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Economics of asteroid mining

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Abstract

Asteroid mining has been drawing increasing interest in the last year with the establishment of two space companies publicly declaring their common intention of mining asteroids. However, the economics of asteroid mining is barely developed, which raises questions on how these companies and future startups will attract enough investment for such a mammoth project. In economics, a net present value that is positive indicates a positive return on a project. No significant additions have been made to Mark Sonter's net present value equation for asteroid mining since he wrote his thesis in 1997. This paper serves to address both the technical and economic factors required to determine a future asteroid mining mission's feasibility. Building upon Sonter's equation, it introduces new variables to cover the gaps and resolves uncertainties in the previous equation.

Biography

Shen Ge received his Masters in aerospace engineering from Texas A&M University in 2011 August and received his undergraduate with a dual major in aerospace engineering and physics with Magna Cum Laude in 2008 December from Georgia Institute of Technology. His background is in space design, space simulations, and experimental design. He has great interest in manned space exploration, near earth asteroids, and space debris. His work on his Masters was on designing an innovative payload for a near earth asteroid mitigation mission. He also has interest in space entrepreneurship and public engagement of space-related endeavors. He is currently actively spearheading the Scientific Preparatory Academy for Cosmic Explorers (SPACE), a nonprofit international undergraduate and graduate space university and research institution.