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THE USE OF ASTEROIDS IN CARGO TRANSPORT FROM EARTH TO MARS USING THE COMET HITCHHIKER CONCEPT

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One of the biggest obstacles to space exploration, in addition to the long distances and technological limitations to reduce them, are the high costs involved for development in this area. We are living at a time when private companies are working on the development of technologies to explore space, and in particular, the Space X, which aims to colonize Mars. The possibility of using asteroids, both to house research equipment and to facilitate space travel, has even been launched by NASA in 2015, where the objective is to develop equipment capable of attaching itself to an asteroid and landing on it to continue its journey. The Jet Propulsion Laboratory/NASA, Scielo and Astrophysics Data System/NASA databases are being used to develop the research that led to this abstract, in order to filter the best candidates for the Earth-Mars route. What we hope with this research is to find an object that is large enough that the landings and weight do not significantly affect its orbit, velocity and rotation. As for the speed, it shouldn't be too fast, however, it is interesting that it completes an orbit in no more than 2 years, aiming to use it for a periodic supply, for example, from a colony on the red planet. Finally, your rotation should not have a spin capable of throwing the equipment off its surface. For the research, we are using the Small Body Database Query interface, including all asteroid classes in the search, and restricting to bodies whose proximity to Earth is up to 0.1 AU (astronomical units), proximity to Jupiter of up to 1 AU, period of up to 600 days, and diameter greater than 300 meters. Preliminary research has pointed to candidates such as 14827 Hypnos (1986 JK), which is almost 1 km in diameter, passes just 0.015 AU from Earth's orbit, and passes equally close to Mars' orbit, but takes around 4 ,7 years to complete an orbit, and has variable speed, which can indicate collisions along the way, in addition to being at high speed (between 10 and 20 km/s). At the end of this research, it is expected as a conclusion that we will obtain a mapping of the best candidates among the asteroids close to Earth, for use as a means of transporting cargo between our planet and Mars.

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