

IAF BUSINESS INNOVATION SYMPOSIUM (E6)
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CENTURY-SCALE SPACE ENGAGEMENT

Abstract

First announced in 2016, Breakthrough Starshot is currently funding research into the development of proof-of-concept light driven nano-craft with the eventual goal of launching the first mission to the nearest stellar system beyond the heliosphere; Alpha Centauri, located 4.37 light-years from Earth. Using ground-based light-beaming technology, the light-sails of these nano-crafts will be accelerated up to 20% the speed of light, reaching their destination in just over 20 years. Once there, the goal is to explore this system, searching for evidence of life and capturing images of local exoplanets, such as Proxima b, which orbits in the habitable zone of Proxima Centauri. The total estimated cost of this initiative is currently at 10 billion USD (as valued in 2022) with a projected timeline, inclusive of operational mission lifespan, of over 100 years which will require multiple generations of technical contribution and public support.

Century-scale space missions of this scope are going to need the necessary physical infrastructure and cognitive frameworks to be in place to ensure they succeed and thrive over the long-durations involved. This paper identifies and addresses the key elements pertinent to the success of century-scale organizations and their initiatives by 1) studying the architecture of long-lasting organizations, focusing on case-studies of organizations that have had a significant impact on global culture through their continued operations, 2) from this analysis develop a mental framework that will address the organizational challenges faced by the century-scale space missions of the future, and 3) through analysis of space interestedness throughout history and the evolution of mediums of influence, propose actionable and measurable strategies to ensure stakeholder enthusiasm over the full duration of the mission timeline.