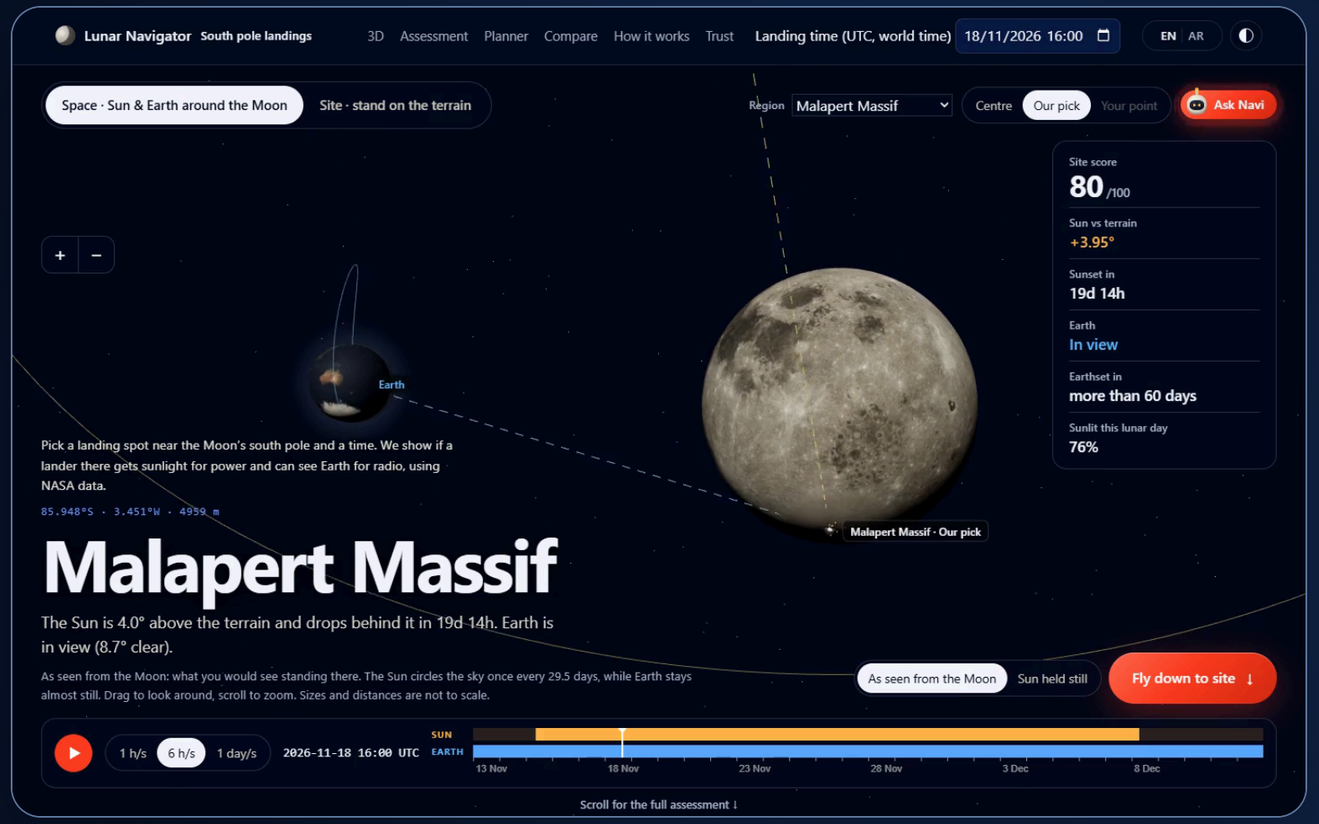
Lunar Navigator

Choose a landing site with the Sun and Earth in sight.

A working south-pole explorer that turns NASA terrain and sky data into a site, date and surface-stay plan anyone can inspect.

