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Stellarium

Stellarium is a free software to simulate a planetarium on your own computer. This article intends to give a short overview on the basic function and possibilities using Stellarium.

Install Stellarium

You can download the software on the official [website](#). There are multiple versions for Windows (32/64Bit), Mac OS and Linux.

For Linux one gets the source code which has to be compiled. For Debian and their derivatives such as Ubuntu, Stellarium can easily be installed from the standard package repository:

```
sudo apt-get install stellarium
```

Working with Stellarium


Stellarium is capable of simulating the apparent sky at given time on any position on the earth. We will now go through the basic menus that control what you can see.





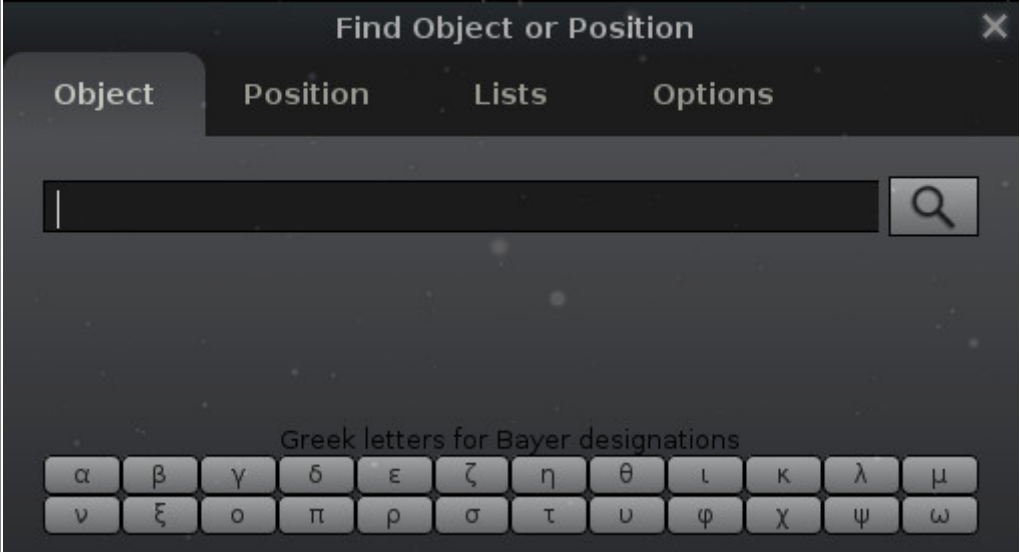



The menus

Stellarium has three different menu bars. Two in the lower left which appear only if the mouse is close. The third one is in the upper right corner and is always visible.






Main menu


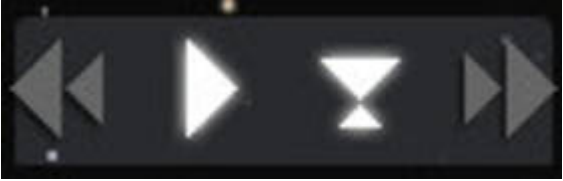
All basic functions can be found here as well as useful and necessary configurations. This is the vertical menu on the left.

Button	Hotkey	Description
	[F6]	Choose your place on earth. Stellarium has a large list of known locations gathered by the community. There you find the <i>Astrophysical Institute Potsdam</i> which is the AIP in Potsdam Babelsberg. This is sufficiently close enough to Golm to plan lab course observations. Alternatively one can enter coordinates directly. One needs longitude, latitude, and elevation above ground level . A more rough method is to simply click into the shown map to retrieve coordinates.


