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TRAPSat

TRapping space debris with Aerogel Prototype Satellite

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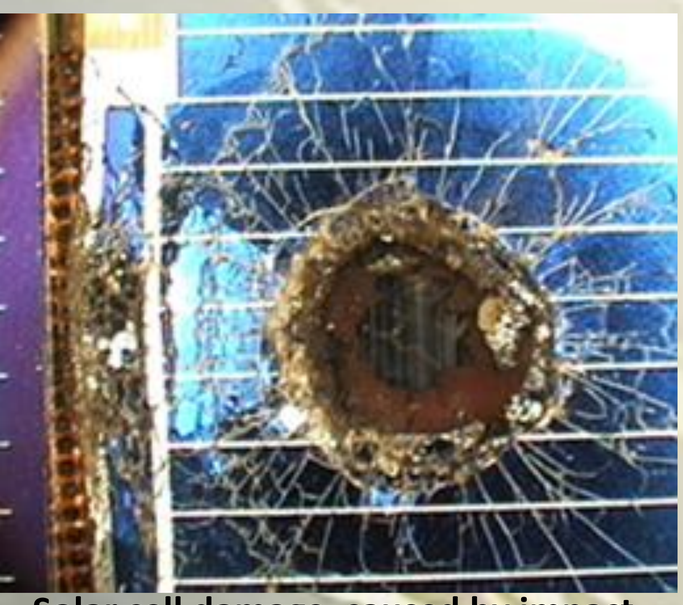
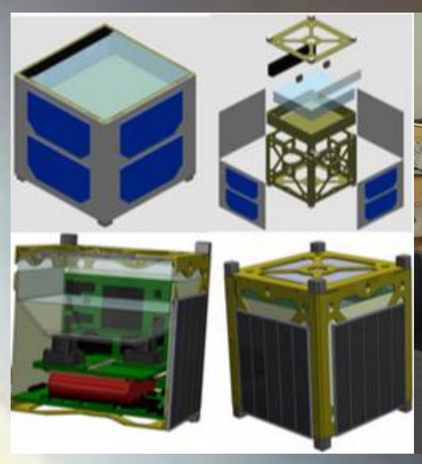
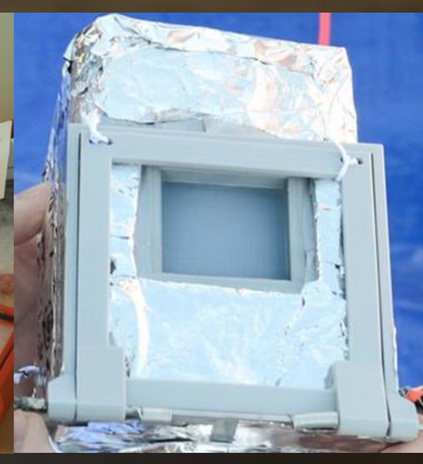


Solar cell damage, caused by impact

Each new mission, increases the amount of debris, resulting in a higher probability of impact.
Catastrophic collisions become more likely as do small impacts, decreasing the average lifetime for a satellite.

TRAPSat can help identify particles in a desired orbit by documenting where, it was impacted. On TRAPSat, a characteristic streak is made in Aerogel when there is an impact with anything along its path.





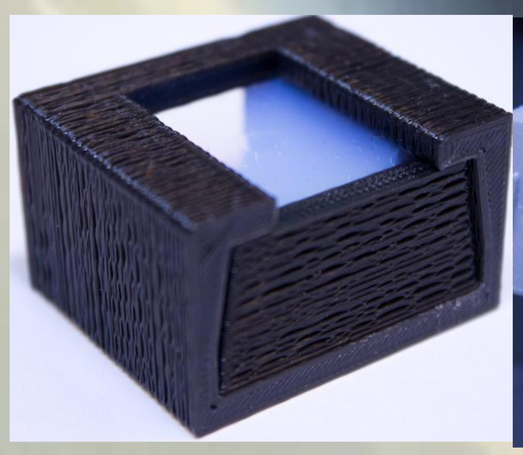
Iterative design process involves small changes over many iterations, allowing for rapid prototyping and testing of new ideas with less risk. It's a fast way to solve mission challenges as they arise.

