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## Creating Gravity in Space: Artificial Gravity

The interest in space and space travel increases with the influence of the films taken, which in turn leads to the question of how applicable the concepts in such films are. In this article, let's take a look at whether the artificial gravity spacecraft mentioned in *Interstellar* is logical. As space travel does not have gravity effect, it is inevitable that people who are going to go on such trips will encounter problems such as bone loss and loss of muscle mass in the long term. The crew of the International Space Station (ISS) is exercising at regular intervals to eliminate or at least reduce these effects. However, these exercises are still not the definitive solution of the problem.

If you're going to have to live in a non-gravity environment for a long time, you'll need to look for a way to create gravity, artificially. In many films, an artificial gravity joker is used to solve this problem. In fact, creating artificial gravity is a laborious task, but there are still a number of ways.

### Crazy Ideas

One of them is artificial gravity with linear acceleration. The vehicle gains a constant speed and exerts a counter-direction force on the objects inside. This is the same as you feel in a car that suddenly accelerates. The only difference is that this event will be done continuously in space. However, due to the fact that a vehicle is the maximum limit to which a vehicle can accelerate, and due to orbital mechanics, the use of such a vehicle is restricted to certain intervals of long interstellar travel. In other words, although this approach may be a solution, it is practically impossible to maintain it without stopping. Another proposed method is to create an artificial gravity by utilizing the diamagnetic or paramagnetic properties of the substance. Diamagnetic substances are pushed by very strong magnetic fields, paramagnetic substances are drawn. Differences with normal magnetism (ferromagnetism) are small in kinetic effect. In other words, the relationship between a piece of iron and a magnet is almost negligible. For this reason, a spacecraft to work in this way must have very strong magnets. Another method that is not likely to be seen is gravitational electromagnetism and artificial gravity. It is based on the idea of creating a kinetic effect by utilizing the similarities between Einstein's gravitational formulas and Maxwell's field equation formulas. The European Space Agency (ESA) is continuing its research in this area. Another, at least recently, unlikely hypothesis is to create artificial gravity by manipulating the Higgs field. However, more research is needed to accomplish this. The biggest reason why this idea has not been realized so far is the financial inadequacies. NASA has had some work in this field, but all of the work on the international space station has been removed from the shelf because it was a zero gravity survey. However, this did not prevent the use of similar designs in science fiction. One of the most beautiful examples of this is *2001: A Space Odyssey* named Hal was seen in the famous film with artificial intelligence. Another film with an artificial gravity is a spacecraft named *Endurance*, which is mentioned in the *Interstellar* film. The difference is that it is not a space station, it passes through a wormhole orbiting Saturn and goes to another galaxy. Now let's take a look at how these tools work.

### Centrifugal Force

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The effect that an object has on the body due to its rotation around a center. It is caused by the inertia of the object. The centrifugal force on an object is calculated by the formula  $F_{mk} = m \cdot V^2 / r$ . Here  $m$  is the mass,  $V$  is the velocity of the object and  $r$  is the distance between the object and the center around which it rotates. When you are small, it is the event that occurs after you have tied it to the rope and you can quickly pick up the objects around you. Some of the toys you see in the amusement parks work on the same principle. Similarly, this is the force that prevents teas from falling and pouring when the trays carried by the tea-makers move.

## **But How Will It Work?**

It can be difficult to ensure that an object is rotated in space in a controlled manner around itself. Even in the event of a slight unbalance in weight, the vehicle will begin to wobble. Think about the washing machine being thrown into the brick. To correct this situation, very precise balancer adjustable weights will be required. Dangerous situations occur when this is not achieved.

There is more technology to explore in front of our species that must go to Mars and beyond. All we need is a little curiosity and courage. Artificial gravity technology is one of the important and important steps in this way whether or not one of the methods mentioned above.

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