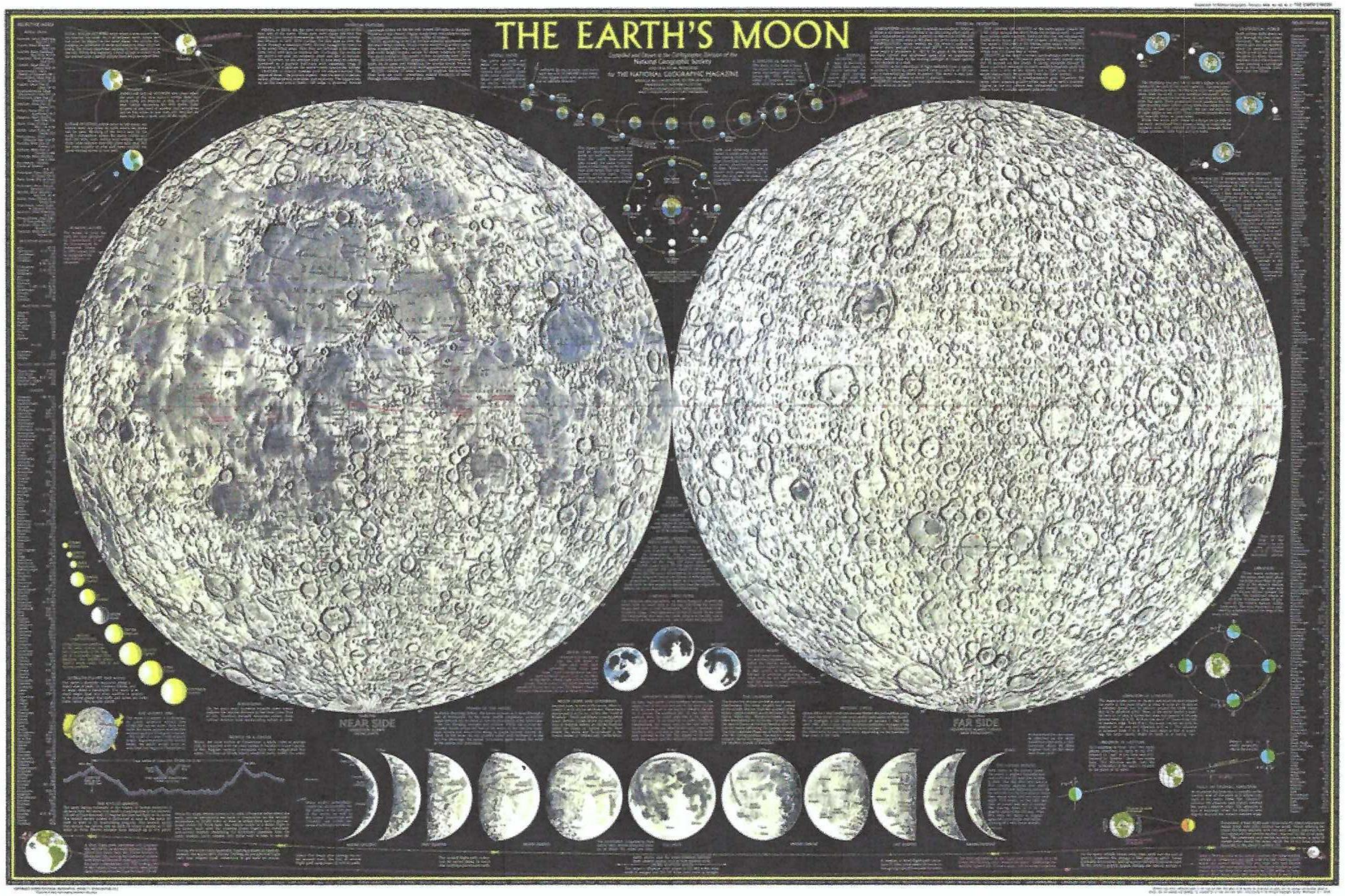
THE EARTH'S MOON
NEAR SIDE
FAR SIDE

The Moon is an astronomical body that orbits Earth as its only natural satellite. It is the fifth-largest satellite in the Solar System, and the largest among planetary satellites relative to the size of the planet that it orbits (its primary). The Moon is, after Jupiter's satellite Io, the second-densest satellite in the Solar System among those whose densities are known.