First Flight Image -spring 2014

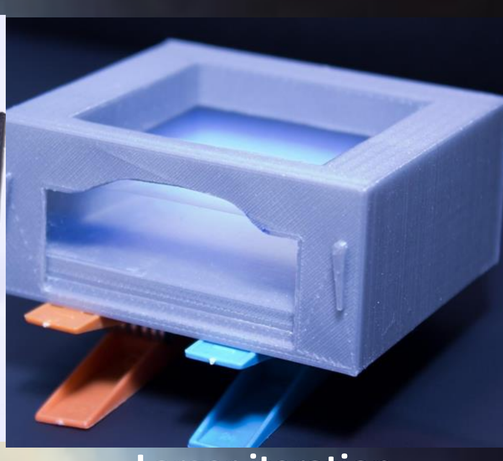
Aerogel is an extremely porous material, ideal for capturing debris.
This property makes Aerogel difficult to work with; it is prone to contamination and fractures. This drove the need for a way to handle the Aerogel.

Current Image - spring 2015

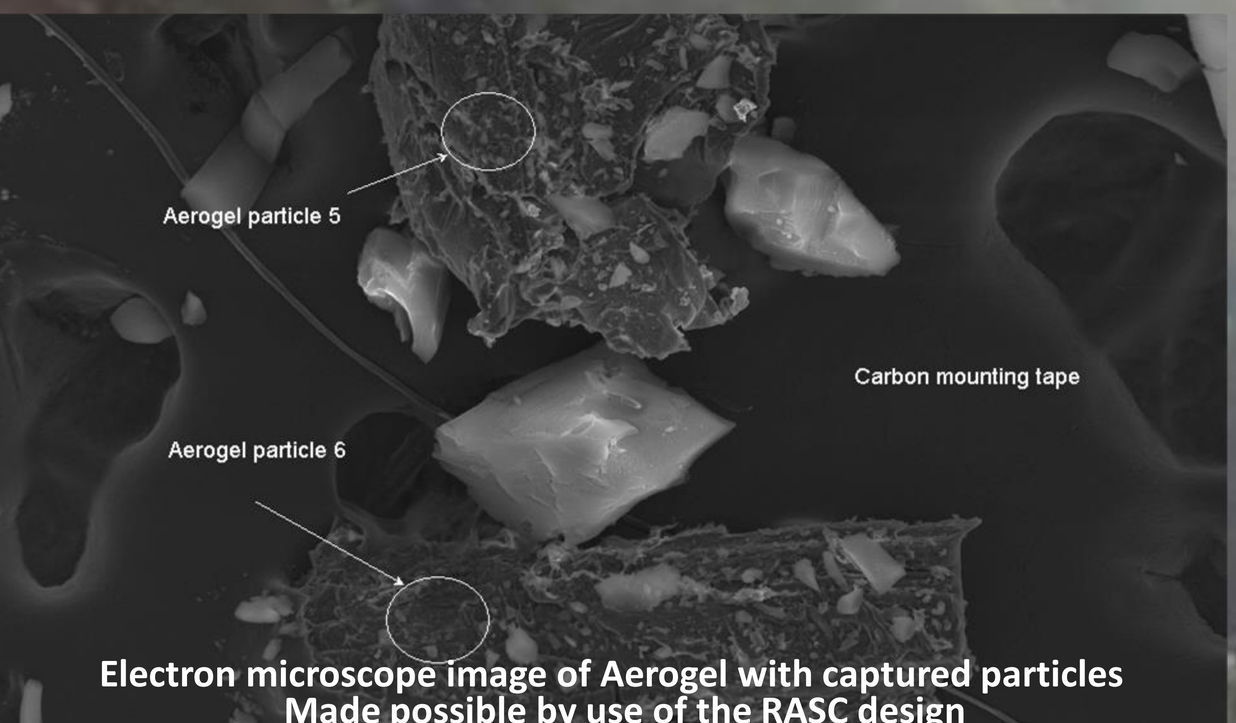
Removable Aerogel Support Container (RASC), a 3D-printed handling mechanism.
At version 4, it prevents damage during integration, flight, and removal of Aerogel for analysis.



Early RASC



Larger iteration



Electron microscope image of Aerogel with captured particles
Made possible by use of the RASC design

After 4 High Altitude Balloon flights, we are now pushing towards orbital mission, CACTUS-1 in 2018 as part of NASA's cubesat initiative.