Overview of the Council: Future Council

The United Nations Educational, Scientific, and Cultural Organization (UNESCO) was established in 1945. UNESCO has members from the General Conference and UNESCO has its programme and budget set by the General Assembly. UNESCO is also under the management of The Executive Board. Membership of UNESCO is governed by Articles II and XV of the Constitution and by rules 98 to 101 of the Rules of Procedure of the General Conference. There are 195 members and 9 associate members. The Secretariat consists of the Director-General and the Staff appointed by him or her. The executive branch of UNESCO employed 2,000 civil employees across 170 countries and there are 65 UNESCO field offices around the world.

The goal of UNESCO is very holistic and influential prevalently across the world. UNESCO strives to mobilize for education so that children for all ages have access to the finest education to be offered to lesser developed countries across the world, building intercultural understanding, pursue scientific cooperation, to strengthen ties between nations and societies, and protect freedom of expression, which is an essential condition for democracy, development, and human dignity. UNESCO focuses on global issues such as water sanitation and effective water allocation for the better condition of Earth in both Lesser Developed Countries (LDC) and affected countries in the future.

The Committee on the Peaceful Uses of Outer Space (COPUOS) under the United Nations Office for Outer Space Affairs (UNOOSA) was established in 1959 under resolution 1472 (XIV). COPUOS has 77 member states and two standing subcommittees: the Scientific and Technical Subcommittee and the Legal Subcommittee. The Committee and its two Subcommittees meet annually to consider questions put before them by the General Assembly, reports submitted to them and issues raised by the Member States. The Committee and the Subcommittees, working on the basis of consensus, make recommendations to the General Assembly. Detailed information on the work of the Committee and the Subcommittees are contained in their annual reports. The most recent session, the fifty-seventh session, of the Committee on the Peaceful Uses of Outer Space was held from June 11-20, 2014 at the United Nation Office at Vienna, Vienna International Center, Vienna, Austria.

The main purpose of COPUOS is to review the scope of international cooperation in peaceful uses of outer space, to devise programs in this field to be undertaken under United Nations support, to promote and encourage the ignition of further research in potential cooperation of effective outer space uses, and cooperate with the member states for promotion of many more projects including new branches of topics.

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http://en.unesco.org/about-us/introducing-unesco

Topic 1: Water Allocation

Equitable sharing of water resources is a complex issue that has only become more so in recent years due to population growth, development pressures, and changing needs and values. The unequal distribution of water is heightened by political changes, resource mismanagement, and climatic anomalies. These factors can trigger massive upheavals as well as demographic and developmental transformations, all of which, in turn, contribute to significant socio-economic differentiations.

Growing competition between different sectors has placed increasing strain on the quality and quantity of freshwater supplies. Competition for water also manifests in the demands for different uses – urban versus rural, quantity versus quality, present use versus future demand, and sanitation versus other social priorities. Competition among uses and users has increased in almost all countries, as have the links connecting them, calling for more effective negotiation and allocation mechanisms.

Implementation must address wise planning for water resources, availability and needs in watersheds, relocation or storage expansion in existing reservoirs, increased emphasis on water demand management, and improved balance between equity and efficiency of use—all the while accounting for inadequate legislative and institutional frameworks coupled with the rising financial burden of aging infrastructures.

Water-allocation policies vary from one country to another. Each country has adopted its own mechanisms according to its natural conditions, social and economic structure, and political situation, and these policies should be evaluated for their environmental, economic and socio-political effects. Cost-benefit analysis is the most common method for evaluating different alternatives for a project, and it can be used as a decision-support device to suggest what water-allocation pattern is likely to provide the highest net social benefit to society as a whole. Cost-benefit analysis is undertaken for Egypt and Jordan in this study, and results suggest that the net benefit to society could be greatly improved by reallocating water away from agriculture to other sectors of the economy.

Global trends in water use during the twentieth century show that water consumption has increased almost tenfold. At present, around 35 per cent of the world's available water supplies are in use, compared with less than 5 per cent at the turn of the twentieth century. However, water scarcity is reaching alarming levels in some areas, especially arid and semi-arid regions, and this increasing scarcity has highlighted various water-related problems, such as conflicts between different uses and users. Conflict between the demands of the three major sectors (agricultural, domestic and industrial) is becoming fierce, but other sectors (such as energy, environment, flood control, navigation, fisheries and recreation) are increasingly affected as well. These conflicting demands are the result not only of a shortage of water, but also of society's inability to develop equitable allocation of water between different uses and users. However, there are positive developments: there is a growing awareness of the problem, and conscious efforts are being made to develop sustainable and favourable trade-offs.

