- The name of the project prompt to the popular British band – 30 second to Mars
- All footnotes are provided by the author

„30 years to Mars…" by Ada Eichert

It is claimed that the first observations of Mars were held by the ancient Egyptian astronomers and before 1534 BC its retrograde motion[1], then Aristotle and Ptolemus also tried to discover the secrets of this planet in this particular case – the orbit. The truth is that when a man got to know that there are billions of planets and stars in space, millions of new questions were posed and with the advance of the technology this numbers are just getting bigger.

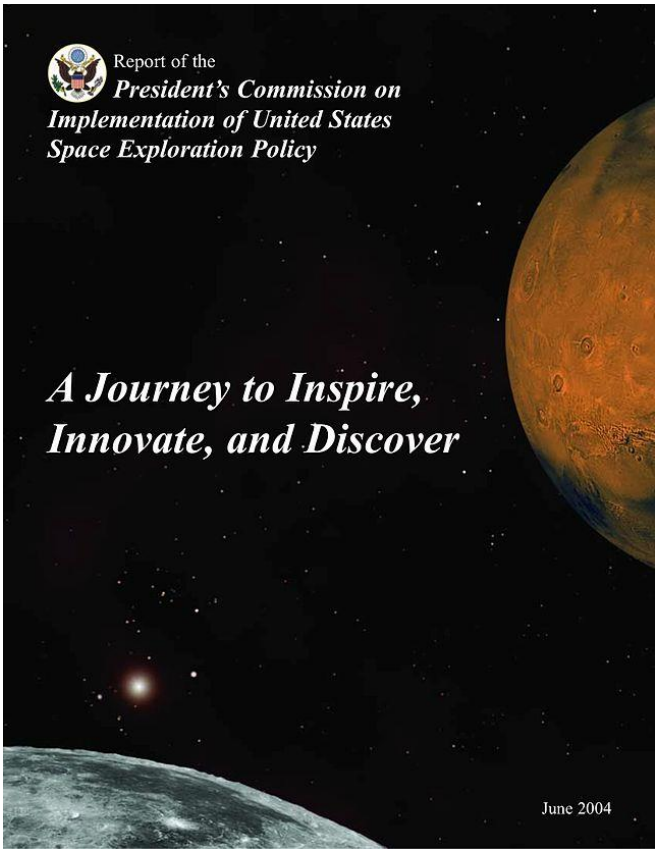
Another factor pushing the humanity towards the other planets is the common economic problem of scarcity of resources. Till 2050 it is expected that the usage of energy will grow from 13 500 GW to 50 00 GW. This means the growth in the extraction of fossil fuels. The optimistic predictions are that some of this fossil deposits will be depleted in 400 year time. [2]Others such as coal in 200 years, but even though it seems to be a long time in the geological scale it is just a blink of an eye and in comparison to the 100 000-year-long human history it is similarly.

Oil platform in the Gulf of Mexico at sunset. fot: Larry Lee/Orbis

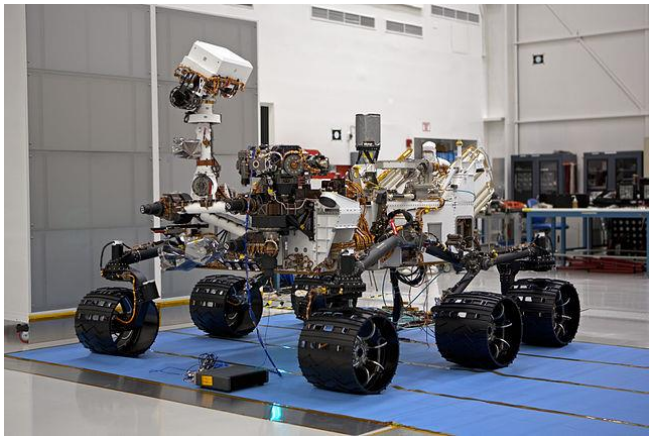
Due to the problems of scarcity, environmental and overpopulation, the researchers are trying to find another places for us to live. Since late 80's the new idea of inhabiting the other planets in the solar system was developed. And among them – especially the Mars.

