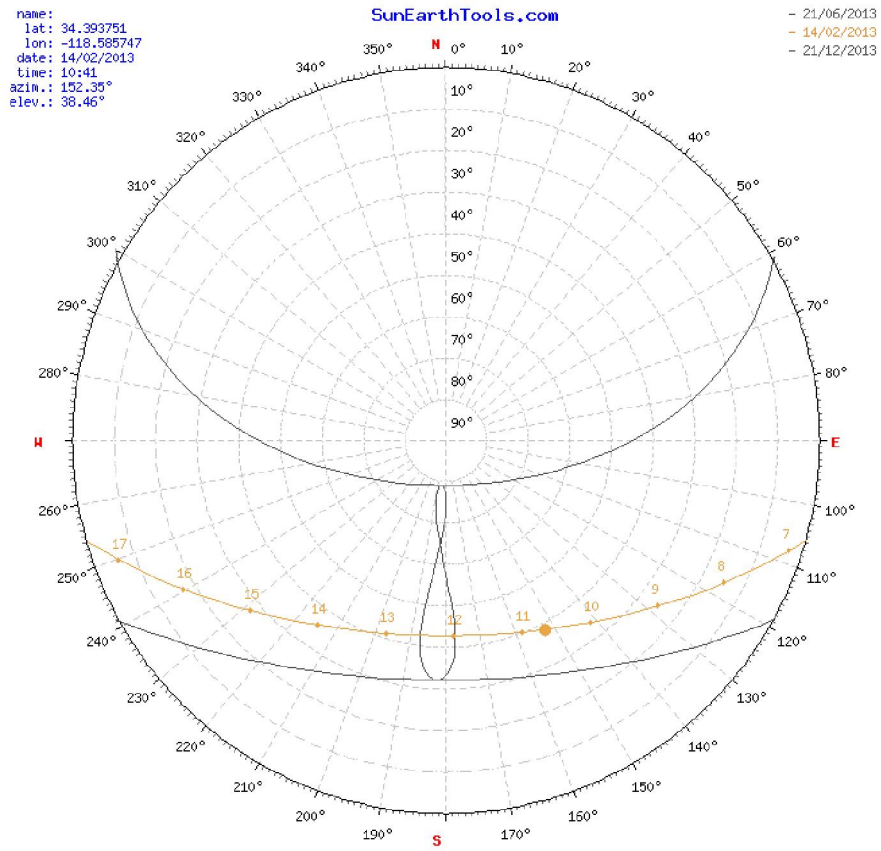
[Data + Map](#)

[Chart Polar](#)

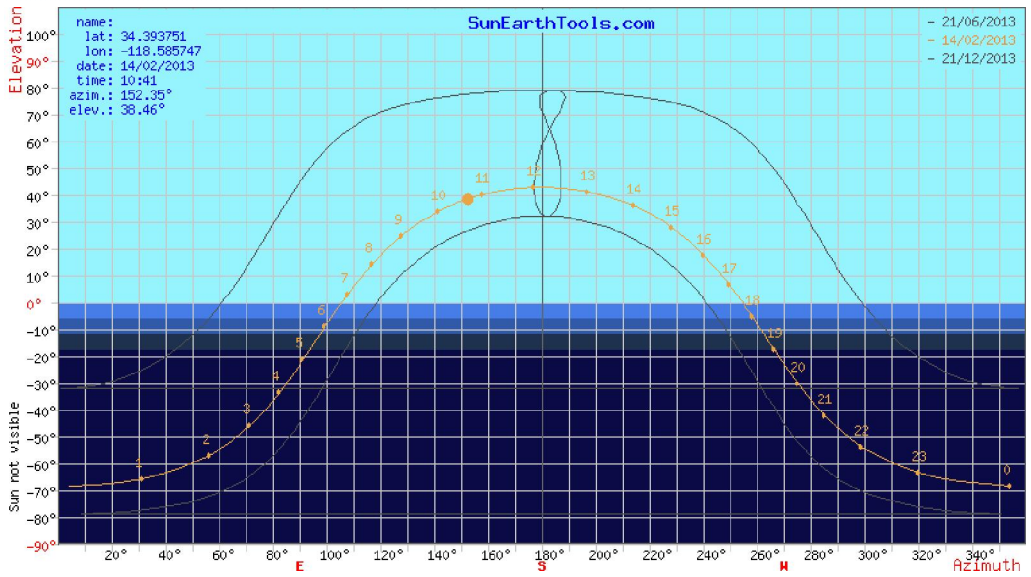
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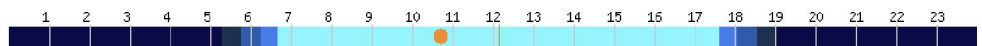
Visits:  
on Line:  
p:1




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sun position	Elevation	Azimuth	latitude	longitude
14/02/2013 10:41	38.46°	152.35°	34.393751° N	118.585747° W
twilight	Sunrise	Sunset	Azimuth Sunrise	Azimuth Sunset
twilight -0.833°	06:40:11	17:37:16	105.02°	255.17°
Civil twilight -6°	06:14:27	18:02:58	101.46°	258.74°

