

The Human Space Exploration Value Proposition (07)
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MARS: ON THE PATH OR IN THE WAY?

Abstract

The value proposition for human space exploration is broken. Our aerospace community presumes, counterproductively, that government investment in human space flight (HSF) is tantamount to exploration, and therefore justified by the axiomatic goal “Explore Mars.” This goal is axiomatic because, despite continued programmatic upheaval and the absence of widespread consensus regarding HSF strategy, we do not seriously reexamine its fundamental validity. And it is counterproductive because we persist in holding it up as the strategic focus for long-term planning despite the higher opportunity cost of not pursuing alternative goals that are both more likely to succeed and better able to fulfill the potential of humankind becoming a spacefaring species.

The paper traces the history of the “Explore Mars” cultural meme as it has waxed and waned in centrality while political stakeholder agendas have enabled or disabled progress on specific programs. The paper analyzes the unprecedented challenge of contriving and sustaining the necessary investments over the necessary decadal timespan to bring “Explore Mars” to fruition, and clarifies the scenarios resulting in that event as way of assessing the program’s value.

The paper then considers three alternative goals for government HSF investment as outlined in the literature: accelerate growth of a space passenger travel industry; enable industrialization of GEO to produce electrical power for Earth; and settle the Moon. It directly compares their respective value propositions to “Explore Mars” in terms of the activities and investments they would require, the legacy capabilities they would establish, and their capacity to inspire. As measured by public interest, economic benefit, and expansion of human presence beyond LEO, all three of the alternatives are found to be either more pragmatic or attractive, or both, than “Explore Mars” as a strategic focus for HSF.

Since none of these three alternatives has yet taken hold, the paper concludes that “Explore Mars” is conceptually blocking the shaping of an executable, sustainable, multinational HSF future. The paper closes by challenging the HSF community to reexamine our driving assumptions and motivations, to be sure we understand what we seek, can answer explicitly why HSF matters, and are realistic regarding its probability of success.