The Moon is thought to have formed about 4.51 billion years ago, not long after Earth. The most widely accepted explanation is that the Moon formed from the debris left over after a giant impact between Earth and a Mars-sized body called Theia. New research of Moon rocks, although not rejecting the Theia hypothesis, suggests that the Moon may be older than previously thought.[13]

The Moon is in synchronous rotation with Earth, and thus always shows the same side to Earth, the near side. The near side is marked by dark volcanic maria that fill the spaces between the bright ancient crustal highlands and the prominent impact craters. After the Sun, the Moon is the second-brightest regularly visible celestial object in Earth's sky. Its surface is actually dark, although compared to the night sky it appears very bright, with a reflectance just slightly higher than that of worn asphalt. Its gravitational influence produces the ocean tides, body tides, and the slight lengthening of the day.

The Moon's average orbital distance is 384,402 km (238,856 mi),[14][15] or 1.28 light-seconds. This is about thirty times the diameter of Earth. The Moon's apparent size in the sky is almost the same as that of the Sun, since the star is about 400 times the lunar distance and diameter. Therefore, the Moon covers the Sun nearly precisely during a total solar eclipse. This matching of apparent visual size will not continue in the far future because the Moon's distance from Earth is gradually increasing.

The Moon was first reached in September 1959 by the Soviet Union's Luna 2, an unmanned spacecraft, followed by the first successful soft landing by Luna 9 in 1966. The United States' NASA Apollo program achieved the only manned lunar missions to date, beginning with the first manned orbital mission by Apollo 8 in 1968, and six manned landings between 1969 and 1972, with the first being Apollo 11 in July 1969. These missions returned lunar rocks which have been used to develop a geological understanding of the Moon's origin, internal structure, and the Moon's later history. Since the 1972 Apollo 17 mission the Moon has been visited only by unmanned spacecraft.

Both the Moon's natural prominence in the earthly sky and its regular cycle of phases as seen from Earth have provided cultural references and influences for human societies and cultures since time immemorial. Such cultural influences can be found in language, lunar calendar systems, art, and mythology.

Thus, the Moon belongs to everybody.

The usual English proper name for Earth's natural satellite is "the Moon", which in nonscientific texts is usually not capitalized.[16][17][18][19][20] The noun moon is derived from Old English mōna, which (like all Germanic language cognates) stems from Proto-Germanic *mēnô, which comes from Proto-Indo-European *mḗh_1n̥s "moon", "month", which comes from the Proto-Indo-European root *meh_1- "to measure", the month being the ancient unit of time measured by the Moon.[21][22] Occasionally, the name "Luna" is used. In literature, especially science fiction, "Luna" is used to distinguish it from other moons, while in poetry, the name has been used to denote personification of Earth's moon.[23]

The modern English adjective pertaining to the Moon is lunar, derived from the Latin word for the Moon, luna. The adjective selenic (usually only used to refer to the chemical element selenium) is so rarely used to refer to the Moon that this meaning is not recorded in most major dictionaries.[24][25][26] It is derived from the Ancient Greek word for the Moon, σελήνη (selḗnē), from which is however also derived the prefix "seleno-", as in selenography, the study of the physical features of the Moon, as well as the element name selenium.[27][28] Both the Greek goddess Selene and the Roman goddess Diana were alternatively called Cynthia.[29] The names Luna, Cynthia, and Selene are reflected in terminology for lunar orbits in words such as apolune, pericynthion, and selenocentric. The name Diana comes from the Proto-Indo-European *diw-yo, "heavenly", which comes from the PIE root *dyeu- "to shine," which in many derivatives means "sky, heaven, and god" and is also the origin of Latin dies, "day".

