

From Earth Missions to Deep Space Exploration (05)  
Exploration Capabilities (1)

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AN INNOVATIVE APPROACH FOR DESIGNING AND MANAGING A COMPLEX SPACE  
EXPLORATION MISSION

**Abstract**

A new approach is proposed to design and manage a future human exploration mission based on safety and autonomy. The main goal of this approach is to optimize a mission to Mars, but other destinations like the Moon and the asteroids can also be considered. The “FAcT Mirror” method is applied and contributes to optimize all the human aspects, including the designers, managers and actors of the mission, which must be aggregated and integrated at the early stage of the design. The method originally lies in describing the interpersonal interactions in a complex project by making an inventory of the Fears, Attractions and Temptations (FAcTs) that the participants could feel in relation to one another. With a new common representation of the mission, the actors make recommendations for Human safety and reliability, leading to cooperative actions at different levels. This process encourages creativity and innovation, especially when solutions do not exist in advance, and allows the complexity of the exploration mission to emerge and to be understood by all the actors. Our work, supported by CNES, proposes an innovative approach in the design and management of a complex project based on international contributions from different communities of knowledge and expertise.