https://moon-planner.koschny.eu – Short User Manual for the web interface to the 'moon planner' tool

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1. Overview

The url https://moon-planner.koschny.eu links to a web page which lets you plot the Moon's altitude/elevation and speed for a given site over a specified date range. It provides visualizations of the Moon's conditions as seen from a specific location.

It uses the stand-alone script 'moon-planner.py', which is available as a stand-alone command line tool from the author.

NOTE: The current on-line version does not yet support custom horizon files.

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2. Purpose and Functionality

- Plots the **Moon's altitude/elevation** and **movement speeds** over a given period.
- Supports input for:
  - **Preset location** (default: Koschny Observatory, code: B12)
  - **Custom coordinates** (latitude, longitude, and height)
- Produces **PNG plots** that can be visualized with an external program. The online version shows the plots in the browser and allows downloading them.

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3. Usage

The minimum input required is the 'observatory code or coordinates' and the 'start date'. Enter the required values and press 'generate plot' to compute the result.

'Observatory code or coordinates': Required. You can either use the IAU observatory code (B12 = Koschny Observatory; K67 = Bayerwald-Sternwarte; …) or coordinates. When using custom coordinates, you must enter latitude (East positive), longitude, height, in this order. Use decimal degrees, Put parentheses around the numbers, e.g. "4.4906, 52.07899, 0" would be the coordinates for B12.

'Start date': Required. The start date for the computation. I use the European format of dd/mm/yyyy. Type it into the field, or select from the displayed calendar. Defaults to today.

'End date': Optional. When adding an 'end date', several plots will be generated, one for each night. The plots will be shown in local time.

The second line allows you to enter optional parameters.

'Time zone override': The resulting plots default to your local time, which is automatically determined from your coordinates. This might not always work, or you might want to force a different time zone, e.g. UTC. The filed 'time zone override' accepts any valid IANA time-zone name. Do not use CET, CEST, ET, MST, PST, as these are ambiguous or daylight-saving dependent. Just pick a place closest to you. Note that in the output plots, I write the short time zone name.

'Horizon CSV': This allows you to enter a file name for a description of your local horizon. To use that, prepare a comma-separated file with azimuth and elevation (North = 0 deg, East = 90 deg, South = 180 deg). Send it with the name 'horizon_xxx.csv' to the author, where 'xxx' is your IAU observatory code. If you don't have one, use the full name of your observatory. I will include it on the server.

'Cadence': The time interval for the computation. The smallest value is 1 min. If you have performance issues, use a larger value. Default is 3 min. Note that this also means that the accuracy of all events is only 3 min. I would typically get an overview over the complete month using 3 min; then, for detailed nights of interest, redo the plot with 1 min.

'Min elev': The minimum elevation displayed in the lower two plots. Default is 0 deg.

'Max elev': The maximum elevation displayed in the lower two plots. Defaults to 90 deg. For higher latitudes, this can be reduced. E.g. in the Netherlands the Moon normally doesn't get above 70 deg anyway.

