



# War or peace? The possible scenarios of colonising Mars

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## ABSTRACT

The idea of the manned mission to Mars and Mars colonising is getting more reliable and realistic. However, it is not clear if one country could realize such great economic, societal, and technological challenge. Here we show what are possible chances and obstacles for the international collaboration in the future space policy that is focused on launching the manned mission to Mars. We discuss some peculiarities appropriate for peaceful and conflict scenarios of the planned colonisation of Mars.

## 1. Introduction

The history of human species can be written as the history of the discovery of new territories. This is also the history of constant conflicts and wars because exploration often has been made by means of disunity and violence. History of human wars and conflicts is commonly discussed but there are still not too many studies about possible future disagreements in the context of space policy and the possible future international space race. In our paper, we are going to discuss possible scenarios of the future international space policy in the context of one of the current greatest challenges: plans to prepare the manned mission to Mars and then to establishing the first human outer space colony. We discuss possible benefits and reasons for such a mission, the past cases of both conflict and peaceful ways of colonisation, and we consider peculiarities of peaceful and conflict scenarios for the future space race between involved countries. Our key idea assumes that the peaceful collaboration is the best and the most desirable way but there are some possible obstacles that can block such the most beneficial solution. We just discussed other challenges associated with these plans of the manned mission to Mars, like legal and political [30], evolutionary and psychological [27], cultural [28,29] or biological including an opportunity of reproduction on Mars to maintain the human colony in the outer space [31].

## 2. The benefits of Mars exploration

Mars is a planet that is being considered as potentially the best place

for establishing the first human colony in the outer space. We mean, of course, the current technological opportunities and more difficult environmental conditions on other space objects. We should rule out an opportunity of interstellar journeys to achieve exoplanets like these ones detected recently [10]. Consequently, the current unique opportunity is moving only within the borders of the solar system. Among the planets of the solar system, only Mars can be treated as a place for the future manned space mission. Other planets have more unfavorable environments. Venus is at perihelion in a position closer to Earth than Mars (perihelion of Venus is about 40 000 000 km, perihelion of Mars is 55 000 000 km). Nevertheless, it is probably the unique advantage of Venus over Mars. Venus atmosphere generates much higher temperature than it is on Mars (the highest temperature on Venus is 460 grades in comparison to about 30 grades on Mars, and it excludes any opportunity for settlement and maintaining life). Therefore, Mars is the unique planet in the solar system that can be considered as reliable purpose for the manned mission both by technological opportunities like environmental conditions as well. The Moon is less attractive than Mars because of better atmosphere, higher temperature, and subsurface water resources [12].

Chris Impey points out that the journey to Mars and then an opportunity to live there will be a great challenge but also it will cause great difficulties. For this reason, the cost to benefit ratio for this mission should provide more advantages than disadvantages. However, it is no doubt that some threats will be a constant risk that perhaps will be impossible to eliminate, and possible only to reduce. One of the greatest dangers, according to Impey, will be the crew exposing on cosmic

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radiation. Long standing in weightlessness and, then, just on Mars, standing in the state of microgravity. Another challenge will be a long living in very small areas, first in the spacecraft, and then in the base on Mars [12]. We can add such other kinds of exposure to high risk of death of the crew and of the test pilots. However, we should accept some kind of gamble as the inevitable cost for such projects. In this context, it is worth to consider some ethical challenges like the high risk of sacrifice of human life that is definitely non-acceptable in the western ethical and axiological system.

It is no doubt that one of the greatest challenges for humanity on Earth is a necessity to solve the problem of decreasing resources that are needed for industry. It is estimated that many of them will run out in the next fifty years. Mars can be a place that could work as a source for new resources, perhaps more to process them on Mars than for sending them to Earth. However, the final solutions will depend on transport opportunities and their costs. An alternative solution for solving the problem of decreasing resources on Earth can be exploiting asteroids as the sources of metals that are inaccessible or just running out on Earth. We mean the concept of the mining of asteroids [12]. Even if looking for new resources will not be the purpose of Martian colony, it might be an important part of this activity. One of the possible scenarios of this mission can be an opportunity to build the base from resources gained on Mars, for instance, by means of a 3D printer. However, even if we assume that looking for mineral and metal resources on Mars does not provide reasons for this mission, we can suspect that the scientific and technological advances needed for the mining of asteroids could be correlated with working on preparing manned mission to Mars, and it can work as one of the components of research and technological developments that are needed for this mission.

The main benefit that could be provided by colonisation of Mars would be an opportunity to save the life of humanity when it is life on Earth will be endangered. It seems that the greatest possible source of dangers is the humanity itself, but beside it, the another greatest danger is probably the asteroid impact. To provide survival of humanity, the easier and the less costly project, as Impey points out, can be an attempt to reduce threats on Earth, and taking more care for proper conditions for human survival on Earth [12].