Nautical twilight -12°	05:44:58	18:32:27	97.45°	262.76°
Astronomical twilight -18°	05:15:46	19:01:41	93.49°	266.75°
daylight 	hh:mm:ss	diff. dd+1	diff. dd-1	Noon
14/02/2013	10:57:05	00:02:00	-00:01:58	12:08:43

Step (minute):    [download Excel table](#)

Date:	14/02/2013	
coordinates:	34.393751, -118.585747	
location:	725 7th Avenue, New York, NY 10019, USA	
hour	Elevation	Azimuth
06:40:11	-0.833°	105.02°
7:00:00	3.09°	107.83°
8:00:00	14.53°	117.06°
9:00:00	24.99°	127.96°
10:00:00	33.82°	141.37°
11:00:00	40.11°	157.94°
12:00:00	42.81°	177.17°
13:00:00	41.31°	196.82°
14:00:00	35.95°	214.29°
15:00:00	27.75°	228.59°
16:00:00	17.7°	240.14°
17:00:00	6.49°	249.78°
17:37:16	-0.833°	255.17°

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## Sun Position

Calculation of the position of the sun's position in the sky at one point on the earth at a particular time of day. The calculated data are: solar angle of zenith and declination angle, the time of rise set and noon, the daylight with the difference from the previous and later day. It also displays graphs of the solar path.

**Sunrise and sunset** are defined as the instant when the upper limb of the Sun's disk is just touching the horizon, this corresponds to an altitude of -0.833° degrees for the Sun.

**Twilight** is the time after sunset characterized by a diffuse light (by extension the morning twilight, use term aurora, dawn or sunrise).

**Civil twilight** lapse of time between sunset and when the sun reaches the elevation height of -6°, in the sky are visible only a few stars and planets particularly bright.

**Nautical twilight** represents the time the Sun takes a pass from -6° to -12° below the horizon, in this period are distinguished horizon line and the main stars.

**Astronomical twilight** is the time interval between sunset and when the sun reaches 18° below the horizon, the sky is dark, is possible to distinguish the stars up to the sixth magnitude.

**Noon** in solar time occurs when the sun is at its highest point in the sky for the day, and it is either due south or due north of the observer depending on the latitude.

**Azimuth** indicates an angle between a point and a reference plane. Generally is the angular distance of a point from the North.

**The height, or Elevation**, is the angular distance of the horizon a point on the celestial sphere, measured as positive if facing the Zenith, and negative if directed towards the Nadir.

**Zenith**, is the intersection perpendicular to the plane of the horizon passing through the observer with the visible celestial hemisphere and is the point above the head of the observer. The diametrically opposite point is called Nadir.

The knowledge of the position of the sun and the daylight hours, allow to know the **energy** radiated from the Sun (renewable) at the point on the Earth that we are examining.

**The solar energy** can be **heat engines** produced from solar panels or **electrical** produced by photovoltaic panels.

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## Sun chart

Sun path charts can be plotted either in Cartesian (rectangular) or Polar coordinates.

**Cartesian coordinates** where the solar elevation is plotted on X axis and the azimuth is plotted on the Y axis.

**Polar coordinates** are based on a circle where the solar elevation is read on the various concentric circles, from 0° to 90° degrees, the azimuth is the angle going around the circle from 0° to 360° degrees, the horizon is represented by the outermost circle, at the periphery.

The azimuth angle indicates the direction of the sun in the horizontal plain from a given location. North is defined to have an azimuth of 0° and south has an azimuth of 180°.

The various trajectories of the sun's in the sky are bounded by those of the 21st day (solstice) of each month from December 21 until June 21.

We plot the time, on the hour, for all hours during which the sun is in the chart.

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## Daylight

The length of day is the time interval between sunrise and sunset, so the time period in which we can observe the direct sunlight. The duration depends on the latitude, the longitude, altitude above sea level (more high and more great the length of day) and obstacles horizon. The algorithm uses the altitude 0 meters. The transition from day to night is not clear before and after there is a period of scattered light (twilight), where you can still see, the phenomenon is due to reflection (down) of light by the atmosphere that it's over to our point of observation.

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## How to use the tool map

### Search

allows you search for the following:

# **Address** (example: Central Park West, New York), (example: Macquarie St, Circular Quay NSW 2000, Australia)

# **Geographic features** (example: torre di pisa) (example: louvre)

# **Places - Cities, towns, states, provinces, states and continents** (example: Berlin, Germany)

# **Coordinates** (example: 41.38716 , 2.17010), (example: -34° 36' 43.56" -58° 24' 3.6" ), (example: 41° 53' 24.72" N 12° 29' 32.64" E)

### Map pan control

# Press the up arrow on your keyboard to move north  
 # Press the down arrow on your keyboard to move south  
 # Press the right arrow on your keyboard to move east  
 # Press the left arrow on your keyboard to move west

### Map zoom control

# Zoom: Click + to zoom in on the center of the map, click - to zoom out.  
 # Zoom slider - Drag the zoom slider up or down to zoom in or out incrementally

### Coordinates

This text visualize the coordinates referring to the marker on the map.