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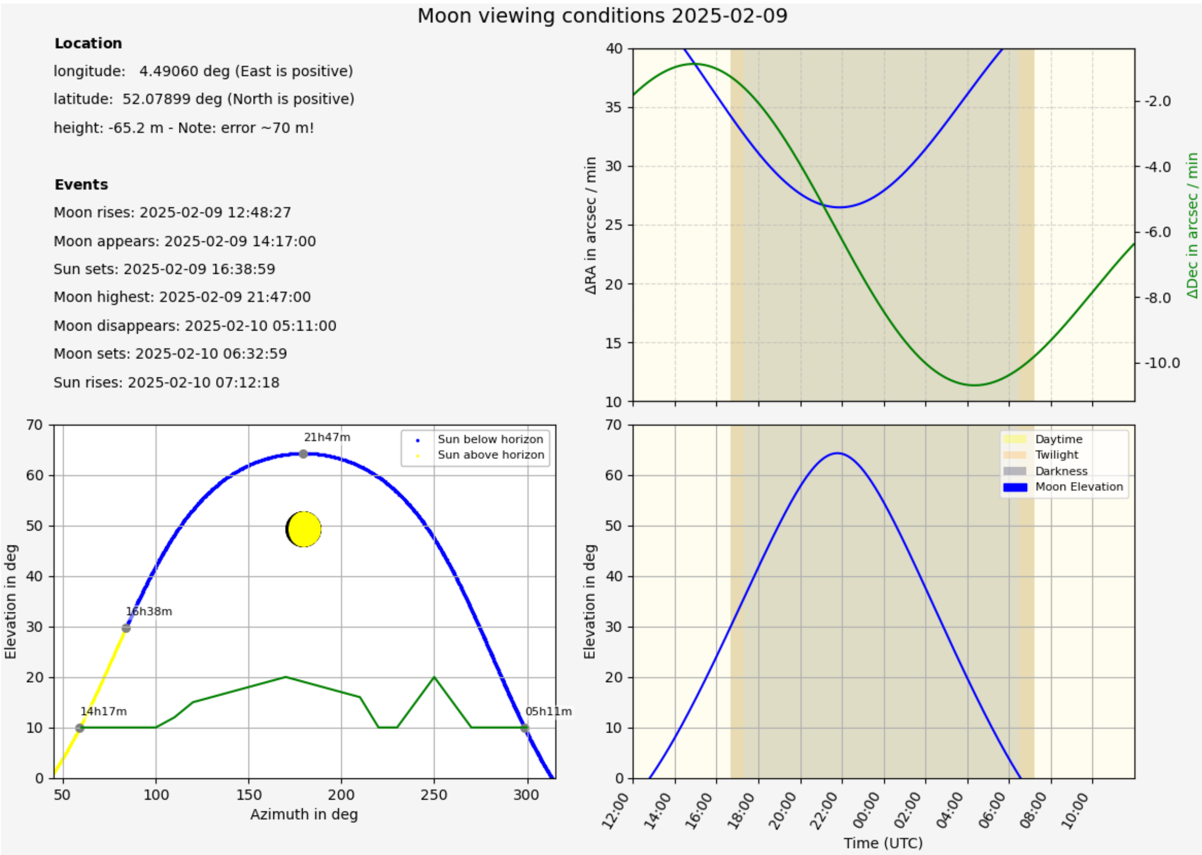
4. Explaining the output:
The following plot shows an example of an output file.



There are four panels.

- The upper left panel gives information on the location. Check whether this is correct, don't mix up latitude and longitude! The 'events' are sorted by time. If an event does not

occur (e.g. if the Moon never comes above the defined custom horizon), it will not be shown.
NOTE: The computation for rise and set times of Sun and Moon assumes a fixed correction for the refraction. Typical weather apps take the top of the object rather than the center into account. We here correct the centre time by fixed values of -0.833 deg for the Sun, -0.5667 deg for the Moon). Thus, expect up to a few minutes of deviation with respect to other computations.

- The lower left panel is the most important one. It shows the elevation of the Moon as a function of azimuth. The custom horizon is shown as a green line. The path of the Moon is yellow when the Sun is above the horizon, blue for the Sun below the horizon. Key times are marked.

- The upper right panel shows the apparent speeds of the Moon in right ascension (RA) and declination (Dec) in arcseconds per minute. Due to its movement around the Sun, the Moon always moves in the positive direction in RA. The movement in Dec is a result of the fact that the observer normally does not sit in the Earth's centre, but on the rotating surface of the Earth (= parallax). This is useful to understand why your tracking might not be perfect.

- The lower right panel shows the elevation of the Moon as a function of time. Both right panels show daytime as light yellow, night as grey. The intermediate area denotes twilight.

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5. Support and Feedback

For questions, support, or feedback, please contact the developer at:

- **Email:** detlef 'dot' koschny 'at' tum 'dot' de.