In many parts of the world, the 1990s witnessed a dramatic shift in priorities for water-resource allocation and development. Irrigation, which was once seen as an essential step towards the achievement of self-sufficiency in food production, is now seen as a low-value use for water, when compared with municipal, industrial or even environmental uses. Not only are fewer funds being allocated for irrigation project development, but in an increasing number of cases, water is being transferred away from agriculture to meet growing demands in other areas. Sometimes the farmers holding water rights in these cases are compensated; on other occasions, they do not need to be compensated, nor does their consent need to be sought. The following should serve as an example: 15,000 cubic metres of water are necessary to irrigate 1 hectare of rice, but the same amount of water can supply 100 nomads and 450 heads of livestock for 3 years; or 100 rural families with piped water for 4 years; or 100 urban families for 2 years; or 100 luxury hotels for 55 days, etc. Industry requires large amounts of water, but about 85 per cent of it is returned to the water system, albeit heavily polluted with various waste materials, including chemicals and heavy metals. Demand for water from the domestic sector is moderate in comparison with that from the agricultural and industrial sectors, but its quality requirement is much higher (Richards 2001, Saleth and Dinar 1999).

Facts and figures extracted from WWDR3, Water in a Changing World (2009).

- Demographics and consumption are the main pressure on water
- Agriculture is the largest consumer of freshwater
- Water scarcity may limit food production and supply, putting pressure on food prices
- About 80% of global virtual water flows relate to agricultural products trade
- Energy for cooling accounts for 1-2% of water demand
- According to IEA, the world will need almost 60% more energy in 2030 than in 2020
- Hydropower supplies about 20% of the world's electricity
- Renewable energy resources alone are not sufficient to meet the predicted dramatic increase in energy demands through 2030
- Irrigation water allocated to biofuel production is estimated at 2%
- It takes an average of roughly 2,500 litres of water to produce 1 litre of liquid biofuel

- Water use for industry and energy is growing coincident with rapid development, transforming the patterns of water use in emerging market economies
- Around the Mediterranean Sea seasonal water demands from the tourism industry increase annual water demand by an estimated 5%-20%
- Water appears to provide reasons for transboundary cooperation

Areas of physical and economic water scarcity

Source: IWMI report, Insights from the Comprehensive Assessment of Water Management in Agriculture, 2006 / p8

Aims of the Council:

The members of the council will be expected to come to a conclusion on water allocation. Delegates are expected to come to an understanding of this issue and take into account the various factors that come into play economically, politically, as well as socially.

The council should be able to:

- Successfully gain an understanding the following issue
- Take into account the economic factors of water allocation
- Understand the implications of redistributing water
- Gain a sense of a worldly thinking for which nations suffer diminishing water sources

- Determine to what extent water allocation is a pressing issue
- Come to a conclusion of how water allocation will be implemented
- Decide on which countries will be involved
- Consider which nations will be affected either positively or negatively when a conclusion is reached

Sources:

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http://www.un.org/waterforlifedecade/pdf/2003_unescwa_sectoral_water_allocation_policies_eng.pdf

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Topic 2: Colonization of Mars

History of the Issue:

Space exploration, especially the topic of the colonization of Mars have been ideas which have picked up much heat recently. Many missions have been launched to try and figure out the composition of Mars, and whether or not human occupation is plausible. The issue does not simply end at whether or not the colonization of Mars is a plausible idea, but expands to how we distribute area to different countries and how we raise the awareness for the colonization of the planet.

One main committee that can be utilized is the Committee on the Peaceful Uses of Outer Space (COPUOS). COPUOS has two subcommittees within itself: the Scientific and Technical Subcommittee and the Legal Subcommittee. As we attempt to expand our colonization extents to Mars.