### Address

This text visualize the address of the marker on the map.

### MAP

This area displays the map, search results and much more.

### Left click

Set a marker on the map and update the values in the text fields coordinates and address.

### Double click

Zoom in on the center of the map.

### Right click

open a context menu

# **saveAsDefault**

# **Zoom In Here**

# **Zoom Out Here**

# **Clear Markers**

# **Mode:** Point - Distance - Polyline - Area. see help [Use Mode](#)

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## Use Mode

Before selecting the mode of use, select a point in the map, right-click button in the menu and choose in the menu: saveAsDefault, this way you save the reference default.

To find in the map, the coordinates (latitude, longitude), read the guide [How to use the tool map](#).

### Point

by left clicking on the map appears a marker that contain the latitude, longitude and street address information, each click creates a new marker.

### Distance

by left clicking on the map appears a marker and a line from the default marker to new marker, the next click remove the old marker and creates a new. On the top text field you can visualize the distance value between the two points, measured in Km, mile (mi) or for short distance meters (mt), foot (ft).

### Polyline

by left clicking on the map appears a marker and a segment from the previous marker to new marker, all marker are linked with segment from the default. On the top text field you can visualize the distance value from default to the last point, measured in Km, mile (mi) or for short distance meters (mt), foot (ft). This is very useful to calculate the distance of a path of trekking, mountain bike, sport, free time ...

### Area

Measure the area enclosed in the polyline, the perimeter of the area and highlighted the direction of the last segment.

### Rays of the Sun

View the map the height and direction of sunlight.

### Shadow

View on map the length (normalized, change with the zoom map) and the direction of the shadow produced by an obstacle, the formula is: shadow object length = object height / tan(sun elevation degree).

#### Units of measurement

km - kilometers, mt - meters, mi - miles, ft - foot, nmi - nautical miles.

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### Equation of time

A Simple Expression for the Equation of Time:  
n = day of the year.

$$\Delta t = 9.873 \sin(4\pi / 365.242 (n - 81)) - 7.655 \sin(2\pi / 365.242 (n - 1))$$

|  $\Delta t = -15:24$  [ minute : seconds ] | Date : 14 / 02 / 2013 | [Change data](#)

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### shadow

The length of the shadow map is normalized (changing with the zoom), and the direction is opposite azimuth.  
The measurement of the length of the shadow depends on the height of the obstacle and the elevation of the sun, the formula is:  
length shadow = object height / tan ( sun elevation ).

shadow length	Height	Elevation°
Infinity	10	0°
shadow°	Azimuth°	
180.00°	0°	

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### Date

#### Year Month Day

Are the date, the values are selectably by combo, the default is today.

#### Hour : Minute

Are the time, the values are selectably by combo, the default is now.

#### Time zone GMT

Greenwich Mean Time, identifies the time zone of reference of the Earth. If we divide the 360° for 24 to obtain a 24 parts every 15° longitude, in reality the area is bounded by national borders.

#### DST

Daylight saving time, clocks are adjusted forward one hour near the start of spring and are adjusted backward in autumn.

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### Format

#### Value range

Valid value for the latitude are from -90.0° to 90.0° for the longitude are from -180.0° to 180.0°, the + sign should be omitted, while the minus sign is not necessary if there is a radio component to select the direction N-S or W-E (Degree and Decimal format).

#### Decimal

You have to select a direction (N-S or W-E) and insert a number from 0 to 90 for the latitude or from 0 to 180 for the longitude (example 45.12345).

#### Degree


Degree format is composed of direction (N-S or W-E) and three sets of numbers separate by the symbols for degrees (°), minutes ('), and seconds ("). Degree is an integer value without sign, from 0 to 90 for the latitude or from 0 to 180 for the longitude. Minute is an integer value without sign, from 0 to 59. Seconds is a double value without sign, from 0 (or 0.0000) to 59.9999.

#### Coordinates

Coordinates format is the pair of latitude and longitude, with sign minus (-) for the direction south latitude and west longitude separate by comma symbol (,), here some example:

52.5163 , 13.3779  
40.7682 , -73.9816  
-22.9708 , -43.1830

#### Search on map

Click on search  to open the webpage Earth Coordinate, here you obtain the latitude and longitude simply by clicking on the map, and save the value by the button save.

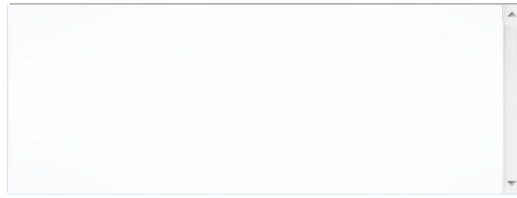
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### Comment

If detected inaccuracies bug, want to suggest new features or simply express your opinion of the site web add a comment.  
Thanks in advance for your contribution to improve this site (please correct the errors of grammar and translation).

Email (optional)

Comment (required) (use English or Italian)



Validation code (required)

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Reported by:    Visita IP: 10.21.212.30, 170.170.59.139  
Visitas hov: 1579

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