National Aeronautics and Space Administration

International Observe the Moon Night 2025

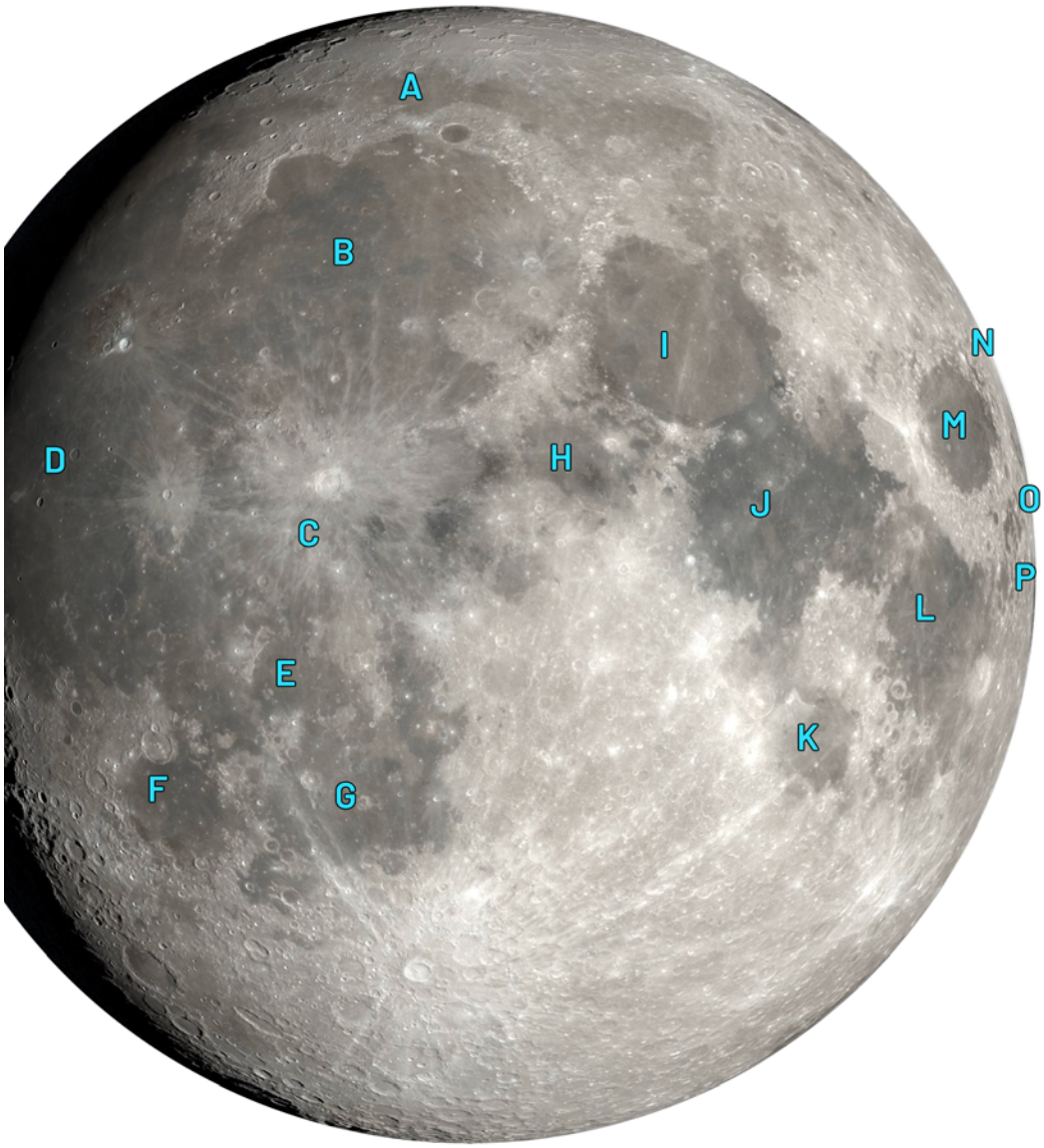
LUNAR MARIA (SEAS) • NORTHERN HEMISPHERE • SATURDAY, OCTOBER 4

Moon Map

This map depicts the Moon as it will appear from the northern hemisphere at approximately 8:00 PM EDT and 5:00 PM PDT on International Observe the Moon Night, October 4, 2025 (00:00 UTC October 5).

