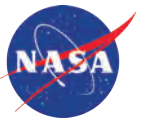




International OBSERVE THE MOON NIGHT 2022

SATURDAY 1ST OCTOBER



NORTHERN HEMISPHERE MOON MAP WITH HUMAN LANDING SITES

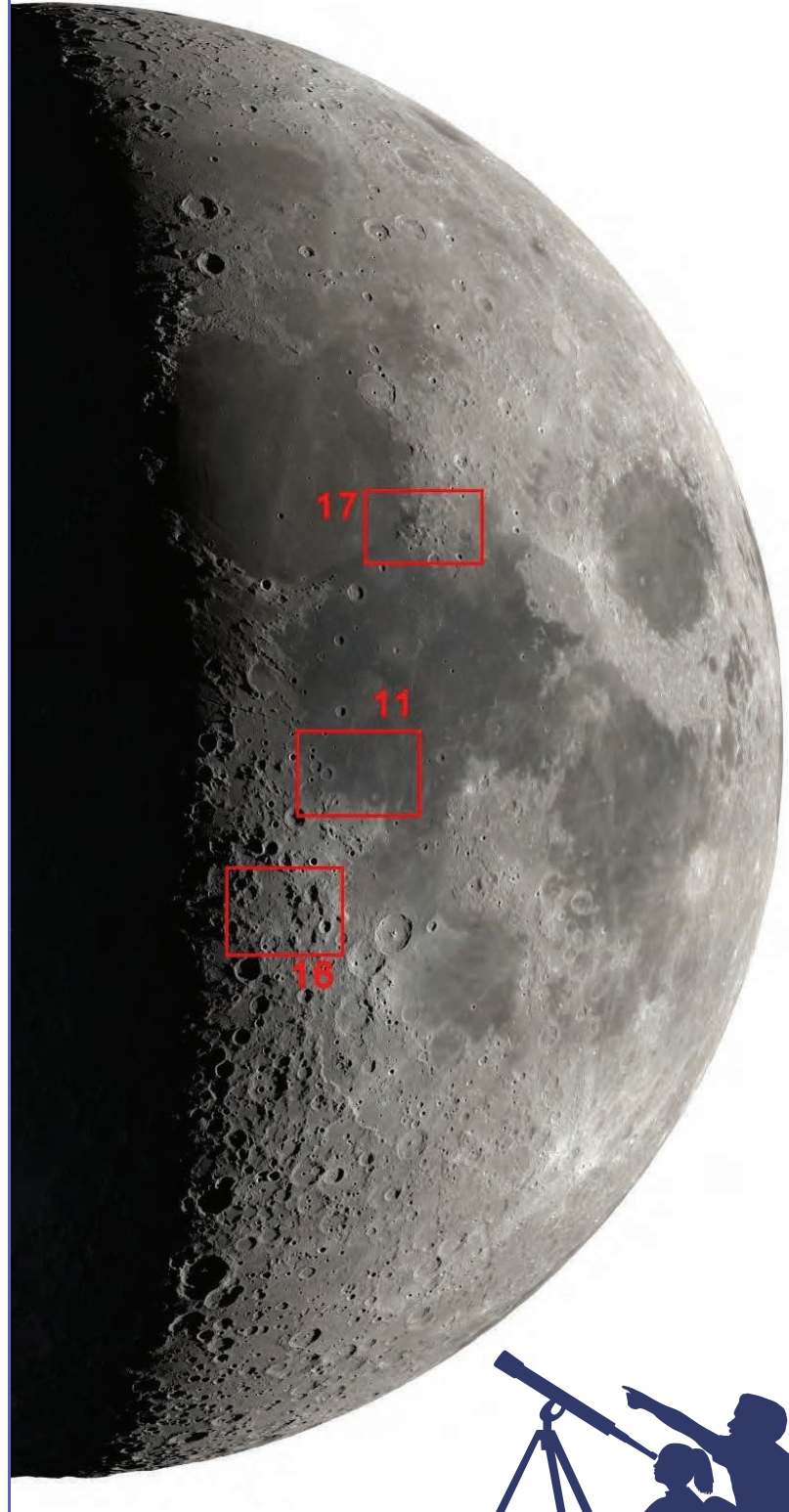
Moon Map

This map depicts the Moon as it will appear from the Northern Hemisphere at approximately 10:00 PM EDT/7:00 PM PDT on October 1, 2022 (02:00 UT Oct 2) but is useful for observing at any time on International Observe the Moon Night. Many of the best views will occur along the terminator (the line between day and night on the Moon).