The Moon is a differentiated body. It has a geochemically distinct crust, mantle, and core. The Moon has a solid iron-rich inner core with a radius possibly as small as 240 kilometres (150 mi) and a fluid outer core primarily made of liquid iron with a radius of roughly 300 kilometres (190 mi). Around the core is a partially molten boundary layer with a radius of about 500 kilometres (310 mi).[53][54] This structure is thought to have developed through the fractional crystallization of a global magma ocean shortly after the Moon's formation 4.5 billion years ago.[55]

Crystallization of this magma ocean would have created a mafic mantle from the precipitation and sinking of the minerals olivine, clinopyroxene, and orthopyroxene; after about three-quarters of the magma ocean had crystallised, lower-density plagioclase minerals could form and float into a crust atop.[56] The final liquids to crystallise would have been initially sandwiched between the crust and mantle, with a high abundance of incompatible and heat-producing elements.[1]

Consistent with this perspective, geochemical mapping made from orbit suggests the crust of mostly anorthosite.[12] The Moon rock samples of the flood lavas that erupted onto the surface from partial melting in the mantle confirm the mafic mantle composition, which is more iron-rich than that of Earth.[1] The crust is on average about 50 kilometres (31 mi) thick.[1]

The Moon is the second-densest satellite in the Solar System, after Io.[57] However, the inner core of the Moon is small, with a radius of about 350 kilometres (220 mi) or less,[1] around 20% of the radius of the Moon. Its composition is not well understood, but is probably metallic iron alloyed with a small amount of sulphur and nickel; analyzes of the Moon's time-variable rotation suggest that it is at least partly molten.

The topography of the Moon has been measured with laser altimetry and stereo image analysis.[59] Its most visible topographic feature is the giant far-side South Pole–Aitken basin, some 2,240 km (1,390 mi) in diameter, the largest crater on the Moon and the second-largest confirmed impact crater in the Solar System.[60][61] At 13 km (8.1 mi) deep, its floor is the lowest point on the surface of the Moon.[60][62] The highest elevations of the surface are located directly to the northeast, and it has been suggested might have been thickened by the oblique formation impact of the South Pole–Aitken basin.[63] Other large impact basins such as Imbrium, Serenitatis, Crisium, Smythii, and Orientale also possess regionally low elevations and elevated rims.[60] The far side of the lunar surface is on average about 1.9 km (1.2 mi) higher than that of the near side.[1]

The discovery of fault scarp cliffs by the Lunar Reconnaissance Orbiter suggest that the Moon has shrunk within the past billion years, by about 90 metres (300 ft).[64] Similar shrinkage features exist on Mercury. A recent study of over 12000 images from the orbiter has observed that Mare Frigoris near the north pole, a vast basin assumed to be geologically dead, has been cracking and shifting. Since the Moon doesn't have tectonic plates, its tectonic activity is slow and cracks develop as it loses heat over the years.

The dark and relatively featureless lunar plains, clearly seen with the naked eye, are called maria (Latin for "seas"; singular mare), as they were once believed to be filled with water;[66] they are now known to be vast solidified pools of ancient basaltic lava. Although similar to terrestrial basalts, lunar basalts have more iron and no minerals altered by water.[67] The majority of these lavas erupted or flowed into the depressions associated with impact basins. Several geologic provinces containing shield volcanoes and volcanic domes are found within the near side "maria".[68]

Evidence of young lunar volcanism

Almost all maria are on the near side of the Moon, and cover 31% of the surface of the near side,[69] compared with 2% of the far side.[70] This is thought to be due to a concentration of heat-producing elements under the crust on the near side, seen on geochemical maps obtained by Lunar Prospector's gamma-ray spectrometer, which would have caused the underlying mantle to heat up, partially melt, rise to the surface and erupt.[56][71][72] Most of the Moon's mare basalts erupted during the Imbrian period, 3.0–3.5 billion years ago, although some radiometrically dated samples are as old as 4.2 billion years.[73] Until recently, the youngest eruptions, dated by crater counting, appeared to have been only 1.2 billion years ago.[74] In 2006, a study of Ina, a tiny depression in Lacus Felicitatis, found jagged, relatively dust-free features that, because of the lack of erosion by infalling debris, appeared to be only 2 million years old.[75] Moonquakes and releases of gas also indicate some continued lunar activity.[75] In 2014 NASA announced "widespread evidence of young lunar volcanism" at 70 irregular mare patches identified by the Lunar Reconnaissance Orbiter, some less than 50 million years old. This raises the possibility of a much warmer lunar mantle than previously believed, at least on the near side where the deep crust is substantially warmer because of the greater concentration of radioactive elements.[76][77][78][79] Just prior to this, evidence has been presented for 2–10 million years younger basaltic volcanism inside Lowell crater,[80][81] Orientale basin, located in the transition zone between the near and far sides of the Moon. An initially hotter mantle and/or local enrichment of heat-producing elements in the mantle could be responsible for prolonged activities also on the far side in the Orientale basin.