Lunar Maria (Seas)

You can see a number of maria tonight.
Once thought to be seas of water, these are actually large, flat plains of solidified basaltic lava. They can be viewed in binoculars or even with the unaided eye. Tonight, you may be able to identify 16 maria on the near side of the Moon.



- **A** **Mare Frigoris** (Sea of Cold)
- **B** **Mare Imbrium** (Sea of Rains)
- **C** **Mare Insularum** (Sea of Isles)
- **D** **Oceanus Procellarum** (Sea of Storms)
- **E** **Mare Cognitum** (Known Sea)
- **F** **Mare Humorum** (Sea of Moisture)
- **G** **Mare Nubium** (Sea of Clouds)
- **H** **Mare Vaporum** (Sea of Vapors)
- **I** **Mare Serenitatis** (Sea of Serenity)
- **J** **Mare Tranquillitatis** (Sea of Tranquility)
- **K** **Mare Nectaris** (Sea of Nectar)
- **L** **Mare Fecunditatis** (Sea of Fertility)
- **M** **Mare Crisium** (Sea of Crises)
- **N** **Mare Anguis** (Serpent Sea)
- **O** **Mare Undarum** (Sea of Waves)
- **P** **Mare Spumans** (Sea of Foam)

This map is designed for use on October 4, 2025, but can be used on nearby dates or anytime the Moon is at or near the same phase.

Map generated with NASA's Moon Phase and Libration, 2025 (https://svs.gsfc.nasa.gov/5415)

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These charts show the positions and extents of the 16 lunar seas visible on the Moon tonight, with north up and lunar west to the left. You may be able to find the larger seas without any special equipment. Smaller seas may be challenging to find even through binoculars. Combine these charts with the map on the previous page and see how many of the Moon's maria you can track down tonight!

