

34th IAA SYMPOSIUM ON SPACE POLICY, REGULATIONS AND ECONOMICS (E3)
The future of space exploration and innovation (2)

Author: Mr. Adriano V. Autino
Space Renaissance International, Italy, adriano.autino@spacerenaissance.org

Prof. Bernard Foing
ILEWG "EuroMoonMars", The Netherlands, foing@strw.leidenuniv.nl
Mr. Devanshu Jha
Space Generation Advisory Council (SGAC), India, devanshu.jha7@gmail.com
Ms. Susan Ip-Jewell
United States, marsacademyusa@gmail.com

GLOBAL EXPANSION VS. SPACE EXPLORATION, A FULL CHANGE OF PARADIGM

Abstract

Space exploration was done since the first satellite launch – Sputnik, October 4th 1957 – for more than 60 years. A huge investment of public money was devoted to space agencies, however the high frontier was not yet opened to civilian development. Manned space flight is still reserved to astronauts, bearing a hard training. Space programs are still based on the strategy and goals of 1) space exploration and 2) use of space to support Earth. The above two rationales are useful, and not to be abandoned. However humanity is in deep need of a third strategical setup: civilization expansion, and civilian space development. The basic requirements of the stakeholders of such a change of paradigm are briefly reviewed, in order to motivate it upon sound and sustainable social needs. Space tourism is identified as an intermediate step, between space exploration and space settlement. The superiority of a model of global progressive expansion, from Earth orbit, to geo-lunar space region, to Mars, Asteroids Belt and beyond is argued, vs. exploration round-trip missions. A realistic road-map is also sketched, reviewing the evolution of mission requirements, related to human life, health and living conditions, from suborbital tourism, to orbital and cislunar tourism, long distance manned exploration missions, Earth orbit industrial settlements, Lunar and Cislunar industrial settlements, living in orbital space cities. The paper also addresses some enabling technologies, allowing untrained civilians to travel, work and live in space, such as: protection against cosmic radiations, artificial gravity, low cost, safe and comfortable space vehicle, smooth acceleration, safe re-enter into atmosphere, green environment in space habitats. Finally, the paper analyzes the differences between exploration and expansion, in terms of feasibility, sustainability, opportunity and social need.