



The Aerospace Corporation's role as a pioneer in space debris management has been further enhanced by the development of Brane Craft, a spacecraft that can economically and efficiently remove space debris.

An Original Concept for Debris Removal

The Brane Craft concept can best be compared to an automated spot cleaner in space. Invented by Aerospace's Dr. Siegfried Janson, Brane Craft is a flat 3' x 3' spacecraft that looks like a piece of wrapping paper. Less than half the thickness of a human hair, Brane Craft is exceptionally light, maneuverable, and fuel efficient. Brane Craft collects orbiting space debris by wrapping itself around the debris, then lowering the debris to burn up in Earth's atmosphere.

Brane Craft is also cost efficient. The price for a launch payload is approximately \$10,000 per lb. Weighing in at less than 3 oz, makes Brane Craft far more affordable to deliver to orbit. The Spacecraft would also be able to travel long distances, allowing for missions where scattered space debris fragments need to be contained and disposed of simultaneously. The concept currently includes an experimental ionic liquid thruster system that will give the 30-micron-thick Brane Craft a very high thrust-to-weight ratio, enabling it to travel to any near-Earth asteroid, orbit Mars or Venus, and return to Earth.

Brane Craft NASA Sponsorship

Brane Craft is funded by a 2017 NASA Innovative Advanced Concepts (NIAC) Phase II award, which recognizes those with the potential to revolutionize the future of space exploration. In Phase II, Dr. Janson and his team will focus efforts on analyzing and documenting the benefits, limitations, mission operations, and size-scaling of the Brane Craft for removing orbital debris. They will also attempt to execute laboratory demonstrations of thin-film electronics for communications, command and control, power conditioning, sensing, and shape control.

The Aerospace Corporation

Aerospace is a nonprofit corporation that operates a federally funded research and development center (FFRDC) for the United States Air Force. This FFRDC spans the entire space domain for government as well as civil space and other federal agencies. With a world-class workforce of roughly 3,000 engineers and scientists, Aerospace is able to respond with agility to the unique challenges posed by national security space requirements, delivering well-defined, innovative solutions that assure mission success.

Brane Craft

- › is a flat 3-foot x 3-foot maneuverable and fuel-efficient spacecraft, about 50 microns thick
- › envelops itself around space debris, then lowers the debris to burn up in Earth's atmosphere
- › is economical due to extremely light weight
- › has an advanced propulsion system enabling it to travel long distances and return to Earth



Dr. Siegfried Janson showing how Brane Craft will wrap itself around an object to help it deorbit and burn up in Earth's atmosphere.