Project TwoPager | EuroTeQathon III

Our third EuroTeQathon will be hosted in Prague (CTU) from Saturday June 10th until Monday June 12th 2023. In preparation of this event every (selected) Collider project is asked to submit a TwoPager on their project according to the locally communicated deadline and procedure. This document will be used by the jury to complement the final presentation on Monday and have a good overview of all the different projects.

PROJECT DETAILS

Challenge Collaborator: Student Team Aster, TU/e

Team name: Space Junk Juggernauts

Team slogan: *"Smarter solutions today, cleaner skies tomorrow!"*

Team members:

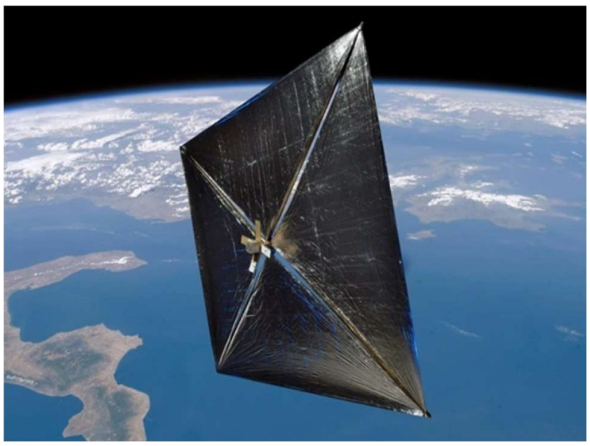
Name	Study Program	University
Alena Zikmundová	Project Management of Innovations	CTU
Kai Snoeren	Psychology and Technology	TU/e
Tiasa Das	Automotive Technology	TU/e
Eashwar Ravikkumar	Systems and Control	TU/e
Max Peter	School of Social Science and Technology	TUM

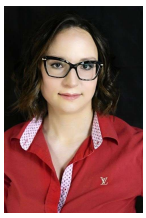
What is the target problem for your project (in one sentence)?

Our target problem is prevention of cube satellites in the Low Earth Orbit (LEO) from becoming space debris.

How do you solve it (in max. three sentences)?

Our proposed solution is an affordable de-orbit system based on drag sail technology. It is a game-changing solution as it is an add-on system which deploys a large, lightweight sail that increases the drag area, significantly reducing the time it takes for satellites to re-enter the Earth's atmosphere.





Alena

Kai

Tiasa

Eashwar

Max

Potential for impact

Cube satellites (or cubesats) are small yet powerful tools that can transform how we think about space exploration. Our solution is committed to the sustainable use of space, considering the entire lifecycle of our product, from manufacturing to disposal. By offering a reliable, sustainable de-orbit system, we enable a future where space missions using cubesats can be conducted without leaving behind harmful debris. Space agencies and satellite launchers worldwide could benefit from a cleaner sky.

In essence, cube satellites with our solution promise a brighter future where space exploration works in harmony with our environment, society, and economy. Whether we are talking about everyday people or leading experts in their fields, there's no doubt that these compact crafts hold the keys to unlocking exciting possibilities for generations to come.

Innovation

Our solution's simplicity, scalability, and cost-effectiveness set it apart from others (such as the ARTICA project). The drag sail technology is based on various proven research conducted by multiple universities and space agencies. We have taken this technology further, ensuring that our solution is adaptable to any cube satellite in LEO, regardless of size or mission objectives. By designing an add-on solution, we bridge the gap between space companies and a debris-free space, keeping it accessible to all satellite operators and space missions.

Feasibility

Due to recent advances in technology, it is possible to manufacture space-grade materials using 3D printing techniques. Our drag sail technology is based on proven principles and has been successfully implemented in recent small spacecraft missions.

The solution extends to universities and private satellite builders due to its innovation, affordability, and compactness. Also, space agencies are looking at ways to reduce space debris as it is becoming an issue fast. Coming up with a solution to the problem has definite business potential within contracts with space agencies such as ESA.

Inclusivity

Space agencies (like ESA and NASA), satellite operators, and the entire space industry share the responsibility to address this critical issue. The primary stakeholder in contact with us is student Team Aster, who provided us with information about our solution's feasibility and restrictions on building a satellite. We also considered our solution's engineering feasibility, environmental impact and social acceptance.