Human Lunar Landing Sites

Between July 1969 and December 1972, a total of 12 astronauts landed on the surface of the Moon as part of six of the Apollo missions. Apollo missions 11, 12, 14, 15, 16, and 17 landed in different locations on the lunar surface. These locations, each fascinating for their own particular reasons, sampled a wide range of lunar geology and terrain, from smooth volcanic plains, called maria, to rugged ancient highlands. Three of the historic landing sites are visible tonight. Use this map and the magnified charts on the other side of this sheet to find and observe them.

This map can be used any time on International Observe the Moon Night, or a nearby date, but it was made showing the Moon at exactly 10pm EDT.



Map generated with NASA's Dial-A-Moon
(<https://svs.gsfc.nasa.gov/4955>)



Selected Objects for Telescopic Viewing



Apollo 11: The first human landing site was on the smooth, flat plains of Mare Tranquillitatis (Sea of Tranquility). The region was selected because it is relatively smooth and flat - but even so, astronauts Armstrong and Aldrin had to maneuver their lander during the last minutes of their descent in order to avoid a field of giant boulders.

Apollo 11 Site: Mare Tranquillitatis
Commander: Neil A. Armstrong
Command Module Pilot: Michael Collins
Lunar Module Pilot: Edwin E. Aldrin Jr.
Command Module: Columbia
Lunar Module: Eagle
Mission Duration: July 16, 1969 - July 24, 1969



Apollo 16: This was the first and only mission to land in the rugged lunar highlands. In April 1972, astronauts Young and Duke collected rock samples more than four billion years old. These showed that the ancient lunar crust formed from rock that crystallized and floated to the top of a global lunar magma ocean.

Apollo 16 Site: Descartes Highlands
Commander: John W. Young
Command Module Pilot: Thomas K. Mattingly II
Lunar Module Pilot: Charles M. Duke Jr.
Command Module: Casper
Lunar Module: Orion
Mission Duration: April 16, 1972 - April 27, 1972



Apollo 17: The final Apollo mission to land on the Moon visited the spectacular Taurus-Littrow Valley, deeper than Earth's Grand Canyon. In December 1972, astronauts Cernan and Schmitt (the first professional geologist on the Moon) explored an active fault and a gigantic landslide deposit, and brought back samples that included beads of volcanic glass from an ancient lunar fire fountain.

Apollo 17 Site: Taurus-Littrow
Commander: Eugene A. Cernan
Command Module Pilot: Ronald E. Evans
Lunar Module Pilot: Harrison H. Schmitt
Command Module: America
Lunar Module: Challenger
Mission Duration: December 7, 1972 - December 19, 1972





International OBSERVE THE MOON NIGHT 2022

SATURDAY 1ST OCTOBER



NORTHERN HEMISPHERE MOON MAP WITH LUNAR MARIA (SEAS OF BASALT)

