

IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)  
Space Transportation Solutions for Deep Space Missions (8)

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## SKYHOOK: AFFORDABLE AND SUSTAINABLE SPACE TRAVEL

**Abstract**

Getting to space is complicated and expensive with current technologies. Since the industrial revolution, we have built roads, bridges, parking lots, and other infrastructure to make traveling on Earth easier and more affordable. However, space infrastructure is still in its early stages, and we spend millions of dollars on expensive rockets that can only carry a few thousand pounds of load and barely get us to the Moon. Fortunately, a promising and sustainable solution exists that has already been successfully tested in orbit: the Skyhook. The Skyhook consists of a weight and cable that can be placed in orbit around the Earth and the Moon, which would allow for ships to be accelerated to high velocities and easily travel to the Moon and other planets. The Skyhook concept has numerous benefits over traditional rockets. The tethers are relatively inexpensive and do not require advanced materials, which makes them a sustainable solution for space travel. Using a Skyhook for transportation would allow for lower costs and smaller spacecraft, as the tether would accelerate and decelerate the spacecraft without the need for additional fuel. This could potentially decrease the time it takes to travel to Mars from 9 months to 3 months and reduce the scale of rockets by 84-96%. However, the Skyhook concept also has its challenges. The tethers would have to be placed at a certain height to avoid atmospheric drag and burn up, which would require specialized ships that can fly at high altitudes. Additionally, the tethers themselves would need to be strong enough to withstand the stresses of accelerating and decelerating spacecraft. Despite these challenges, the Skyhook concept has the potential to revolutionize space travel and make it more affordable and accessible for everyone. By building a transport network for terrestrial planets, we could explore and exploit the rest of the solar system. With further research and development, the Skyhook could become a critical component of our future in space. Overall, the Skyhook technology offers a promising solution to the challenges of space travel that draws parallels to our current infrastructure on Earth.