Even though there were many projects of sending space crafts to this planet through the years such as Soviet mission proposals (1956 through 1970), NASA Space Exploration Initiative (1989), European Space Agency Aurora programme (2001+) etc. the first to send there a man was the USA Vision for Space Exploration in 2004. Proclaimed by the American President George Bush it never came to life, but the first outlines of the plans were made in cooperation with NASA, which suggested launching the expedition not from the Earth but from the Moon.[3]

[1] **Retrograde motion is motion in the direction opposite to the movement of something else and the contrary of direct or prograde motion. This motion can be the orbit of one body about another body or about some other point, or the rotation of a single body about its axis.** -
https://en.wikipedia.org/wiki/Retrograde_and_prograde_motion
[2] http://www.klimatdlaziemi.pl/index.php?id=44&lng=pl
[3] https://en.wikipedia.org/wiki/Human_mission_to_Mars



NASA / Aldridge Commission – http://www.nss.org/resources/library/spacepolicy/2004-AldridgeCommissionReport.pdf



Lounger „Curiosity" – NASA http://photojournal.jpl.nasa.gov/catalog/PIA14309

This policy was then replaced with the new president's one – "Space policy of the Barack Obama administration" announced on April 15, 2010. Among the thesis the government aligned 6 bln $ increase in funding the researches held by NASA to build the high-tech space shuttle that will transfer the people to Mars and will be a base to build a space station there.[4]

The first serious measures taken in this matter was sending the space probe on August 6, 2012 – programme: Mars Science Laboratory, MSL. With lounger called "Curiosity". Its mission lasted 1 Martian year (687 Earth days).[5] It was collecting data concerning the biogenic elements, meteorology, measuring the level of humidity, checking the composition of rocks and soil and what is the most important – examining the future possible abilities of sustaining the organic life on Mars.

The outcome connected with the last issue is a matter of disputes among the best-known scientists.

The President of The Mars Society – Dr. Robert Zubrin[6] published in May 2015 the bulletin arguing with the common statement that the space mission will be harmless (at least to the great extent) for human body, and that the humanity is ready for that step.

Even though he is a head of the non-profit organisation advocating the manned exploration of the Mars, as an expert he also argues with the underestimation of threats posed by the harsh space conditions on the whole mission.

His announcement was the answer to the program launched by the Dutch Astronomical Institute – Project Mars One. Its aim is to send 100 people from around the globe to the Mars, where they will be a first settlers. Transforming the modern space shuttle they will be able to build a form version of the station – the prelude to

[4] https://en.wikipedia.org/wiki/Space_policy_of_the_Barack_Obama_administration
[5] https://en.wikipedia.org/wiki/Human_mission_to_Mars
[6] **American aerospace engineer and author, best known for his advocacy of the manned exploration of Mars. He was the driving force behind Mars Direct—a proposal intended to produce significant reductions in the cost and complexity of such a mission. -** https://en.wikipedia.org/wiki/Robert_Zubrin

the first city established on that planet. The plan is to send a private satellite station in 2020 and then in the periods of 4 years sending another ships with the crew of 4 people each time. First round of application finished in 2013, another two stages left only 100 applicants out of the initial 202 586.[7]

"Who are the Mars 100 Round Three candidates? There are 50 men and 50 women who successfully passed the second round. The candidates come from all around the world, namely 39 from the Americas, 31 from Europe, 16 from Asia, 7 from Africa, and 7 from Oceania."

The number is astonishing especially because it is the "one-way ticket". Also not only this is the problem. The atmosphere on Mars is thin, the temperatures are about 5 (five) celcius degrees in summer to – 87 (minus eighty seven) celcius degrees in winter. Giving the most similar conditions to those on Earth in the solar system. It is an effect of the fact that this planet is situated 1.52 times further from the Sun than Earth is, and only 43% of the energy reach its surface in comparison to our planet.