Conditions for human habitation

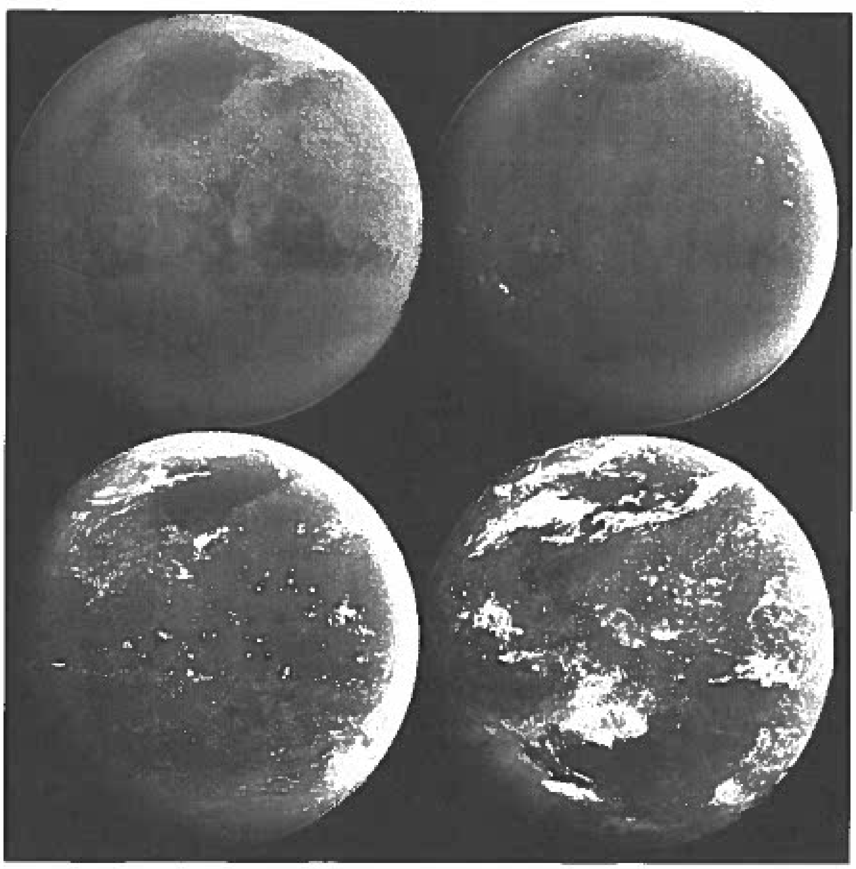
Conditions on the surface of Mars are closer to the conditions on Earth in terms of temperature, atmospheric pressure than on any other planet or moon, except for the cloud tops of Venus. However, the surface is not hospitable to humans or most known life forms due to greatly reduced air pressure, an atmosphere with only 0.1% oxygen, and the lack of liquid water (although large amounts of frozen water have been detected).

In 2012, it was reported that some lichen and cyanobacteria survived and showed remarkable adaptation capacity for photosynthesis after 34 days in simulated Martian conditions in the Mars Simulation Laboratory (MSL) maintained by the German Aerospace Center (DLR).

Humans have explored parts of Earth that match some conditions on Mars. Based on NASA rover data, temperatures on Mars (at low latitudes) are similar to those in Antarctica. The atmospheric pressure at the highest altitudes reached by manned balloon ascents (35 km (114,000 feet) in 1961, 38 km in 2012) is similar to that on the surface of Mars.

Human survival on Mars would require complex life-support measures and living in artificial environments.