National Aeronautics and Space Administration

International Observe the Moon Night 2025

HUMAN LANDING SITES • NORTHERN HEMISPHERE • SATURDAY, OCTOBER 4

Moon Map

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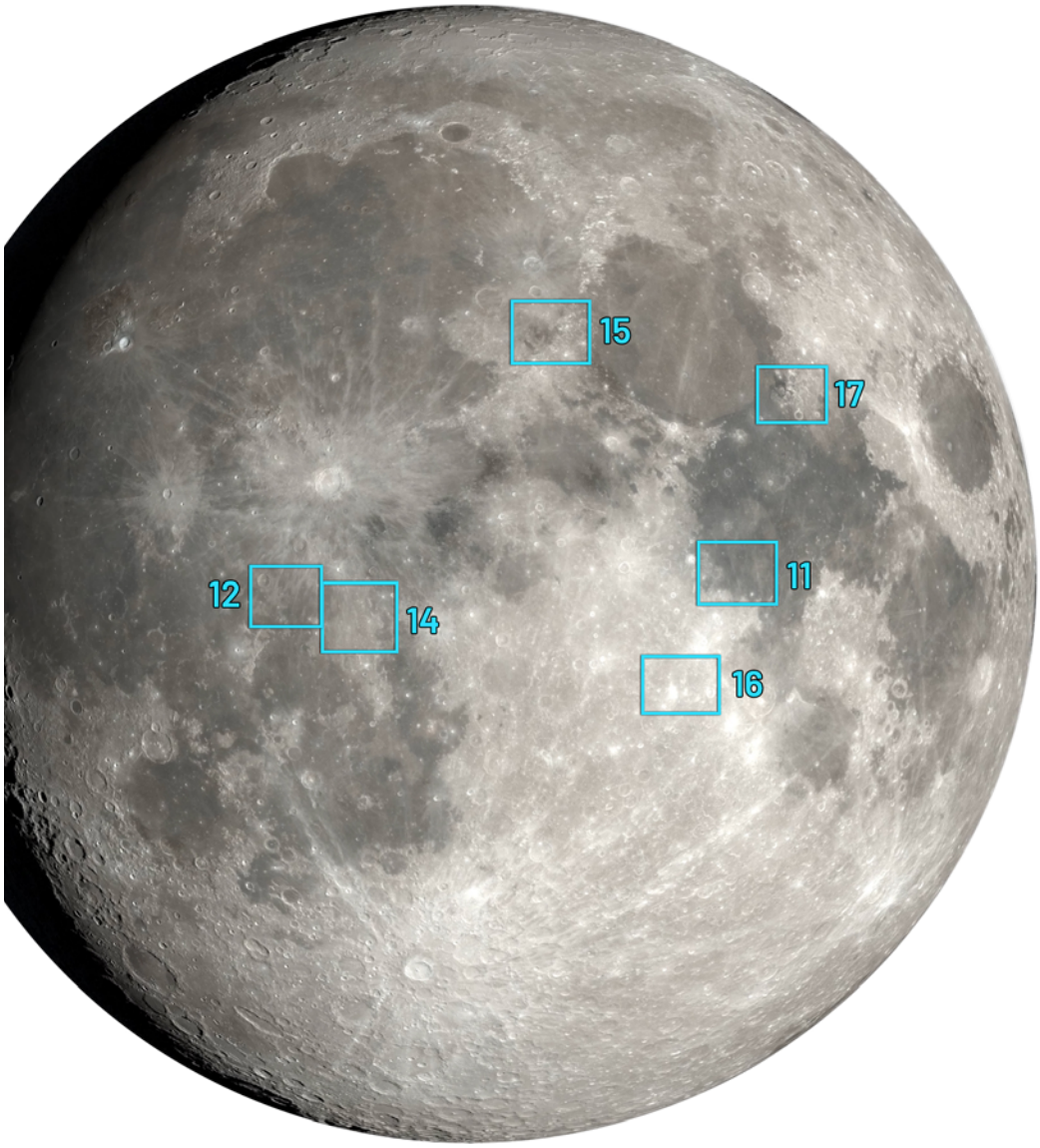
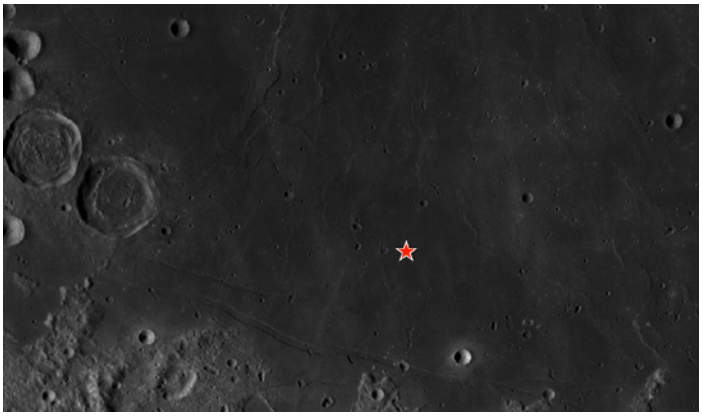


Lunar Landing Sites

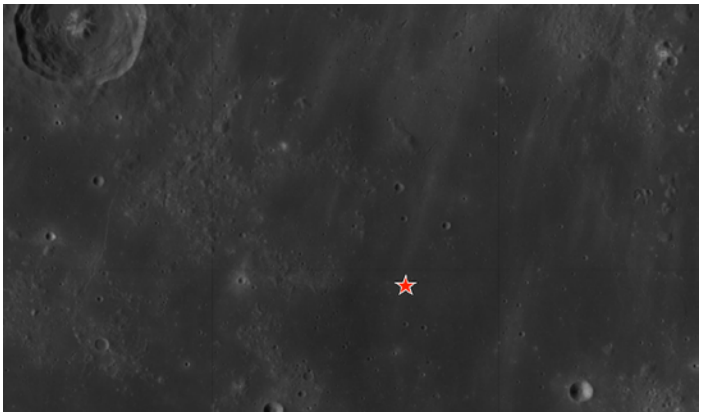
Between July 1969 and December 1972 a total of 12 astronauts landed on the surface of the Moon for six of the Apollo missions. Apollo missions 11, 12, 14, 15, 16, and 17 each landed in different locations on the lunar surface. These locations, each fascinating for their own particular reasons, sampled a wide range of lunar geology and terrain, from smooth mare plains to rugged ancient highlands. All six landing sites are visible tonight. Use this map and the magnified images on the next page to find and observe these historic sites.