The other major geologic process that has affected the Moon's surface is impact cratering,[87] with craters formed when asteroids and comets collide with the lunar surface. There are estimated to be roughly 300,000 craters wider than 1 km (0.6 mi) on the Moon's near side alone.[88] The lunar geologic timescale is based on the most prominent impact events, including Nectaris, Imbrium, and Orientale, structures characterized by multiple rings of uplifted material, between hundreds and thousands of kilometers in diameter and associated with a broad apron of ejecta deposits that form a regional stratigraphic horizon.[89] The lack of an atmosphere, weather and recent geological processes mean that many of these craters are well-preserved. Although only a few multi-ring basins have been definitively dated, they are useful for assigning relative ages. Because impact craters accumulate at a nearly constant rate, counting the number of craters per unit area can be used to estimate the age of the surface.[89] The radiometric ages of impact-melted rocks collected during the Apollo missions cluster between 3.8 and 4.1 billion years old: this has been used to propose a Late Heavy Bombardment of impacts.[90]

Blanketed on top of the Moon's crust is a highly comminuted (broken into ever smaller particles) and impact gardened surface layer called regolith, formed by impact processes. The finer regolith, the lunar soil of silicon dioxide glass, has a texture resembling snow and a scent resembling spent gunpowder.[91] The regolith of older surfaces is generally thicker than for younger surfaces: it varies in thickness from 10–20 km (6.2–12.4 mi) in the highlands and 3–5 km (1.9–3.1 mi) in the maria.[92] Beneath the finely comminuted regolith layer is the megaregolith, a layer of highly fractured bedrock many kilometers thick.[93]

Comparison of high-resolution images obtained by the Lunar Reconnaissance Orbiter has shown a contemporary crater-production rate significantly higher than previously estimated. A secondary cratering process caused by distal ejecta is thought to churn the top two centimeters of regolith a hundred times more quickly than previous models suggested – on a timescale of 81,000 years

Liquid water cannot persist on the lunar surface. When exposed to solar radiation, water quickly decomposes through a process known as photodissociation and is lost to space. However, since the 1960s, scientists have hypothesized that water ice may be deposited by impacting comets or possibly produced by the reaction of oxygen-rich lunar rocks, and hydrogen from solar wind, leaving traces of water which could possibly persist in cold, permanently shadowed craters at either pole on the Moon.[96][97] Computer simulations suggest that up to 14,000 km2 (5,400 sq mi) of the surface may be in permanent shadow.[98] The presence of usable quantities of water on the Moon is an important factor in rendering lunar habitation as a cost-effective plan; the alternative of transporting water from Earth would be prohibitively expensive.[99]

In years since, signatures of water have been found to exist on the lunar surface.[100] In 1994, the bistatic radar experiment located on the Clementine spacecraft, indicated the existence of small, frozen pockets of water close to the surface. However, later radar observations by Arecibo, suggest these findings may rather be rocks ejected from young impact craters.[101] In 1998, the neutron spectrometer on the Lunar Prospector spacecraft showed that high concentrations of hydrogen are present in the first meter of depth in the regolith near the polar regions.[102] Volcanic lava beads, brought back to Earth aboard Apollo 15, showed small amounts of water in their interior.[103]

The 2008 Chandrayaan-1 spacecraft has since confirmed the existence of surface water ice, using the on-board Moon Mineralogy Mapper. The spectrometer observed absorption lines common to hydroxyl, in reflected sunlight, providing evidence of large quantities of water ice, on the lunar surface. The spacecraft showed that concentrations may possibly be as high as 1,000 ppm.[104] Using the mapper's reflectance spectra, indirect lighting of areas in shadow confirmed water ice within 20° latitude of both poles in 2018.[105] In 2009, LCROSS sent a 2,300 kg (5,100 lb) impactor into a permanently shadowed polar crater, and detected at least 100 kg (220 lb) of water in a plume of ejected material.[106][107] Another examination of the LCROSS data showed the amount of detected water to be closer to 155 ± 12 kg (342 ± 26 lb).