Moon Map

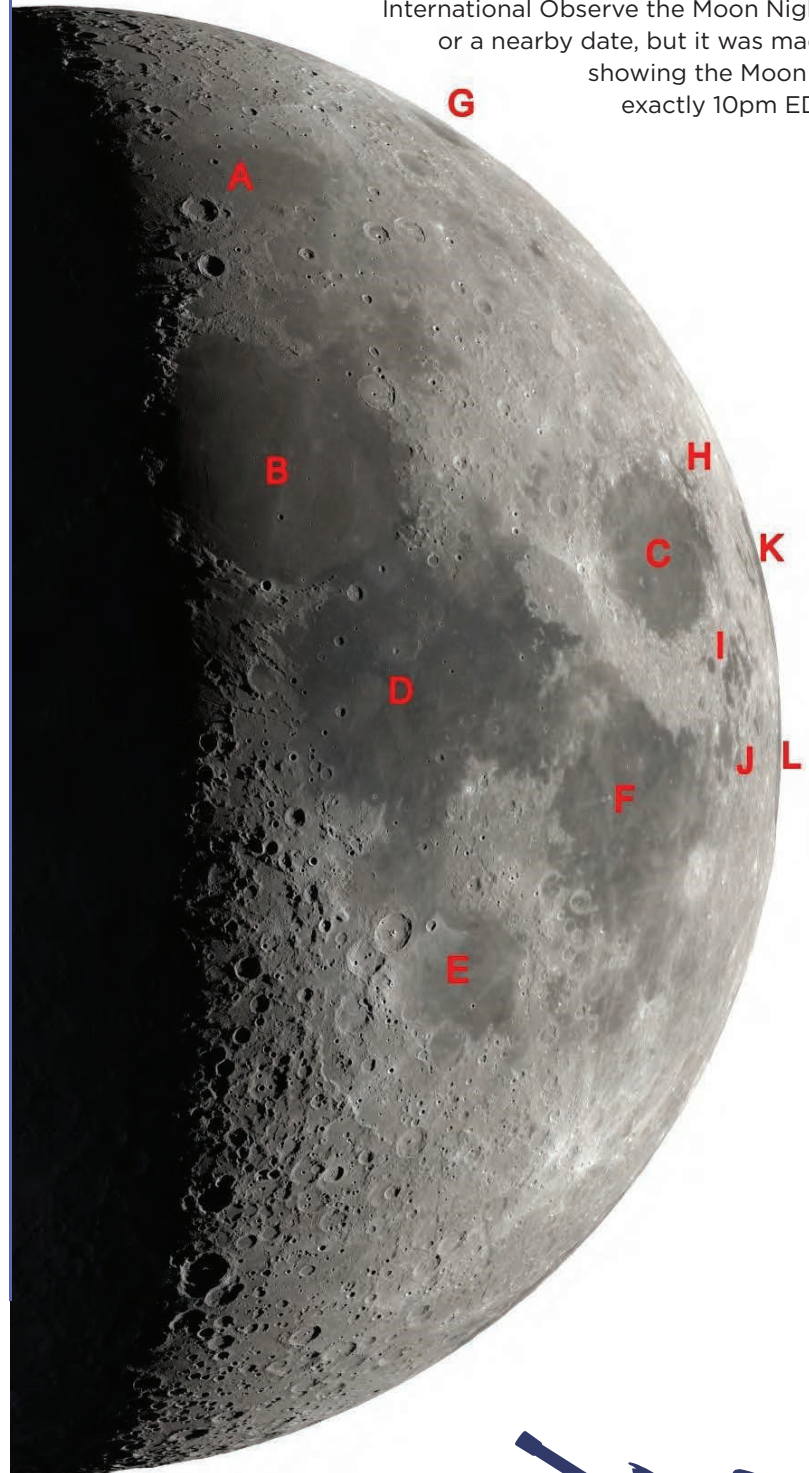
This map depicts the Moon as it will appear from the Northern Hemisphere at approximately 10:00 p.m. EDT/7:00 p.m. PDT on International Observe the Moon Night, October 1, 2022 (02:00 UT Oct 2). Many of the best views will occur along the terminator (the line between day and night on the Moon).

Lunar Maria (Seas of Basalt)

You can see a number of maria tonight. Once thought to be seas of water, these are actually large, flat plains of solidified lava. They can be viewed using binoculars or even with the unaided eye. Some of the maria are circular, hinting at origins from giant asteroid impacts that created great basins that were later flooded with lava. Other maria are irregular and have more mysterious origins. Tonight, you may be able to identify 12 maria on the near side of the Moon. This includes three seas along the eastern edge that are often hard to see. Mare Humboldtianum (G), on the Moon's northeast edge, will be the easiest of the three. More challenging will be the thin sliver of part of Mare Marginis (K) visible east of Mare Crisium. Observers with telescopes may just barely be able to see a very thin darkening at the far eastern edge of the Moon's near side, marking the extreme western edge of Mare Smythii.

- A. Mare Frigoris (Sea of Cold)
- B. Mare Serenitatis (Sea of Serenity)
- C. Mare Crisium (Sea of Crises)
- D. Mare Tranquillitatis (Sea of Tranquility)
- E. Mare Nectaris (Sea of Nectar)
- F. Mare Fecunditatis (Sea of Fertility)
- G. Mare Humboldtianum (Humboldt's Sea)
- H. Mare Anguis (Serpent Sea)
- I. Mare Undarum (Sea of Waves)
- J. Mare Spumans (Sea of Foam)
- K. Mare Marginis (Border Sea)
- L. Mare Smythii (Smyth's Sea)