- Interactive website · English + Arabic

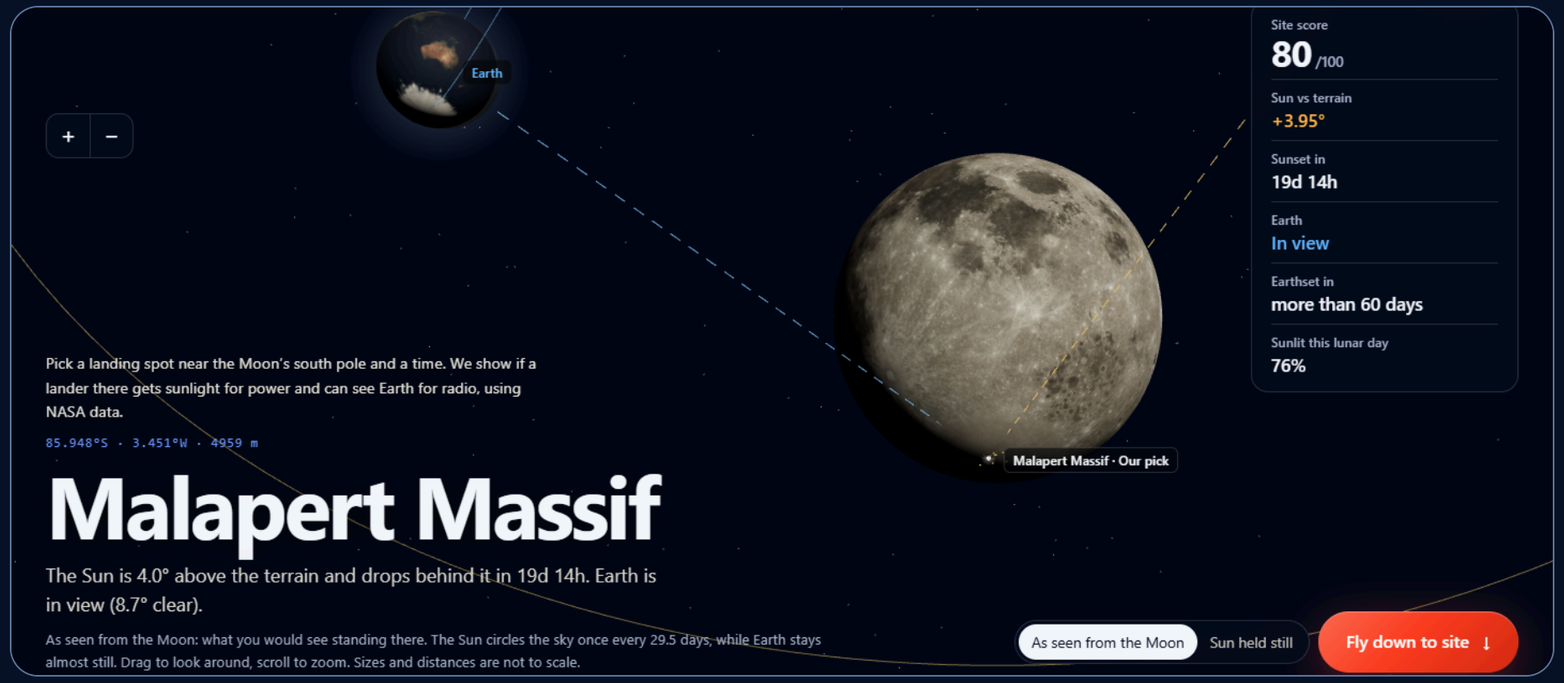
9	80,353	6,207
NASA CANDIDATE REGIONS	HOURLY SKY ROWS	CRATER DAILY RECORDS



Live app · Malapert Massif · Our pick
18 Nov 2026, 16:00 UTC: Sun +3.95° above terrain; Earth in view.

Start with the Moon. Get an answer.

At the pole, a ridge can hide the low Sun or Earth. Choose a NASA region, a point and a time; the homepage shows the scene and the site's current power and contact outlook.



Live homepage. Orbit the Moon, compare Sun and Earth, then fly down to the chosen site.



