Giancarlo Genta, J Aeronaut Aerospace Eng 2018, Volume 7
DOI: 10.4172/2168-9792-C1-022

4th International Conference and Exhibition on

Satellite & Space Missions

June 18-20, 2018 | Rome, Italy

Giancarlo Genta

Politecnico di torino, Italy

Next Stop Mars: The Why, How and When of Human Missions

The idea that humans could reach Mars is quite old and was advocated by many pioneers of spaceflight. Apart from fictional descriptions, sometimes bypassing completely the problem of how getting there, and of pioneristic work dealing with the general aspect of the problem, the first detailed study of a human Mars mission was done by Wernher von Braun who published in 1949 Das Mars Projekt, a technically sound project, demonstrating that it was possible to reach Mars with a technology predictable for a not too far future. This project, although technologically consistent, didn't take in due account the relevant costs and, as perhaps unavoidably with a first attempt to put the problem in a rational way, was not sustainable. The early first studies were followed by a large number of other ones, some of which directly promoted by space agencies, other performed by independent researchers or private societies, like the Mars Society. Many robotic Mars missions, performed by NASA, ESA and Roscosmos, recently joined by the Indian Space Agency ISRO, have the explicit goal of paving the way for human exploration of the planet. Since a few years ago the common understanding was that human space exploration was the domain of space agencies, possibly cooperating with each other to mount international endeavors like the International Space Station (ISS), while private organizations like the Mars Society could play a role of advocacy groups, performing support tasks and supplying fresh ideas. Recently, however, private companies and no-profit organizations declared their intentions of mounting space exploration expeditions and/or starting space exploitation activities. Among them, SpaceX is developing a low cost transport system specifically intended for planetary (mainly Mars) exploration and issued statements regarding future mars colonization plans. The book which is here presented deals with the problem of human Mars exploration from all viewpoints, from propulsion and astrodynamics to human factors, from the construction of the habitat on the planet to the ground transportation needed to reach the most interesting location, from the importance of other space missions, in particular those aimed to explore the Moon, as stepping stones to Mars, to more futuristic topics like colonization and terraforming. While returning to the Moon is the first step toward the creation of a spacefaring civilization, the human exploration of Mars is without any doubt the logical 'next step'.

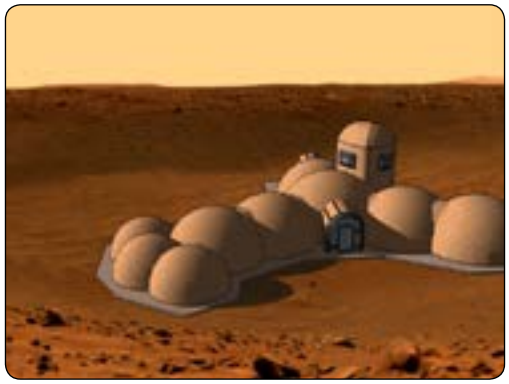

Figure 1: Artist expression of an outpost on Mars built using additive manufacturing technology

Recent Publications

1. G. Genta, Next stop Mars - The Why, How, and When of Human Missions, Springer-Praxis, New York, 2017, ISBN: 978 3 319 44310 2.
2. G. Genta, P. F. Maffione, Optimal Low-Thrust Trajectories for Nuclear and Solar Electric Propulsion, Acta Astronautica, Vol. 118, p. 251-261, 2016.
3. G. Genta, P. F. Maffione, Low Thrust Interplanetary Transfers: Second Approximation Computation of Planetocentric Phases, Advances in Aerospace Science and technology, vol.1, pp 100-107, ISBN 978-7-5159-1282-0, 2017.
4. G. Genta, P. F. Maffione, Comparison Between Different Approaches to Interplanetary Mission Design, International Journal of Signal Processing, Vol. 2, 2017
5. G. Genta, P. F. Maffione, A Graphical Tool to Design Two-Ways Human Mars Missions, Acta Astronautica, to be published.

Biography

Giancarlo Genta is a Professor of Construction Machines at Politecnico (Technical University) di Torino. He is a member of Academy of Sciences of Torino and of International Academy of Astronautics. In 2013, he received the Yangel Medal for outstanding contributions to "The development of the international space sciences and technologies" and the Engineering Science Award of the International Academy of Astronautics for outstanding achievement in Engineering Science. Starting from 2012 he chaired two study groups of the IAA on human Mars and lunar exploration. He authored 95 papers, published in Italian, American and English journals, 276 papers presented to symposia and 26 books. He is also the Author of two science fiction novels, published in Italian, English and Ukrainian.

Giancarlo.genta@polito.it