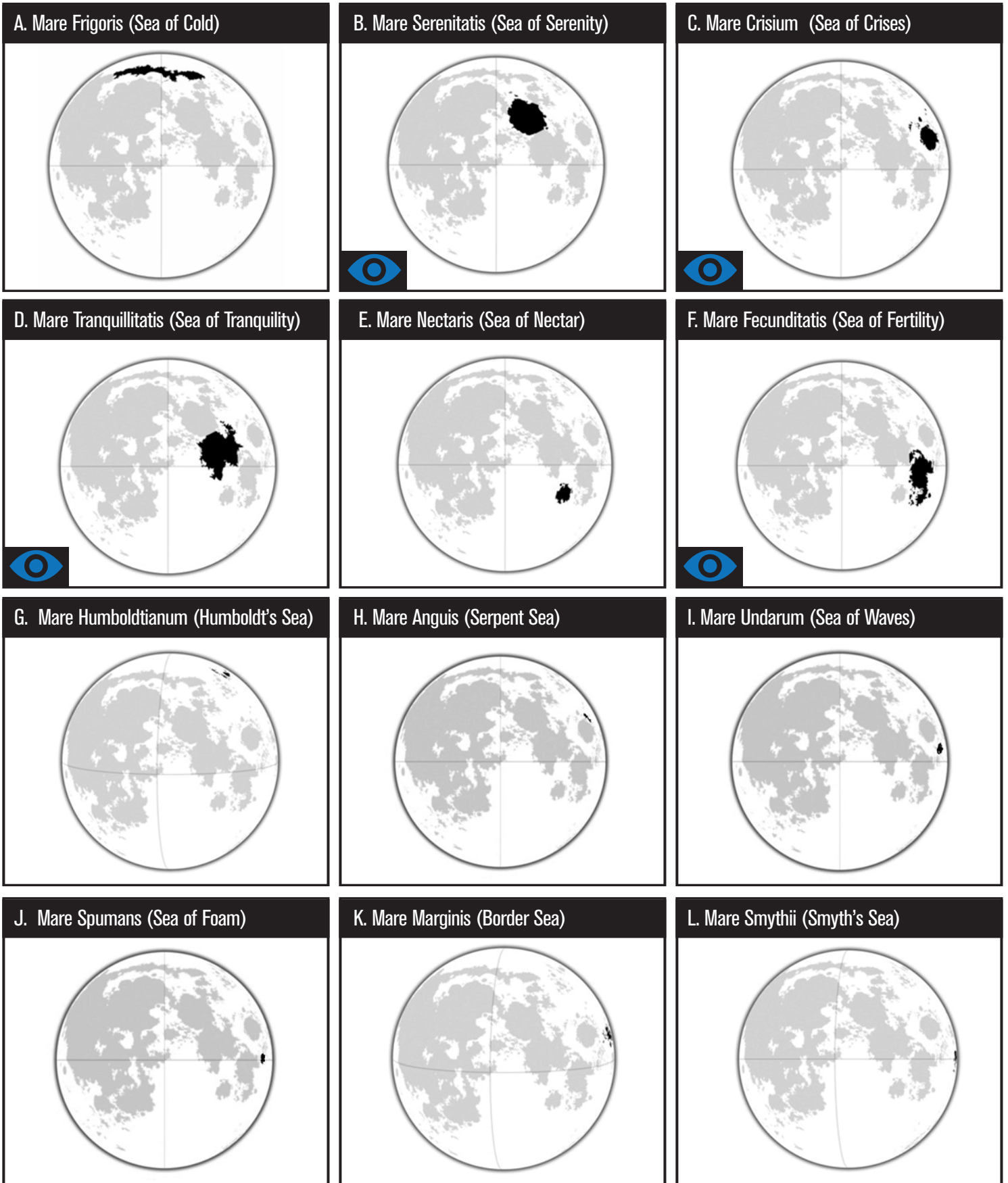
This map can be used any time on International Observe the Moon Night, or a nearby date, but it was made showing the Moon at exactly 10pm EDT.



Map generated with NASA's Dial-A-Moon (<https://svs.gsfc.nasa.gov/4955>)



INTERNATIONAL OBSERVE THE MOON NIGHT 2022–The Lunar Maria (Seas of Basalt)



These charts show the 12 lunar seas that are at least partially visible on the Moon tonight, with north up and lunar west to the left. Some of the larger seas might be easy to see with your unaided eyes, indicated by the icons. Other smaller seas may provide challenges even through binoculars. Combine these charts with the accompanying map to see how many of the Moon's maria you can track down tonight!