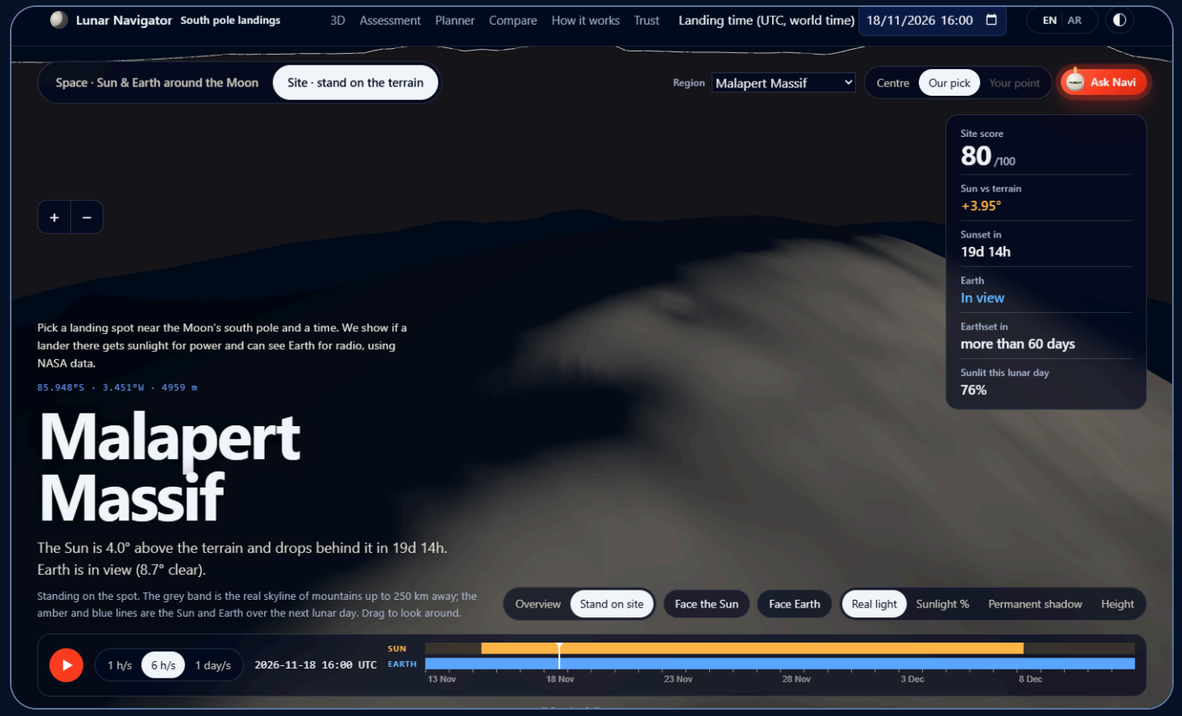


Ask Navi. Get plain-language answers about sunrise, Earth view, windows or battery for the chosen site.

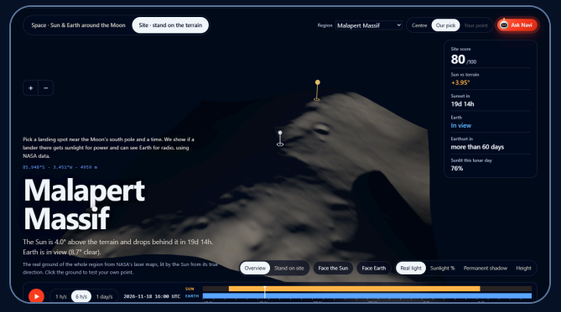
Read the next month at a glance. Orange = Sun above terrain; blue = Earth in direct view. Dark gaps mean hidden. The white marker is the chosen UTC hour; drag it or press play to see what changes.

A map becomes the astronaut's view.

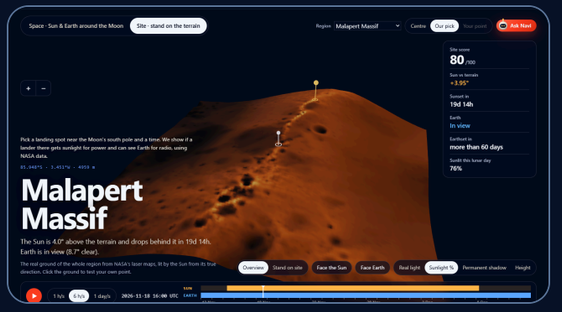
Switch from the region overview to ground level, face the Sun or Earth, and move through time against the local skyline.



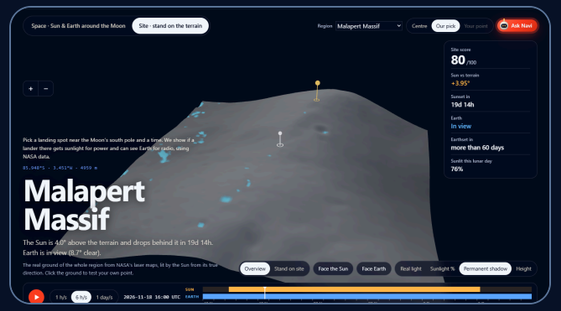
Stand on site. The modeled skyline shows whether distant ridges obstruct the Sun or Earth.



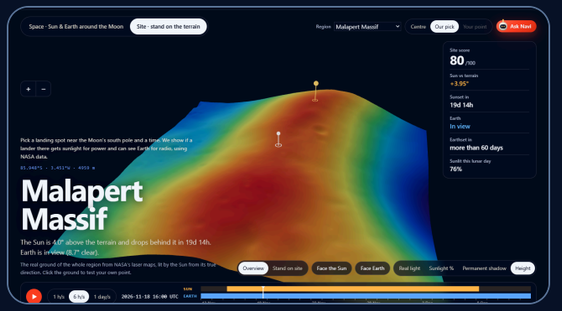
Real light
See the Sun's lighting on relief.



Sunlight %
Compare long-term solar visibility.



Permanent shadow
Spot possible cold traps.



Height
Find ridges and elevation changes.

Real NASA terrain. The local horizon uses 720 rays out to 250 km.

One chosen point. The scene, assessment and planner update together.

A better spot changes the mission picture.

Mons Mouton Plateau · hours with Sun and Earth visible together, modeled November 2026–December 2035.

Region centre

19.2%

The centre is a map reference, not necessarily the strongest landing point.

