

45th STUDENT CONFERENCE (E2)  
Student Team Competition (3-GTS.4)

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A NOVEL LIFECYCLE EXTENSION PLAN FOR THE EFFICIENT USAGE OF ON-ORBIT  
POST-CONSUMER ASSETS**Abstract**

Asteroid mining is a potential form of commercial space industry, and significant amounts of research have gone into the feasibility of that activity. Less research has been done on what happens to the asteroid post-mining; the two primary end-of-life scenarios for the remains of a mined asteroid are not ideal. The remains could be deorbited, which entails complex technical and legal challenges, or they could remain in orbit, which could lead to collisions and a general increase in space debris. This proposal outlines a solution for the post-consumer asteroid issue which avoids creating more space debris and the risky business of de-orbiting. This solution is to use the post-consumer asteroid shell as a shelter for delicate equipment or as a “garbage can in space,” which would hold the remains of defunct satellites until the time they could be more safely de-orbited. The shell of the asteroid would provide protection from space debris impacts and some radiation. This proposal also discusses some of the major technical and legal challenges that this solution would face, and how stakeholders could potentially address them. More research is required to gain a better understanding of the challenges and opportunities that this proposal faces, which can be conducted during the long-term development of commercial asteroid mining technologies.