Button	Hotkey	Description
	[F5]	Configure the clock. 
	[F4]	Here you can choose which objects are displayed.
	[F3]	Opens the search window. Stellarium has an extensive database of over 100K stars, various nebulae, clusters, satellites and the like. This can be extended by plug-ins. If there is an internet connection, Stellarium matches the search term with the database of Simbad and obtains the coordinates. This allows Stellarium to find an object with different designations. 
	[F2]	Opens the options menu
	[F1]	Opens the help window
	[STRG]+[Q]	Exits Stellarium

The observer menu

Buttons group	Designation	Hotkey	Function
	Turns the display of constellations on and off. The options can be combined as desired.	[C]	Connecting lines between stars of the constellations are displayed.
		[V]	The name is displayed.
		[R]	Artistic impressions matching the constellations are displayed.
	Displays coordinate systems.	[E]	An azimuthal coordinate system (orange) in which the coordinates of an object depend on the choice of location.
		[Z]	The equatorial coordinate system (blue) with the axes right ascension and declination.
	Controls the view in Stellarium	[STRG]+[M]	Viewing angle can be switched between azimuthal and horizontal mount.
		[LEER]	Centers the view on an object as long as it is selected.
		None	Switches to night vision mode. Red light does not dazzle and destroys the eyes habituation to the dark less.
		[F11]	Switches between window and full screen mode.
	Responsible for eyepiece view and finding satellites.	[STRG]+[O]	Switches to the eyepiece view and gives an impression of the field of view with different equipment, more about this under telescope menu.
		[STRG]+[Z]	Displays artificial satellites, selected ones also with predicted trajectory.
	Displays markers for additional objects.	[D]	Deep sky objects, including galaxies, nebulae, and star clusters.
		[P]	Solar system objects, planets and their moons

Buttons group	Designation	Hotkey	Function
	Switching on and off the influence of the earth	[G]	Toggles the display of the ground level. Useful to see how high an object is above the horizon. The ground display can be adjusted in the options menu to simulate high buildings or mountains in the vicinity.
		[Q]	Display of cardinal directions for easier orientation
		[A]	Switching the atmosphere. The artificial earth atmosphere simulates scattered light, refractive position changes, and extinction.
	Control of the time flow. At startup Stellarium inherits the system time and lets the time run along. With the control the speed and direction of the time can be specified or completely stopped.	[J]	Fast rewind, each additional click increases speed
		[K]	Pause the simulation, at increased speed it will be reset to normal.
		[8]	Resets the clock to system time. The increased speed is preserved.
		[L]	Fast forward, each additional click increases the speed

Das Teleskopmenue

Schaltflaechengruppe	Bezeichnung	Funktion
	Das Teleskopmenue bietet die Moeglichkeit Gesichtsfelder der eigenen Ausruistung zu simulieren. Die Verwendung dieser Option wird separat beschrieben	Schaltet die Okularansicht ein. Es erscheint eine weitere Schaltflaeche, die ein Fadenkreuz einblendet
		Zeigt die Groesse des Bildsensors an.
		Oeffnet die Konfiguration des Teleskop Plugins

What does Stellarium offer me?

Stellarium offers a considerable amount of additional information in addition to the simulation.

Level of detail and additional information

Stellarium outputs a list of parameters for each object. Most of these are coordinates in various coordinate systems. In addition, depending on the object, there is also basic information. For stars

these are for example spectral type and photometric data. These are to be handled with care. Often these data differ from the current state of knowledge. Therefore, for each object at least the [Simbad database](#) should always be consulted.

Day and night cycle, scattered light

Stellarium simulates besides the positions of the objects also a luminosity cycle in the sky. This is based on a rough approximation including the positions of all luminous objects. First and foremost, the sun naturally provides the most scattered light. But also darker objects like the moon, Jupiter or Saturn can illuminate the sky around them so much that darker objects are no longer visible. However, the representation of Stellarium is only a rough guide, for observations at the OST the light scattering is greater due to the air pollution of the surrounding cities.

Incorporation of own observation equipment

There is the possibility to simulate the specifications of own observation equipment. For this a special PlugIn is needed, which is however already present in the standard installation. If it is activated, a new menu appears in the right, upper corner. There you can enter the parameters. Required are telescope aperture, focal length of the telescope, focal length of the eyepieces and the dimension of the camera chips. From this Stellarium calculates the field of view of any combination of the entered equipment. This can be helpful if, for example, a nebula is to be imaged. You can check in advance if the selected object is too big or too small for a certain configuration.

