Asteroid Colony

In 2013, NASA said it wants to mine asteroids for precious metals and other resources. While this is a formidable idea and will drum up lots of benefits, I think we should take it one step further and colonize them. Colonizing a large number of asteroids will create multiple space colonies. These individual colonies can be sent to explore and settle other parts of the Milky Way galaxy. Space colonization will ensure the survival of humanity and dramatically increase availability of natural resources. Colonizing asteroids is the best solution to creating self-sustaining space communities that will explore the ever-expanding universe.

To accomplish this, an asteroid will need to be pulled into Earth's orbit. This asteroid will have to fit a list of non-negotiable requirements. The asteroid has to be very big; the bigger the better. Plus, it needs to be rich in natural resources like water and metals, especially the former. Once the asteroid becomes earth's satellite, the next step is to turn it into a self-sustaining civilization. Food, water, and basic necessities should be covered for all current, and future, inhabitants. Furthermore, problems like radiation, low gravity, and energy should be resolved. Once all these problems are taken care, the satellite-settlement will be rigorously tested to see how long it can survive on its own and how self-sustaining it is. All contact with planet earth will be cut-off and the satellite settlement will have to survive and sustain itself for as long as possible. Each time it is unsuccessful, everyone will come together and figure out a solution to the problem and why the entire operation failed. This testing process will continue until the asteroid is self-sustaining and can survive without intervention from planet earth. Finally, the asteroid will break free from earth's orbit and begin its exploration of the universe.

However, this is easier said than done. There are a lot of challenges and problems in creating a self-sustaining community that can survive the harsh environment of space. This paragraph covers the major problems with space settlement and exploration. First of all, gravity is weaker in space. Exposure to weak gravity causes a myriad of problems like osteoporosis, bone loss, muscle degradation, sickness, etc.

(Dunbar, 2015). In order to combat this, artificial gravity will need to be utilized. The asteroid will need to be constantly spinning to simulate gravity. Secondly, solar energy follows the inverse square law (Allison, 2018). The further you move away from the sun, the less effective and powerful solar energy is. For instance, if the sun is twice as far away, then the energy exposure is a quarter (Allison, 2018). A possible solution to this is to use nuclear energy to generate electricity. The waste can be dumped into the ever-expanding universe. Another solution is to use hydrogen and helium, the two most abundant elements in the universe, to create electricity. Plus, all electronics and equipment will be as efficient as possible to conserve as much electricity/energy as possible. One possible way to accomplish this is to use ARM processors in all computers and electronics that require a CPU. ARM was built to use less power and be energy efficient. Thirdly, the asteroid will need some form of protection against solar and cosmic radiation. Cosmic rays are high energy particles that are very harmful to humans (Allison, 2018). The best solution to this problem is to build deep inside the asteroid and have lots of shielding in the structures. This is one of the reasons why the asteroid needs to be very big, thick, and rich in natural resources like metals. Also, the asteroid will need lots of asteroid detection observatories and asteroid impact avoidance protocols to dodge harmful space debris. This is relatively simple and current technology is adequate for detection. Finally, there needs to be a way to create food, water, medicine, and other basic necessities. Recently, researchers and scientists have demonstrated how water can be regenerated on asteroids. Meteoroids impact the asteroids, and solar winds blast the surface leaving unbonded oxygen and hydrogen atoms to bond, creating water (Zhu et al., 2019). This water can be used in the production of food; which is extremely important for survival and sustainability. Luckily, growing vegetables in space is possible and has been done multiple times aboard the ISS. The Advanced Planet Habitat (APH) is a growth chamber on the ISS. It uses LED lights and a special soil to grow food. It is enclosed and almost completely automated. It delivers water, nutrients, and oxygen to the plant's roots with minimal supervision (Heiney, 2019). Once any kind of plant can be grown, creating medicine will be much easier, since most medicines are derived from plants. In addition, genetically modified plants can be used to strictly create medicine on a mass scale.

Colonizing asteroids may be the future of space travel and the survival of humanity. The idea may seem far-fetched, right now, but with proper tools and techniques, this “fantasy-iscal" idea can become reality. Space is full of resources, and asteroids are perfect for establishing settlements. These self-sustaining "mini-planets" are a great way of exploring the Milky Way galaxy. If we can't bring earth to mars, maybe we can bring a "piece of earth" to mars. And even if the whole thing is unfeasible, asteroids can be used for other things. For instance, they can be used as transport vessels for rockets and spaceships. Asteroids to rockets are like aircraft carriers to aircrafts. The possibilities are endless!

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