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In May 2011, 615–1410 ppm water in melt inclusions in lunar sample 74220 was reported,[109] the famous high-titanium "orange glass soil" of volcanic origin collected during the Apollo 17 mission in 1972. The inclusions were formed during explosive eruptions on the Moon approximately 3.7 billion years ago. This concentration is comparable with that of magma in Earth's upper mantle. Although of considerable selenological interest, this announcement affords little comfort to would-be lunar colonists – the sample originated many kilometers below the surface, and the inclusions are so difficult to access that it took 39 years to find them with a state-of-the-art ion microprobe instrument.

Analysis of the findings of the Moon Mineralogy Mapper (M3) revealed in August 2018 for the first time "definitive evidence" for water-ice on the lunar surface.[110][111] The data revealed the distinct reflective signatures of water-ice, as opposed to dust and other reflective substances.[112] The ice deposits were found on the North and South poles, although it is more abundant in the South, where water is trapped in permanently shadowed craters and crevices, allowing it to persist as ice on the surface since they are shielded from the sun.

The gravitational field of the Moon has been measured through tracking the Doppler shift of radio signals emitted by orbiting spacecraft. The main lunar gravity features are mascons, large positive gravitational anomalies associated with some of the giant impact basins, partly caused by the dense mare basaltic lava flows that fill those basins.[113][114] The anomalies greatly influence the orbit of spacecraft about the Moon. There are some puzzles: lava flows by themselves cannot explain all of the gravitational signature, and some mascons exist that are not linked to mare volcanism.

The Moon has an external magnetic field of about 1–100 nanoteslas, less than one-hundredth that of Earth. The Moon does not currently have a global dipolar magnetic field and only has crustal magnetization likely acquired early in its history when a dynamo was still operating.[116][117] Theoretically, some of the remnant magnetization may originate from transient magnetic fields generated during large impacts through the expansion of plasma clouds. These clouds are generated during large impacts in an ambient magnetic field. This is supported by the location of the largest crustal magnetizations situated near the antipodes of the giant impact basins.

The Moon has an atmosphere so tenuous as to be nearly vacuum, with a total mass of less than 10 tonnes (9.8 long tons; 11 short tons).[121] The surface pressure of this small mass is around 3×10^{-15} atm (0.3 nPa); it varies with the lunar day. Its sources include outgassing and sputtering, a product of the bombardment of lunar soil by solar wind ions.[12][122] Elements that have been detected include sodium and potassium, produced by sputtering (also found in the atmospheres of Mercury and Io); helium-4 and neon[123] from the solar wind; and argon-40, radon-222, and polonium-210, outgassed after their creation by radioactive decay within the crust and mantle.[124][125] The absence of such neutral species (atoms or molecules) as oxygen, nitrogen, carbon, hydrogen and magnesium, which are present in the regolith, is not understood.[124] Water vapor has been detected by Chandrayaan-1 and found to vary with latitude, with a maximum at ~60–70 degrees; it is possibly generated from the sublimation of water ice in the regolith.[126] These gases either return into the regolith because of the Moon's gravity or are lost to space, either through solar radiation pressure or, if they are ionized, by being swept away by the solar wind's magnetic field

In October 2017, NASA scientists at the Marshall Space Flight Center and the Lunar and Planetary Institute in Houston announced their finding, based on studies of Moon magma samples retrieved by the Apollo missions, that the Moon had once possessed a relatively thick atmosphere for a period of 70 million years between 3 and 4 billion years ago. This atmosphere, sourced from gases ejected from lunar volcanic eruptions, was twice the thickness of that of present-day Mars. The ancient lunar atmosphere was eventually stripped away by solar winds and dissipated into space.