Map generated with NASA's Moon Phase and Libration, 2025 (https://svs.gsfc.nasa.gov/5415)



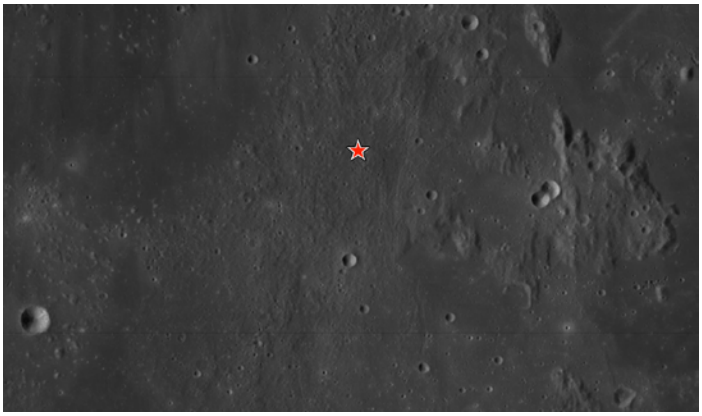
Apollo 11

The first human landing site was on the smooth flat plains of the Sea of Tranquility. Despite how flat the area looks from Earth and from lunar orbit, astronauts Neil Armstrong and Edwin "Buzz" Aldrin had to maneuver their lander at the last minutes of their descent in order to avoid a field of giant boulders.



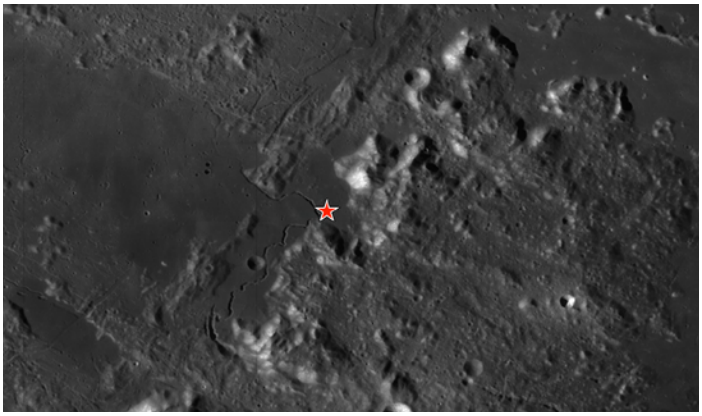
Apollo 12

In November 1969, a pinpoint landing brought astronauts Charles "Pete" Conrad and Alan Bean down next to the robotic Surveyor 3 spacecraft, which had landed there in April 1967. The astronauts collected samples of material blasted from the formation of Copernicus crater over 350 km away and 800 million years ago.



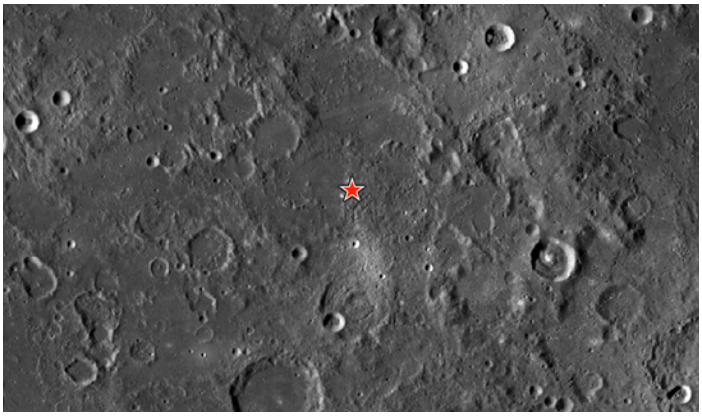
Apollo 14

Astronauts Alan Shepard and Edgar Mitchell landed in a broad expanse of low, rolling hills in February 1971. Rock samples returned by the mission told the story of how this landscape was formed nearly 4 billion years ago by debris blasted from the formation of the basin now occupied by Mare Imbrium.



