**Introduction:**

Asteriod mining is frequently characterized as an outlandish, science-ficitious proposition. However, some of earth’s most valuable minerals – including gold, cobalt, iron, manganese, nickel, palladium, and platinum – all originated in asteroids from outer space that crashed into earth’s surface. [1] The materials extracted from asteroids have a wide-range of use-cases as they can be used in the production of everything from rocket fuel to fine jewelry.

Of all of the potential materials found in asteroids, water and metals are among the most prized. Water for instance, is absolutely essential to support life in space. However, it costs a great deal to bring it into space. Launch costs for water are at thousands of dollars per pound. If water could be sourced in space, it would save tremendous amounts of money and energy over time. Moreover, it can be broken down into hydrogen and oxygen for use as rocket fuel.

Asteriod mining is a highly complex undertaking from start to finish. To begin, a viable candidates must be surveyed, identified, and selected. Prospecting asteroids to determine their composition is done based on their optical and infrared spectra. This requires large telescopes. [2] In deciding which asteroids to target, the relative difficulty of accessing the asteroids in questions is a chief concern. Therefore, near-earth asteroids (NEAs), which have low velocities and are relatively close to earth (between 0.983 and 1.3 AU away from the sun) are prime candidates because they are the easiest to survey and access. [3] There are thousands near earth.

There are three different types of asteroids that are being targeted: m-type, s-type, and c-type asteroids. M-type asteroids are the least common, but also have far more metallic content than both c and s-type asteroids. S-type asteroids have a diverse range of metals such as nickel, gold, and platinum. However, they have less water, which could increases cost of mission. For example, a small S-type asteroids is about 1,433,000 pounds, and about 110 pounds of the asteroids is comprised of rare metals such as platinum and gold. [4] C-type asteroids do not have much metal content, but do have an abundance of ingredients necessary for fertilizers, such as carbon and phosphorous. These would be useful for growing food in space.