Terraforming

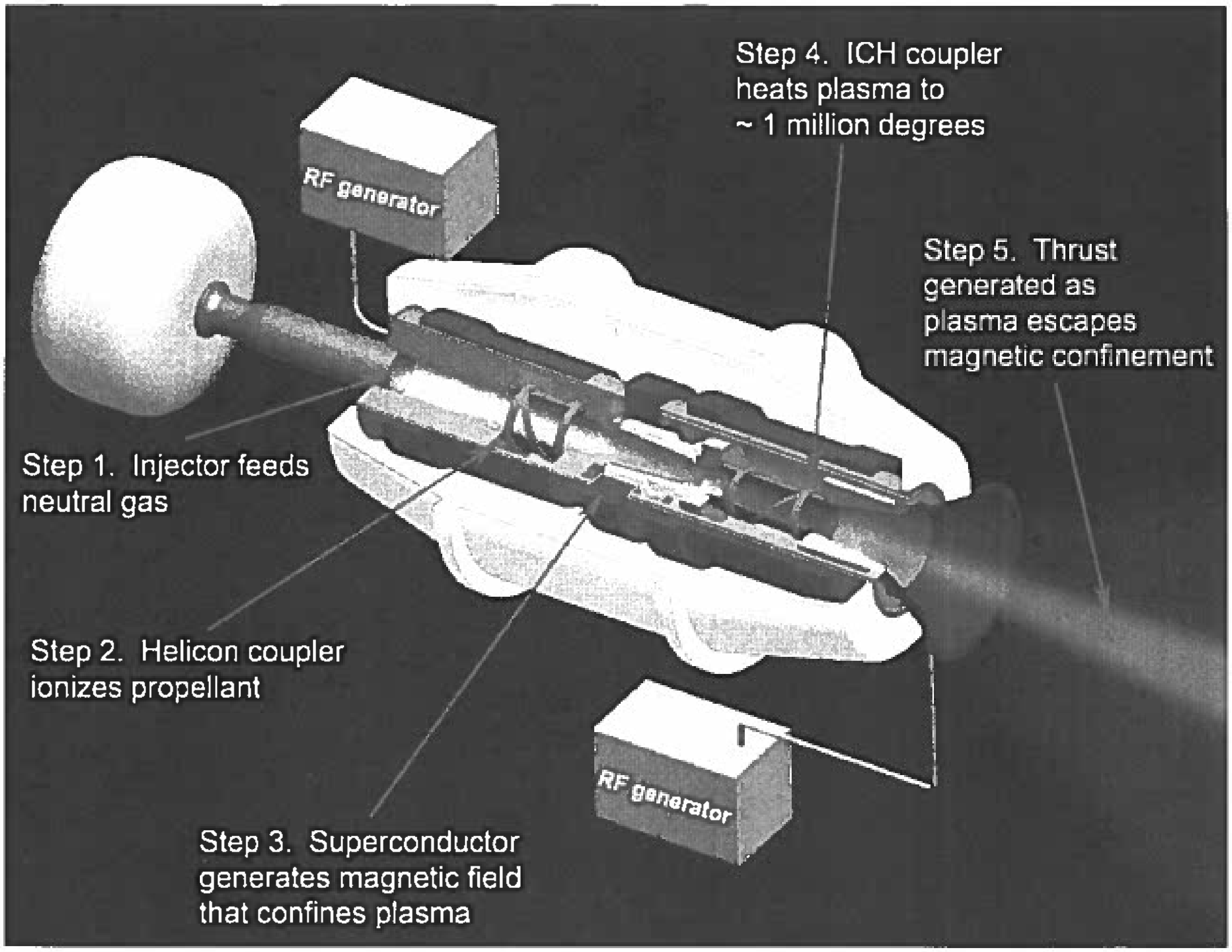


There is much discussion regarding the possibility of terraforming Mars to allow a wide variety of life forms, including humans, to survive unaided on Mars's surface, including the technologies needed to do so.

Transportation

Interplanetary spaceflight

Mars requires less energy per unit mass (delta V) to reach from Earth than any planet except Venus. Using a Hohmann transfer orbit, a trip to Mars requires approximately nine months in space. Modified transfer trajectories that cut the travel time down to seven or six months in space are possible with incrementally higher amounts of energy and fuel compared to a Hohmann transfer orbit, and are in standard use for robotic Mars missions. Shortening the travel time below about six months requires higher delta-v and an exponentially increasing amount of fuel, and is not feasible with chemical rockets, but might be feasible with advanced spacecraft propulsion technologies, some of which have already been tested, such as VASIMR, and nuclear rockets. In the former case, a trip time of forty days could be attainable, and in the latter, a trip time down to about two weeks.



(Model of VASMIR)

During the journey the astronauts are subject to radiation, which requires a means to protect them. Cosmic radiation and solar wind cause DNA damage, which increases the risk of cancer significantly. The effect of long term travel in interplanetary space is unknown, but scientists estimate an *added* risk of between 1% and 19%, most likely 3.4%, for men to die of cancer because of the radiation during the journey to Mars and back to Earth. For women the probability is higher due to their larger glandular tissues.