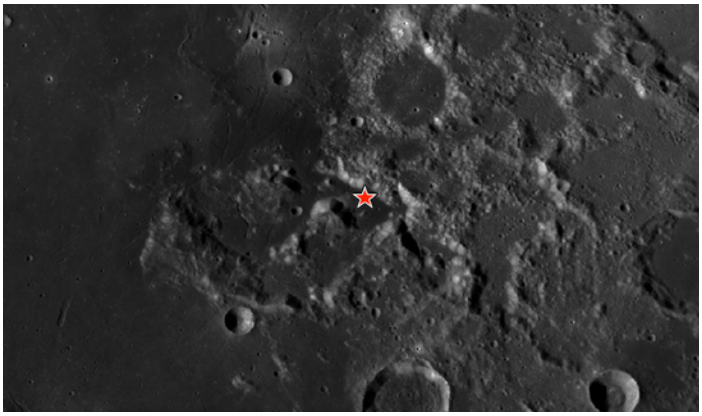
Apollo 15

In July 1971, astronauts David Scott and James Irwin landed at the edge of Mare Imbrium at the base of the towering Apennine Mountains. Driving their rover across the mare and up the lower mountain slope, they gathered samples from the dark plains and the surrounding, light-colored lunar highlands.



Apollo 16

This was the first and only mission to land in the rugged lunar highlands. In April 1972, astronauts John Young and Charles Duke collected rock samples more than 4 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 17

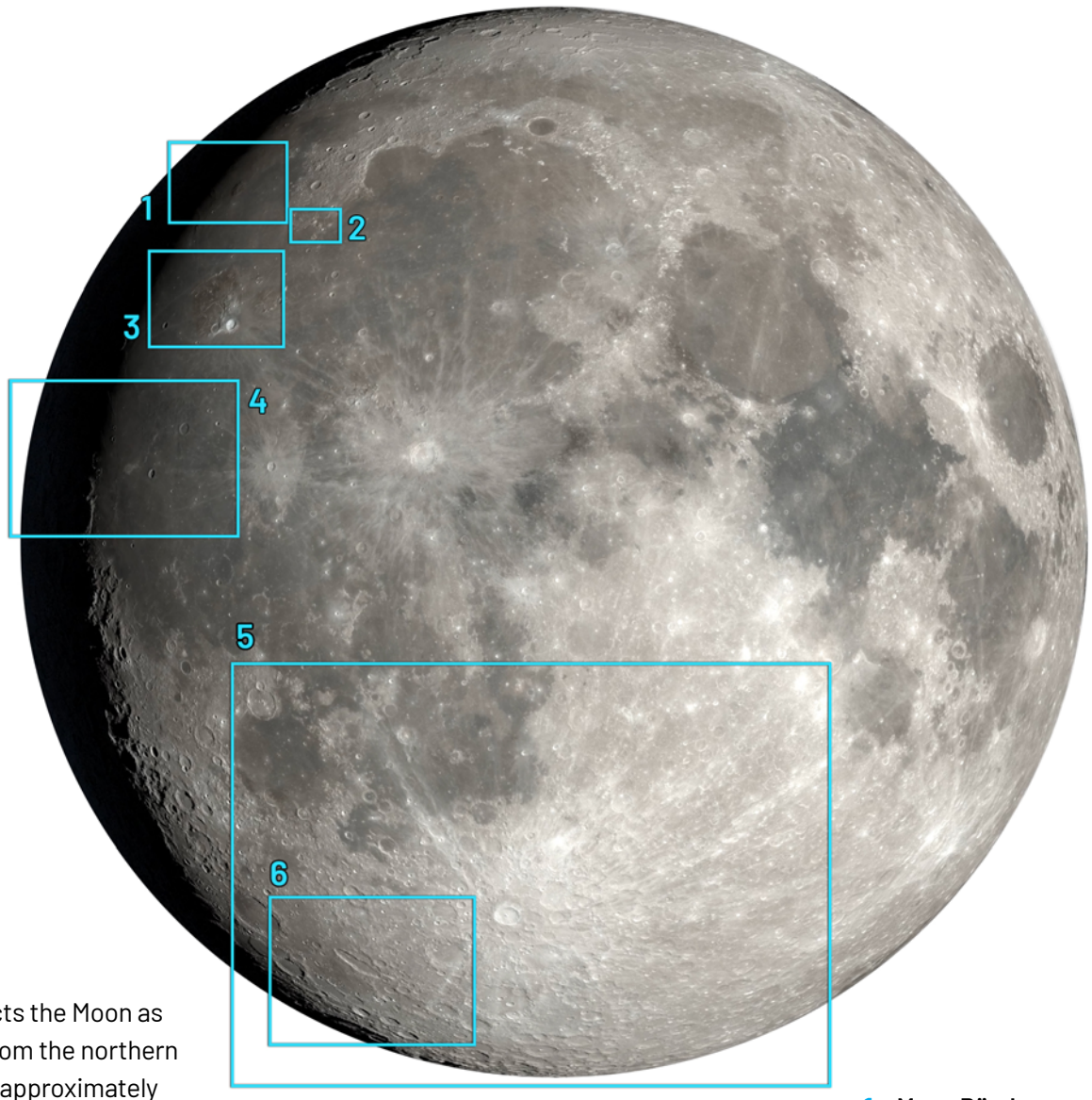
The final Apollo mission to land on the Moon visited the spectacular Taurus-Littrow Valley, deeper than Earth's Grand Canyon. In December 1972, astronauts Eugene Cernan and Harrison "Jack" Schmitt (the first professional geologist on the Moon) explored an active fault scarp, a gigantic landslide deposit,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

