QSC 2017 Case Competition: The Problem of Space Junk

Currently, humans are very keen on the idea of environmental conservation. However, there is a large environment around us that people constantly seem to discount.

According to NASA, there are more than 20,000 pieces of debris larger than a softball orbiting the Earth. There are 500,000 pieces of debris the size of a marble or larger. There are many millions of pieces of debris that are so small they can't be tracked. And the numbers only continue to grow. Orbital debris can travel at speeds up to 17,500 mph, fast enough for a relatively small piece of orbital debris to damage a satellite or a spacecraft. "A 10-centimeter sphere of aluminum would be like 7 kilograms of TNT," said NASA scientist Jack Bacon. "It would blow everything to smithereens."

The growing amount of "space junk" in Earth's orbit heightens the potential danger to all space vehicles, but especially to the International Space Station, space shuttles and other spacecraft with humans aboard. As more interest grows in sending humans to populate Mars, the problem of space junk becomes increasingly pressing as it could affect the ability to get manned spacecraft to Mars, or cause severe harm to possible orbital refuelling stations.

For the future, NASA and other space agencies have established measures to reduce space pollution which includes creating a rule stating that anyone who sends an object such as a satellite into space must plan to have it return to earth in 25 years. However, NASA's chief scientist for orbital debris, Jer Chyi Lou, said only about half of the world's space missions today plan on bringing their spacecraft back in that period, mostly due to monetary restraints.

To reduce the risk of orbital debris on satellites, the ISS, spacecraft, and other important space vehicles, we must consider ways of removing space junk from Earth's orbit.

A coalition of space-faring nations has invited you to develop an inventive solution to the problem. Your task is to design an innovative method of cleaning up space junk around the planet. You should consider technological feasibility, as well as economic plausibility, time frame, and any further environmental impacts your solution may have. Each presentation will be 7 minutes followed by a 1 minute Q&A with the judges.

Good luck in helping humankind take a giant step forward to leave a green footprint on our solar system!