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A Transformable and In-Orbit Manufacturable Space Debris Collector

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Researchers at Purdue University have developed a platform for space debris collection to combat the exponentially increasing debris present in earth orbit. To meet the ever-evolving needs for compact deployable spacecrafts, the system leverages a multi-layer conical-kresling origami pattern that folds in sequence to trap debris while leaving other layers expanded to capture more debris. This geometry also results in greater ability to withstand debris impact. The structure is designed around additive manufacturing to leverage the advantages of in-orbit production. The primary application of Purdue's system is risk reduction for organizations interested in spacecraft orbit and operation.

Technology Validation

This technology has been validated through the fabrication and testing of a scaled down prototype system.

Advantages

-Multiple layers for staged debris capture

-Designed for impact absorption

-Manufacturable in-orbit

Applications

-Reducing risk of damage from space debris

-Spacecraft orbit and operation

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