The Moon's axial tilt with respect to the ecliptic is only 1.5424°,[130] much less than the 23.44° of Earth. Because of this, the Moon's solar illumination varies much less with season, and topographical details play a crucial role in seasonal effects.[131] From images taken by Clementine in 1994, it appears that four mountainous regions on the rim of Peary Crater at the Moon's north pole may remain illuminated for the entire lunar day, creating peaks of eternal light. No such regions exist at the south pole. Similarly, there are places that remain in permanent shadow at the bottoms of many polar craters,[98] and these "craters of eternal darkness" are extremely cold: Lunar Reconnaissance Orbiter measured the lowest summer temperatures in craters at the southern pole at 35 K (−238 °C; −397 °F)[132] and just 26 K (−247 °C; −413 °F) close to the winter solstice in north polar Hermite Crater. This is the coldest temperature in the Solar System ever measured by a spacecraft, colder even than the surface of Pluto.[131] Average temperatures of the Moon's surface are reported, but temperatures of different areas will vary greatly depending upon whether they are in sunlight or shadow.

The Moon makes a complete orbit around Earth with respect to the fixed stars about once every 27.3 days[g] (its sidereal period). However, because Earth is moving in its orbit around the Sun at the same time, it takes slightly longer for the Moon to show the same phase to Earth, which is about 29.5 days[h] (its synodic period).[69] Unlike most satellites of other planets, the Moon orbits closer to the ecliptic plane than to the planet's equatorial plane. The Moon's orbit is subtly perturbed by the Sun and Earth in many small, complex and interacting ways. For example, the plane of the Moon's orbit gradually rotates once every 18.61[134] years, which affects other aspects of lunar motion. These follow-on effects are mathematically described by Cassini's laws

Although Luna landers scattered pennants of the Soviet Union on the Moon, and U.S. flags were symbolically planted at their landing sites by the Apollo astronauts, no nation claims ownership of any part of the Moon's surface.[243] Russia, China, and the U.S. are party to the 1967 Outer Space Treaty,[244] which defines the Moon and all outer space as the "province of all mankind".[243] This treaty also restricts the use of the Moon to peaceful purposes, explicitly banning military installations and weapons of mass destruction.[245] The 1979 Moon Agreement was created to restrict the exploitation of the Moon's resources by any single nation, but as of November 2016, it has been signed and ratified by only 18 nations, none of which engages in self-launched human space exploration or has plans to do so.[246] Although several individuals have made claims to the Moon in whole or in part, none of these are considered credible.

The Moon is exceptionally large relative to Earth: Its diameter is more than a quarter and its mass is 1/81 of Earth's.[69] It is the largest moon in the Solar System relative to the size of its planet,[i] though Charon is larger relative to the dwarf planet Pluto, at 1/9 Pluto's mass.[j][136] The Earth and the Moon's barycentre, their common center of mass, is located 1,700 km (1,100 mi) (about a quarter of Earth's radius) beneath Earth's surface.

The Earth revolves around the Earth-Moon barycentre once a sidereal month, with 1/81 the speed of the Moon, or about 12.5 metres (41 ft) per second. This motion is superimposed on the much larger revolution of the Earth around the Sun at a speed of about 30 kilometres (19 mi) per second.

The surface area of the Moon is slightly less than the areas of North and South America combined.

https://en.wikipedia.org/wiki/Moon

The independent country is not only a self-governed nation with its own authorities, but this status needs the international diplomatic recognition of sovereignty.

Thereby, we can say that the total number of independent states in the world today is 197, including 193 fully recognized members of the United Nations and 2 countries, Vatican City and Palestine, have the status of permanent observers in the UN. The other 2 states we include in the list are Kosovo (recognized by 102 UN members) and Taiwan (recognized by 17 countries).

The moon should be divided equally among all of the member nations of the Earth. Here is how this could be done and how that could balance world debt.