Extensions

There are a lot of extensions for Stellarium, too many to mention here. For working with the OST the standard installation is usually sufficient. Also installing additional catalogs makes only limited sense, because of the connection to the Simbad database. All known objects, which were listed somewhere once, can be found by their coordinates. Even if these objects are not always displayed.

Wie verwende ich Stellarium?

Eine Beobachtung planen

Zur Vorbereitung einer jeden Beobachtung gehoert das Zusammenstellen einer Objektliste. In erster Linie haengt die Objektauswahl natuerlich von der Natur der gewuenschten Beobachtung selbst ab. Ist man sich im Klaren welche Art von Objekten man beobachten will, kann mit Stellarium ueberprueft werden, welche Objekte fuer eine Observation in Frage kommen. Die Erstellung einer Objektliste mann grob den folgenden Schritten folgen.

1. Was will ich beobachten? Sterne, Galaxien, Nebel?
2. Was ist am Tag, b.z.w. in der Nacht der Beobachtung ueberhaupt sichtbar? Dazu kann der Zeitpunkt in Stellarium auf die gewuenschte Nacht eingestellt werden. Der genaue Zeitpunkt, der gewaehlt werden sollte, ist abhaengig von der Jahreszeit und von der Beobachtungsplanung. Im Sommer geht die Sonne erst spaet unter, der Start einer

Beobachtung verschiebt sich damit nach hinten. Im Winter kann bereits deutlich frueher angefangen werden. Es sind dann sogar zwei verschiedene Beobachtungen moeglich, die Zweite sollte dann mit einer spaeteren Zeit geplant werden. Auch die Bewegung eines Objektes muss mit einbezogen werden, wenn fuer die Beobachtung viele Aufnahmen oder eine lange Belichtungszeit notwendig sind. Das OST folgt zwar der Bewegung, ist aber machtlos, wenn ein Objekt waehrend der Beobachtung untergeht oder hinter Gebaeuden verschwindet.

3. Wie hell ist das Objekt? Stellarium ist in der Lage die Helligkeit eines Objektes mit Einfluss der Erdatmosphaere abzuschuetzen.
4. Wie gross ist das Objekt? Bei Nebeln oder Galaxien kann es passieren, dass das Sichtfeld des Teleskops zu klein ist. Dazu bietet Stellarium eine Vergleichsmoeglichkeit mit der vorhandenen Teleskopausstattung. Mehr zu dem Thema [hier](#).
5. Was befindet sich in der naeheren Umgebung? Sind hellere Objekte vorhanden, die meine Beobachtung beeinflussen koennen? Groesster Stoerfaktor ist hier der Mond, aber auch Jupiter und Saturn koennen durch ihre grosse Helligkeit den Himmel um sich herum so stark aufhellen, dass dunklere Objekte ueberstrahlt werden. Selbst die hellsten Sterne sind nahe am Vollmond praktisch nicht mehr zu erkennen. Stellarium zeigt die Phase und den Grad der Beleuchtung an. Auch die grafische Darstellung von Monden und Planeten ist dynamisch, das heisst, die beleuchtete Flaechen in Stellarium entspricht der am Himmel.
6. Gibt es weitere Detailanforderungen? Planeten und Monde des Sonnensystems haben eine besondere Genauigkeit in Stellarium. So verschwinden beispielsweise Monde hinter Jupiter oder werfen einen Schatten auf ihn, wenn sie an ihm vorueber ziehen. Auch die Rotation von der Planeten selbst ist mit einbezogen und so kann festgestellt werden, ob zum Beispiel der grosse rote Fleck sichtbar ist.

Alternativen

Stellarium bietet mit seinen vielen Moeglichkeiten bereits viele Informationen. Vergleichbar leistungsstarke Software ist meist nicht frei nutzbar. Eine Auswahl befindet sich [hier](#).

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