International OBSERVE
THE **MOON** NIGHT 2022

SATURDAY 1ST
OCTOBER

**NORTHERN HEMISPHERE MOON MAP
SELECTED OBJECTS FOR TELESCOPIC VIEWING**

Moon Map

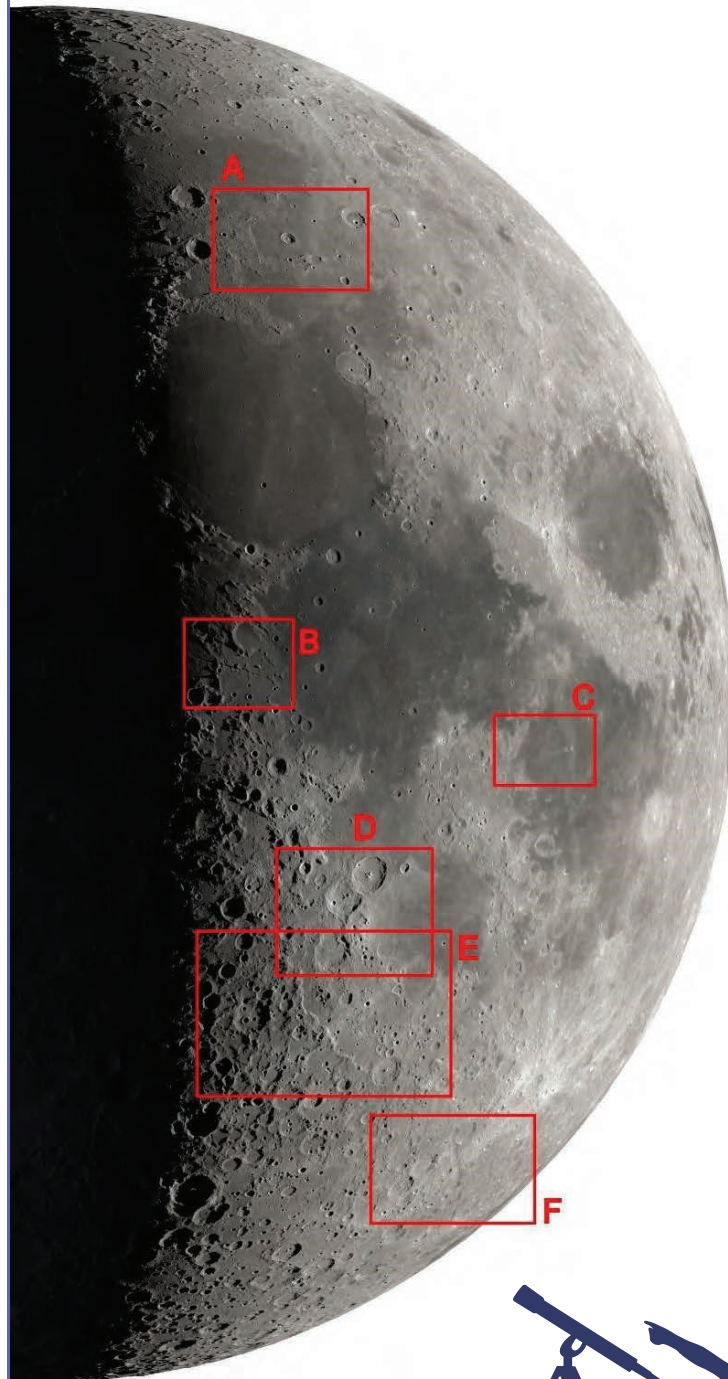
This map depicts the Moon as it will appear from the Northern Hemisphere at approximately 10:00 PM EDT/7:00 PM PDT on International Observe the Moon Night, October 1, 2022 (2:00 AM UTC on October 2). Many of the best views will occur along the terminator (the line between day and night on the Moon).

Selected Telescopic Objects

Some interesting lunar landforms that have favorable lighting for viewing tonight are identified here. Details about each are on the reverse side of this map.