Countries of the World

193 UN MEMBER STATES

Afghanistan
Albania
Algeria
Andorra
Angola
Antigua and Barbuda
Argentina
Armenia
Australia
Austria
Azerbaijan
Bahamas
Bahrain
Bangladesh
Barbados
Belarus
Belgium
Belize
Benin
Bhutan
Bolivia
Bosnia and Herzegovina
Botswana
Brazil
Brunei Darussalam
Bulgaria
Burkina Faso
Burundi
Cambodia
Cameroon
Canada
Cape Verde
Central African Republic
Chad
Chile
China
Colombia
Comoros
Congo (Republic of the)
Costa Rica
Côte d'Ivoire
Croatia
Cuba
Cyprus
Czech Republic
Democratic People's Republic of Korea
Democratic Republic of the Congo
Denmark
Djibouti
Dominica
Dominican Republic
Ecuador
Egypt
El Salvador
Equatorial Guinea
Eritrea
Estonia
Ethiopia
Fiji
Finland
France
Gabon
Gambia
Georgia
Germany
Ghana
Greece
Grenada
Guatemala
Guinea
Guinea-Bissau
Guyana
Haiti
Honduras
Hungary
Iceland
India
Indonesia
Iran
Iraq
Ireland
Israel
Italy
Jamaica
Japan
Jordan
Kazakhstan
Kenya
Kiribati
Kuwait
Kyrgyzstan
Lao People's Democratic Republic
Latvia
Lebanon
Lesotho
Liberia
Libya
Liechtenstein
Lithuania
Luxembourg
Madagascar
Malawi
Malaysia
Maldives
Mali
Malta
Marshall Islands
Mauritania
Mauritius
Mexico
Micronesia (Federated States of)
Monaco
Mongolia
Montenegro
Morocco
Mozambique
Myanmar
Namibia
Nauru
Nepal
Netherlands
New Zealand
Nicaragua
Niger
Nigeria
Norway
Oman
Pakistan
Palau
Panama
Papua New Guinea
Paraguay
Peru
Philippines
Poland
Portugal
Qatar
Republic of Korea
Republic of Moldova
Romania
Russian Federation
Rwanda
Saint Kitts and Nevis
Saint Lucia
Saint Vincent and the Grenadines
Samoa
San Marino
Sao Tome and Principe
Saudi Arabia
Senegal
Serbia
Seychelles
Sierra Leone
Singapore
Slovakia
Slovenia
Solomon Islands
Somalia
South Africa
South Sudan
Spain
Sri Lanka
Sudan
Suriname
Swaziland
Switzerland
Sweden
Syria
Tajikistan
Thailand
The former Yugoslav Republic of Macedonia
Timor Leste
Togo
Tonga
Trinidad and Tobago
Tunisia
Turkey
Turkmenistan
Tuvalu
Uganda
Ukraine
United Arab Emirates
United Kingdom
United of Republic of Tanzania
United States
Uruguay
Uzbekistan
Vanuatu
Venezuela
Vietnam
Yemen
Zambia
Zimbabwe

2 OBSEVER STATES

Holy See
State of Palestine

11 OTHER STATES

Abkhazia
Cook Islands
Kosovo"– Republic of Kosovo
Nagorno-Karabakh Republic
Niue
Sahrawi Arab Democratic Republic
Somaliland"– Republic of Somaliland South
Ossetia"– Republic of South Ossetia
Taiwan"– Republic of China Pridnestrovian
Moldavian Republic Turkish Republic of
Northern Cyprus

The moon's surface area is about 14.6 million square miles (38 million square kilometers), which is less than the total surface area of the continent of Asia (17.2 million square miles or 44.5 million square km). Mass, density and gravity The moon's mass is 7.35 x 10 22 kg, about 1.2 percent of Earth's mass.

14,600,000 / 197 = 74,111.675

That is 74,111 square miles of real estate to speculate on for each nation.

To make this division more equitable,
the more populous nations should
be allotted the light side of the Moon
and the less populous nations be
allotted the dark side of the Moon. In
The far future the dark side of the Moon
could become valuable for industry because
of the ultra cold environment.

This new land would give nations collateral To borrow against as well as allow current national debts to be paid in real estate. This would require a special banking institution so the nations would be able to buy the land back regardless of the debtors wishes, until it is developed. I propose this bank be called "Judas Bank."