North is up and lunar west to the left in these close-up views. These images were provided by NASA's Moon Trek portal: https://trek.nasa.gov/moon

National Aeronautics and Space Administration

International Observe the Moon Night 2025

SELECTED OBJECTS FOR TELESCOPIC VIEWING · NORTHERN HEMISPHERE · SATURDAY, OCTOBER 4



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Selected Telescopic Objects

Some of the more interesting lunar landforms that have favorable lighting for viewing tonight are identified here. Details for each are on the next page.

Map generated with NASA's Moon Phase and Libration, 2025 (https://svs.gsfc.nasa.gov/5415)

1 **Mons Rümker**

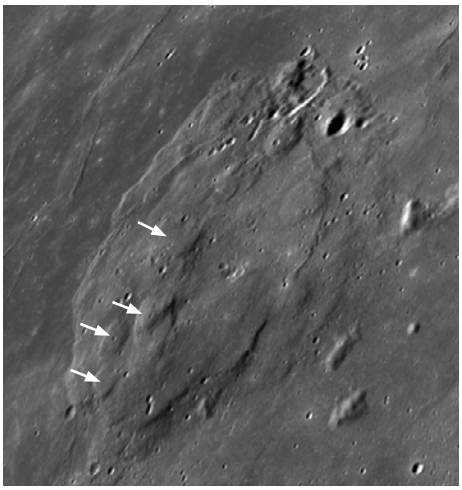
2 **Gruithuisen Domes**

3 **Aristarchus Plateau**

4 **Reiner Gamma**

5 **Tycho Crater**

6 **Schiller Crater**

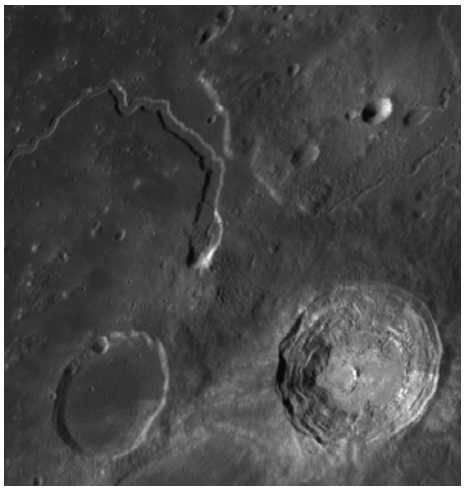


1. Mons Rümker

This subtle feature is a remarkable complex of 20 to 30 overlapping, shallow-sloped volcanic domes (see arrows) seemingly piled upon each other. The complex measures about 70 kilometers across and its highest point stands about 1,300 meters above the surrounding plains. It is a low, flat feature, with 75% of the region having slopes of less than 3 degrees. This will be a fun and unique challenge object for telescopic observers this year!

2. Gruithuisen Domes

These very unusual volcanoes were formed by thicker lava than is typical on the Moon. As a result, they stand taller (1,800 m) and are steeper than average lunar volcanoes. Two large domes are most easily visible. Mons Gruithuisen Delta lies to the east (right in this view) of Mons Gruithuisen Gamma. A third, smaller volcano, Mons Gruithuisen NW, lies to the northwest (upper left in this view) of Mons Gruithuisen Gamma.

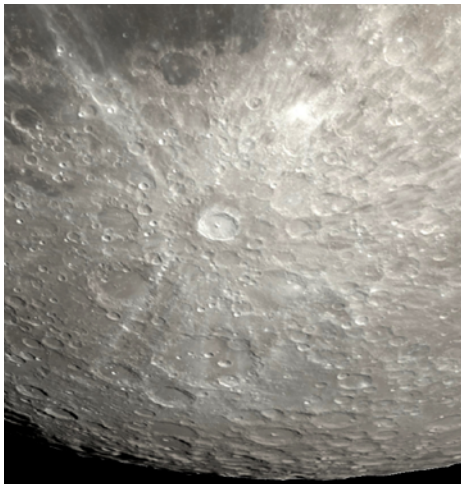


3. Aristarchus Plateau

This region is a geologic wonderland on the Moon! Aristarchus Crater (40 km diameter) is a relatively deep, young, and fresh impact crater with beautifully terraced walls and a sharp central peak. Herodotus, to the west, has a slightly smaller diameter, but is older and partially flooded by lava. North of both is the blocky, volcanic Aristarchus Plateau, blanketed in dark volcanic ash. Cutting through the plateau is Schröter's Valley, one of the most spectacular examples of a sinuous rille, a 160 km channel cut by flowing lava.

4. Reiner Gamma

Reiner Gamma is the best known example of a lunar swirl, delicate, sinuous, bright and dark bands snaking across local patches on the Moon. What is the cause of these strange features? The simple answer is we don't know. But we do have a fascinating clue. Unlike the Earth, the Moon does not have a global magnetic field shielding it from intense particle radiation coming from space. But the Moon does have small areas of localized magnetic fields. The lunar swirls we have identified all seem to have formed in areas of local magnetic fields.



5. Tycho Crater

Measuring 85 km across, Tycho is a spectacular example of a complex impact crater. It has a sharp, towering central peak rising from a deep, flat floor. The inner faces of the crater's rim are broken into series of terraces stepping down to the crater floor. Tycho's details are so sharp and well defined because it is young and fresh, estimated at only 108 million years old. That's young for a lunar crater! Surrounding the crater is a pattern of scoured scars and bright rays of pulverized rock ejected by the impact.

6. Schiller Crater

Near the Moon's limb or visible edge, all craters look like ovals due to viewing geometry. But Schiller is a particularly extreme example. That is because Schiller actually is an oval, measuring 179 x 71 km, making it the least circular large crater on the Moon. Its origin remains a mystery. Was it formed by a single large impactor coming in at a very low angle, or by multiple overlapping impacts? All current proposed explanations lack definitive evidence. Look closely and see what you think.

North is up and lunar west to the left in these close-up views. These images were provided by NASA's Moon Trek portal: https://trek.nasa.gov/moon