Equipment needed for colonization

Colonization of Mars will require a wide variety of equipment—both equipment to directly provide services to humans and production equipment used to produce food, propellant, water, energy and breathable oxygen—in order to support human colonization efforts. Required equipment will include:

- habitats
- storage facilities
- shop workspaces

- resource extraction equipment—initially for water and oxygen, later for a wider cross section of minerals, building materials, etc.
- energy production and storage equipment, some solar and perhaps other forms as well
- food production spaces and equipment
- propellant production equipment, generally thought to be hydrogen and methane[35] for fuel—with oxygen oxidizer—for chemical rocket engines
- fuels or other energy source for use with surface transportation. Carbon monoxide/oxygen (CO/O_2) engines have been suggested for early surface transportation use as both carbon monoxide and oxygen can be straightforwardly produced by zirconia electrolysis from the Martian atmosphere without requiring use of any of the Martian water resources to obtain hydrogen.[36]
- communication equipment

Communication

Communications with Earth are relatively straightforward during the half-sol when Earth is above the Martian horizon. NASA and ESA included communications relay equipment in several of the Mars orbiters, so Mars already has communications satellites. While these will eventually wear out, additional orbiters with communication relay capability are likely to be launched before any colonization expeditions are mounted.

The one-way communication delay due to the speed of light ranges from about 3 minutes at closest approach (approximated by perihelion of Mars minus aphelion of Earth) to 22 minutes at the largest possible superior conjunction (approximated by aphelion of Mars plus aphelion of Earth). Real-time communication, such as telephone conversations or Internet Relay Chat, between Earth and Mars would be highly impractical due to the long time lags involved. NASA has found that direct communication can be blocked for about two weeks every synodic period, around the time of superior conjunction when the Sun is directly between Mars and Earth,[37] although the actual duration of the communications blackout varies from mission to mission depending on various factors—such as the amount of link margin designed into the communications system, and the minimum data rate that is acceptable from a mission standpoint. In reality most missions at Mars have had communications blackout periods of the order of a month.

A satellite at the L_4 or L_5 Earth–Sun Lagrangian point could serve as a relay during this period to solve the problem; even a constellation of communications satellites would be a minor expense in the context of a full colonization program. However, the size and power of the equipment needed for these distances make the L4 and L5 locations unrealistic for relay stations, and the inherent stability of these regions, although beneficial in terms of station-keeping, also attracts dust and asteroids, which could pose a risk. Despite that concern, the STEREO probes passed through the L4 and L5 regions without damage in late 2009.

Recent work by the University of Strathclyde's Advanced Space Concepts Laboratory, in collaboration with the European Space Agency, has suggested an alternative relay architecture based on highly non-Keplerian orbits. These are a special kind of orbit produced when continuous low-thrust propulsion, such as that produced from an ion engine or solar sail, modifies the natural trajectory of a spacecraft. Such an orbit would enable continuous communications during solar conjunction by allowing a relay spacecraft to "hover" above Mars, out of the orbital plane of the two planets. Such a relay avoids the problems of satellites stationed at either L4 or L5 by being significantly closer to the surface of Mars while still maintaining continuous communication between the two planets.

Early human missions

In 1948, Wernher von Braun described in his book *The Mars Project* that a fleet of 10 spaceships could be built using 1000 three-stage rockets. These could bring a population of 70 people to Mars.

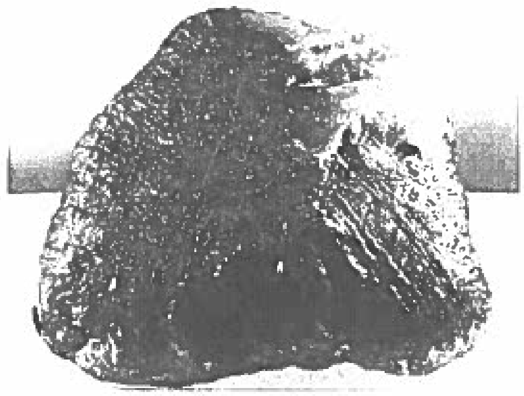
All of the early human missions to Mars as conceived by national governmental space programs—such as those being tentatively planned by NASA, FKA and ESA—would not be direct precursors to colonization. They are intended solely as exploration missions, as the *Apollo* missions to the Moon were not planned to be sites of a permanent base.

Colonization requires the establishment of permanent bases that have potential for self-expansion. A famous proposal for building such bases is the Mars Direct and the Semi-Direct plans, advocated by Robert Zubrin.