If we treat the idea of Mars colonisation as an alternative for an opportunity of survival of humanity, the mentioned running out resources are only one of possible threats for maintaining life on Earth. If we take into account such possible threats, it is worth considering Mars as perhaps the unique solution for further survival of humanity. Among possible threats on Earth we can enumerate such of them like nuclear war, environmental catastrophes, incurable epidemic, asteroid impact, or uncontrolled development of artificial intelligence that could be deleterious for humanity [12]. Of course, the concept of the human outer space colony as a way to solve human life could be applied probably only to some small part of the entire humanity, for instance, for these ones who survived one of the mentioned catastrophes. Consequently, the current work on preparation of the manned mission to Mars can be treated as a work to provide the future further living of the human species whose further existence on Earth in the next several hundred or several thousand years can be really endangered.

Chris Carberry and Joe Webster enumerate some additional reasons for preparing the manned mission to Mars. One of them is a possible great contribution to development of science. This development contains not only direct development of technology and medicine but also will be stimulated by an opportunity for direct human exploration of Mars. It seems that the idea of improving science and knowledge can work as an important reason for preparing such a mission. Thus, the idea of Mars colonisation can be treated as a purpose of development of the world science, especially for developing technologies that can provide safe transport and survival in the outer space. The new knowledge that humanity can get during Mars mission, can provide significant contribution to the field of the evolution of the planets. It can be assumed that this knowledge could improve our knowledge

about the Earth by looking for some parallels between the evolution of Mars and of Earth [7].

Mars is the only cosmic object that can be the subject of such mission. The current technological facilities provide journey only to Moon that has worse parameters in comparison with Mars to establish a human colony. Mars is thus the only place on which it could be possible to establish a new developmental line in the human history.

It seems that it is possible to find among possible benefits the two following questions. One of them is just partially mentioned an inspiration for intensive scientific development. It can be assumed that for the global intensive development of science a useful policy could provide one superior goal that could connect efforts of various scientists from the whole world. Common work on the future manned mission, on establishing human colony, and on all other challenges needed for increasing the level of security and eliminating all possible threats, can provide such goal. It is no doubt that many scientific achievements that will be prepared for the purpose of that mission, can be applied to particular fields of the mundane life. Ones of such fields are medicine and food production. It is very likely that some discoveries in medicine can be applied for medical treatment on Earth. Perhaps something more important are research that are focused on the production of food on Mars. Such solutions could work on Earth to avoid a food deficiency and to enable the food production in regions that are threatened by erosion.

Another question is the human need to explore and the human curiosity. Their result is the need to look for new territories. In the case of historical colonisation expeditions, and expansion of Homo Sapiens from Africa for other continents as well, their goal has not been only getting an access to the new resources and getting only practical benefits. It can be assumed that the need to discover and to achieve the new territories is the fixed human feature. This need is connected with human tendency to improve the current achievements.

### 3. The history of colonisation – a fierce competition between empires

Looking from the perspective of recent centuries, Mars will not be the first colonisation target. In fact, ceaseless competition between global powers, willing to control new areas in North and South America, Africa, Asia, and Oceania, began as early as in the 15th century and frequently transformed into conflicts between the competing parties. The war for new territories spread across both the contested regions and the European continent, with the Seven Years' War (1756–1763) being one of the first examples [2]. Conflicts between colonists also arose in Central Asia. For instance, in 1884 and 1885 it seemed very likely that the United Kingdom and Russia would go to war for the disputable land in Afghanistan which, according to London's geopolitical thought, was considered a buffer country, protecting India against the potential Russian expansion from the north. The dispute eventually ended with an agreement reached in September 1885 between Robert Salisbury's government and the Russian party [22]; pp. 41–42. In 1877–1878 Russia went to war with Turkey to gain control over the Balkans. Once defeated, Turkey had to agree to establish the Kingdom of Bulgaria, annexing Dobruja to Romania, and extending the territory of Serbia and Montenegro. From 1904 to 1905 fierce fights progressed between Japan and Russia, both intending to gain influence over Korea and China. In the western hemisphere, the intensifying expansionist trends in the United States caused a conflict with Spain for Cuba and the Philippines. The truce reached in 1898 forced Madrid to resign from Cuba, Puerto Rico and the Philippines [22]; pp. 87–88. Disputes in Africa were no less important. In 1898 a small French troop, consisting of 100 soldiers led by Captain Jean-Baptiste Marchand, entered the southern region of Sudan, which was back then controlled by the British. London saw this excursion as a threat to the route connecting the British land, spreading from Egypt to South Africa. The French troop soon met with the corps commanded by General Kitchener

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