Best screened spot +49.5 points

68.7%

Best of 40 refined candidates after NASA slope and visibility screening; ranked by simultaneous Sun and Earth hours.

We also modeled landing scatter.
49 points within 100 m of each target reveal whether a small miss changes the result.

Mons Mouton Plateau · best spot
44.7–70.4%
Sun + Earth, 100 m radius

Peak near Cabeus B · best spot
2.3–59.2%
Much more sensitive to position

From Compare regions · 3 of 9 regions "Both" is the share of hours with Sun above terrain and Earth in direct view; night is the longest continuous darkness.

REGION	SPOT	SUN	EARTH	BOTH	LONGEST NIGHT
Peak near Cabeus B	Our pick	65.7%	87.3%	57.6%	12.5 d
Malapert Massif	Our pick	67.4%	100%	67.4%	11.9 d
Mons Mouton Plateau	**Our pick**	**68.7%**	**100%**	**68.7%**	**11.8 d**

Would a late landing still work?

Malapert Massif · selected spot · six-day stay · 30 November 2026, 16:00 UTC · default visibility thresholds.

ON TIME · 30 NOV

100%

SUN + EARTH DURING STAY

→

+7 DAYS · 7 DEC

10%

SUN + EARTH DURING STAY

Both look clear at touchdown.

Sun and Earth are in view at both arrival instants. Seven days late, sunset is only 14 hours away: the six-day stay contains a 5.4-day dark spell.

Next window

15 Dec 2026
21:00 UTC

Planner verdict

Misses this Sun/Earth window; wait or revise the plan.

Checks sunlight and direct-Earth visibility, not descent safety. Test +1 hour to +1 month and estimate battery energy from the dark interval.



	On time	Late by 7.0 days
Landing time	30 Nov 2026, 16:00 UTC	7 Dec 2026, 16:00 UTC
Sun at touchdown	Sunlit (100% of the disc)	Sunlit (100% of the disc)
Earth at touchdown	In view	In view
Next Sun change	Sunset in 7d 14h	Sunset in 14 h 18 min
Sunlit during the stay	100%	10% −90
Earth in view during the stay	100%	100%
Both during the stay	100%	10% −90
Longest dark spell in the stay	0.0 d	5.4 d

Calendar · 2026–2035

Color each day by hours with Sun and Earth together.

Choose the stay

Search windows for your own surface duration.

Power survival

Turn longest darkness into battery energy at your wattage.

Eclipse flags

See when a lunar eclipse interrupts the Sun.

How well do our calculations match?

We checked against 58 separate JPL Horizons runs, NASA’s LOLA maps at 200 points, NASA’s eclipse catalog and NASA’s Lunar Surface Data Book.

9 regions
NASA’s Artemis candidate regions, October 2024 list

5 m terrain
LOLA site tiles, blended with wider elevation grids

720 rays
Terrain horizon in every direction, out to 250 km

80,353 hours
Sun and Earth positions from JPL Horizons

1.4”
Sky geometry
Worst difference in 58 independent Horizons checks.

0.29 / 0.06 pt
Sun / Earth visibility
Median difference vs NASA LOLA maps at 200 random points, with matching inputs.

19 / 21
Lunar eclipses
Matched NASA catalog events; peak times within 0.9 minute. Two edge grazes missed.

6 / 6
Region positions
All six centres listed in NASA’s Lunar Surface Data Book match to the metre; three newer sites use NASA’s 2024 map.

Limits: clear Earth view is not a radio link budget; battery is an energy estimate; ice is a potential, not a confirmed deposit. No instrument has measured radiation at the south pole.



LRO CRaTER measured quiet background · 2009–2026

Beyond lighting: show permanent-shadow proximity and nearby named terrain; flag eclipses; estimate an unshielded radiation background for the chosen stay. Future radiation rates are explicitly marked as prior-cycle estimates, not astronaut dose predictions.

From lunar data to a *decision you can explain.*

Stand on the exact terrain. Test the landing hour and the full stay. See the next planning option when a date slips.

For mission planners

Compare precise sites, windows, direct Earth view, night survival and radiation assumptions.

For educators and the public

Stand on the terrain, move through time, and ask Navi in English or Arabic.

For scientific scrutiny

Adjust visibility rules, export hourly CSV, and inspect sources, checks and model limits.

Project website ↗ `sayrz1.github.io/lunar-navigator/`

DATA & REFERENCES LOLA terrain · LOLA visibility maps · JPL Horizons · LRO CRaTER · NASA landing regions · Full source list ↗

Choose mission priorities
Adjust score weights for power, Earth view, night survival and water access.

Set visibility rules
Choose Sun-disc and Earth-clearance thresholds.

Keep a baseline
Compare another mission period to your first.

Share or audit
Send a scenario link or download hourly CSV.