Other proposals that envision the creation of a settlement have come from Jim McLane and Bas Lansdorp (the man behind Mars One, which envisions no planned return flight for the humans embarking on the journey), as well as from Elon Musk whose SpaceX company, as of 2015, is funding development work on a space transportation system called the Mars Colonial Transporter.

The Mars Society has established the Mars Analogue Research Station Programme at sites Devon Island in Canada and in Utah, United States, to experiment with different plans for human operations on Mars, based on Mars Direct. Modern Martian architecture concepts often include facilities to produce oxygen and propellant on the surface of the planet.

Economics



As with early colonies in the New World, economics would be a crucial aspect to a colony's success. The reduced gravity well of Mars and its position in the Solar System may facilitate Mars–Earth trade and may provide an economic rationale for continued settlement of the planet. Given its size and resources, this might eventually be a place to grow food and produce equipment that would be used by miners in the asteroid belt.

A major economic problem is the enormous up-front investment required to establish the colony and perhaps also terraform the planet.

Some early Mars colonies might specialize in developing local resources for Martian consumption, such as water and/or ice. Local resources can also be used in infrastructure construction. One source of Martian ore currently known to be available is metallic iron in the form of nickel–iron meteorites. Iron in this form is more easily extracted than from the iron oxides that cover the planet.

Another main inter-Martian trade good during early colonization could be manure. Assuming that life doesn't exist on Mars, the soil is going to be very poor for growing plants, so manure and other fertilizers will be valued highly in any Martian civilization until the planet changes enough chemically to support growing vegetation on its own.

Solar power is a candidate for power for a Martian colony. Solar insolation (the amount of solar radiation that reaches Mars) is about 42% of that on Earth, since Mars is about 52% farther from the Sun and insolation falls off as the square of distance. But the thin atmosphere would allow almost all of that energy to reach the surface as compared to Earth, where the atmosphere absorbs roughly a quarter of the solar radiation. Sunlight on the surface of Mars would be much like a moderately cloudy day on Earth.

Nuclear power is also a good candidate, since the fuel is very dense for cheap transportation from Earth. Nuclear power also produces heat, which would be extremely valuable to a Mars colony.

Mars's reduced gravity together with its rotation rate makes it possible for the construction of a space elevator with today's materials, although the low orbit of Phobos could present engineering challenges. If constructed, the elevator could transport minerals and other natural resources extracted from the planet.

Economic drivers

Space colonization on Mars can roughly be said to be possible when the necessary methods of space colonization become cheap enough (such as space access by cheaper launch systems) to meet the cumulative funds that have been gathered for the purpose.

Although there are no immediate prospects for the large amounts of money required for any space colonization to be available given traditional launch costs, there is some prospect of a radical reduction to launch costs in the 2010s, which would consequently lessen the cost of any efforts in that direction. With a published price of US$56.5 million per launch of up to 13,150 kg (28,990 lb) payload to low Earth orbit, SpaceX Falcon 9 rockets are already the "cheapest in the industry". Advancements currently being developed as part of the SpaceX reusable launch system development program to enable reusable Falcon 9s "could drop the price by an order of magnitude, sparking more space-based enterprise, which in turn would drop the cost of access to space still further through economies of scale." SpaceX' reusable plans include Falcon Heavy and future methane-based launch vehicles including the Mars Colonial Transporter. If SpaceX is successful in developing the reusable technology, it would be expected to "have a major impact on the cost of access to space", and change the increasingly competitive market in space launch services.

Alternative funding approaches might include the creation of inducement prizes. For example, the 2004 President's Commission on Implementation of United States Space Exploration Policy suggested that an inducement prize contest should be established, perhaps by government, for the achievement of space colonization. One example provided was offering a prize to the first organization to place humans on the Moon and sustain them for a fixed period before they return to Earth.

Advocacy

Mars colonization is advocated by several non-governmental groups for a range of reasons and with varied proposals. One of the oldest groups is the Mars Society who promote a NASA program to accomplish human exploration of Mars and have set up Mars analog research stations in Canada and the United States. MarsDrive is dedicated to private initiatives for the exploration and settlement of Mars. Mars to Stay advocates recycling emergency return vehicles into permanent settlements as soon as initial explorers determine permanent habitation is possible. Mars One, which went public in June 2012, aims to establish a fully operational permanent human colony on Mars by 2023 with funding coming from a reality TV show and other commercial exploitation, although this approach has been widely criticized as unrealistic and infeasible.

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