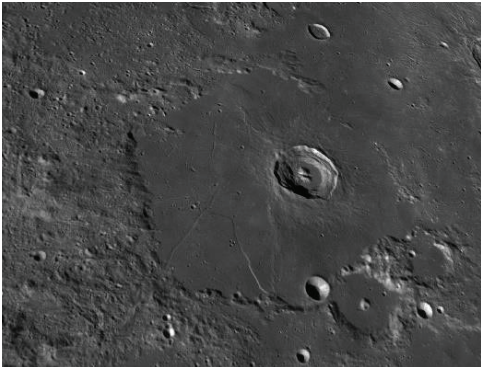
- A. Lacus Mortis (Lake of Death)
- B. Rima Ariadaeus (Ariadaeus Rille)
- C. Messier Crater
- D. Theophilus, Cyrillus, and Catharina Craters
- E. Rupes Altai (Altai Scarp)
- F. Vallis Rheita (Rheita Valley)

This map can be used any time on International Observe the Moon Night, or a nearby date, but it was made showing the Moon at exactly 10pm EDT.



Map generated with NASA's Dial-A-Moon
(<https://svs.gsfc.nasa.gov/4955>)

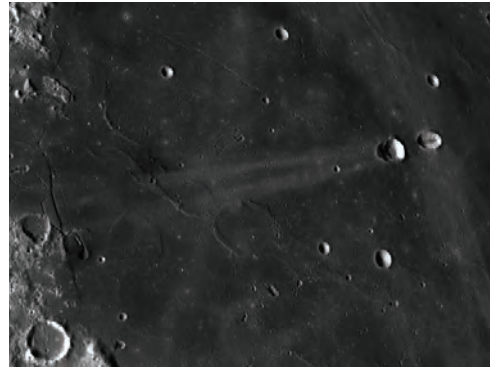
Selected Objects for Telescopic Viewing



A. Lacus Mortis, the “Lake of Death,” is a lava plain about 100 miles (160 km) across. It was chosen as a landing site for NASA’s Commercial Lunar Payload Services program. Near the lava plain’s center is the crater Burg, 25 miles (40 km) in diameter. West of Burg, Lacus Mortis’ floor is broken by a fascinating network of fractures and ridges.



B. Ariadaeus Rille: This is one of the Moon’s best examples of a channel-like dent in the lunar crust, called a straight rille. Running roughly east to west, it appears as a great fracture, measuring about 136 miles (220 km) long, 2.5 miles (4 km) wide, and 0.5 miles (0.8 km) deep. It’s an example of a graben, where a long block of land drops down between two parallel faults. It may have been formed by rising magma wedging open a crack in the lunar crust.



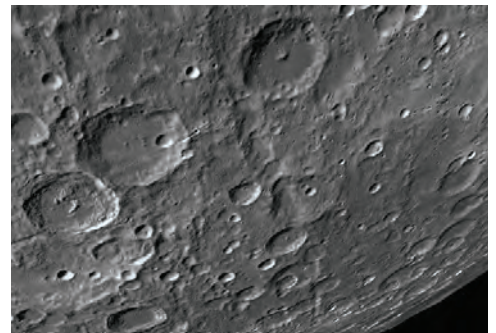
C. Messier Crater: This young, small crater is oblong in shape, measuring 6 by 9 miles across (10 by 15 km). About 14 miles (23 km) to its west, along the line of Messier’s long axis, is a similarly sized crater, Messier A. Continuing over 62 miles (100 km) to the west from Messier A is a pair of bright rays of pulverized, ejected rock. The crater shapes, their orientation, and the highly directional ejecta indicate this pattern was formed by an impacting asteroid skimming in at a very low angle.



D. Theophilus, Cyrillus, & Catharina Craters: This prominent trio of craters with similar sizes (62-mile or 100-km diameters) but different ages illustrates how lunar craters degrade over time. Theophilus, the youngest and northernmost, has well-preserved terraced walls, a flat floor, and central peaks. Cyrillus’ northeast wall is breached by Theophilus. Catharina is oldest, scarred by later impacts.



E. Altai Scarp: This spectacular cliff face is formed by the southwestern rim of an outer ring of the multi-ring Nectaris impact basin, which is partly filled by the lava plains of Mare Nectaris to the northeast. The scarp reaches about 2.5 miles (4 km) in height and traces a curving path roughly 310 miles (500 km) long.



F. Rheita Valley: This long, deep trough stretches over 250 miles (400 km), reaches more than 18.6 miles (30 km) width, and is more than 1.5 miles (2.5 km) deep. A clue to its origin comes from its orientation, pointing outward from the Nectaris impact basin. The valley is actually an overlapping chain of secondary impact craters formed by debris violently blasted out from the great Nectaris impact. The Rheita Valley is the most prominent of many similar scars in this area.