Also there are the biggest sandstorms in our system. The wind can reach even 300km per hour.

The picture on the left depicts the level of visibility changing with the duration of the sandstorm.[8]

The scientists claim that despite this inconveniences, the conditions aren't hat harsh that it seems so.

This planet has two small moons – Phobos and Deimos. And the solar days lasts about 24 hours and 40 minutes making it even more possible to inhabit.

This popular attitude is the thing that the DR. Zubrin (mentioned above) argues with. "In a paper entitled "What happens to your brain on the way to Mars" published on May 2nd in the open-access journal Science Advances, a group of radiation researchers claimed that their recent work causing memory loss to mice by administering very large doses of galactic cosmic ray (GCR)-like high energy radiation has serious implications for human Mars exploration. According to the authors, similar effects might severely impact astronauts going to the Red Planet, thereby placing the feasibility of such enterprises in serious question."

This fragment is worth mentioning because he is not the only person to have this view. Dr Victoria Bray from the Astronomical Observatory of the University of Arizona also reminds about the radiation being a lot stronger that the one people experience on Earth. She also reminds about the

[7] http://www.mars-one.com/news/press-releases/the-mars-100-mars-one-announces-round-three-astronaut-candidates
[8] https://pl.wikipedia.org/wiki/Mars#/media/File:Mars_dust_opacities_MER-B_Sol_1205_to_1235.jpg

problems with water which can be only found in the deep frozen ice capes,[9] and the force of gravity having only 3,711 m/s²[10]

She states that this more dangerous exposure to the radiation is a real threat of the cancerogenous diseases to the astronauts and can lead to the loss of health or even life.

Other scientists also support that attitude to some extent, but they highlight the other problem. Even if the physicians will find the way to lessen the problem of radiation on Mars, they claim that not the presence on that planet is dangerous, but the 8 months in the spaceship while travelling there. We are guarded from the high-energy particles by the magnetosphere and atmosphere and the astronauts will be stripped from such protection and become highly susceptible for the harmful rays. [11]

The radiation dose from 5 cGy to 30cGy[12] of the high-energy oxygen (16 0)particles or the titanium (71 Ti) are examined to diminish the density and complexity of the basic part of the neurones – the dendrites. Those parts are responsible for the transmition of the energy impulses between the neurons building the whole human nerve system. The biggest quantity of this parts is placed in the human brain. The medical research held with the usage of the brain cells showed that the space travel can not exactly end with the visible results, but with the unseen damage of the travellers' brains.[13]

The farmacologists aim to find a proper solution to that problem, but this researches needs extra funding, a lot of time and trials.

Overall if the predictions are right, scientists have less and less time to find the answers how to tackle with the problems connected with inhabiting the other planets. There are numerous open questions: how long does it take to inhabit the Mars? Will the project Mars One will come to life? Is the radiation a real threat to the travellers?

The answers will be probable appearing with time, but we have to remember that the space still waits with its uncountable secrets to be unveiled…

[9] http://www.polskatimes.pl/artykul/876988,lot-na-marsa-ale-bez-powrotu-poszukiwani-ochotnicy-ktorzy-zasiedla-planete-zdjecia,id,t.html
[10] On Earth is 9,807 m/s².
[11] http://www.kosmonauta.net/2015/05/podroz-na-marsa-droga-do-trwalego-uszkodzenia-struktury-mozgu/
[12] **Centigray - a unit of absorbed radiation dose equal to one hundredth (10–2) of a gray, or 1 rad**. - http://medical-dictionary.thefreedictionary.com/cGy
[13] What happens to your brain on the way to Mars. Science Advances 01 May 2015: Vol. 1 no. 4. DOI: 10.1126/sciadv.1400256