

A high-angle photograph of a space station module, likely the International Space Station, orbiting Earth. The station's complex structure, including solar panel arrays and various modules, is visible against the bright blue and white clouds of the planet. The horizon of the Earth is visible in the upper left, showing a thin blue line of the atmosphere.

Frontier Space Technologies Ltd

Enabling humanity to benefit from space

OUR COMPANY

Frontier Space Technologies aims to help humanity benefit from space by improving access to space and enabling responsible space use

***Frontier Space
Technologies Ltd***



Enabling biological, pharmaceutical, and materials science research in space environments on a miniaturised orbital laboratory platform



Reducing de-orbit time using drag sails for small satellites, enabling responsible space use while also extending end-of-life mission possibilities



BIOCUBESATS PLATFORM

LIFE SCIENCES

Rapidly growing research area (renewed interest in long-duration spaceflight); biotechnology and space biomanufacturing exploit microgravity to benefit humans on Earth

MATERIALS RESEARCH

Monitoring material manufacturing and degradation processes of materials in low Earth orbit



MEDICINE

BioCubeSat platform can support pharmaceutical research and development in space for Earth and space applications

DEVELOPMENT IN SPACE

Further development of technologies such as the BioCubeSat and drag sails

SUSTAINABLE SPACE



Low Earth Orbit (LEO)

LEO itself is a **valuable resource** and needs to be protected



Space Debris

Space debris is a **critical threat** to future and on-going missions



Mitigation; Drag Sails

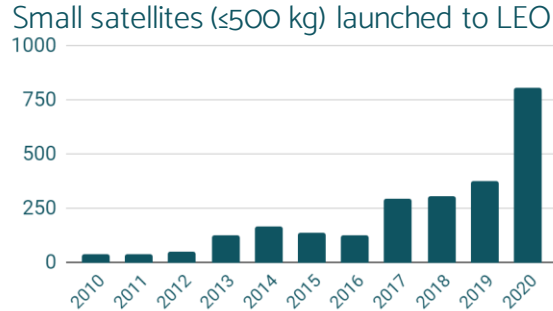
25 years is **not the goal**; drag sails are a low-cost, low-mass and **low-impact** solution

VALUE PROPOSITION



DRAG SAIL MARKET

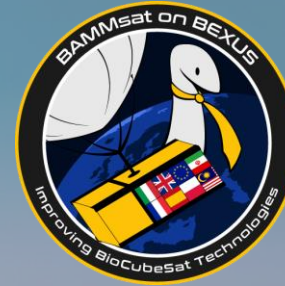
Total Addressable Market Value: €2.54 Billion (2019)
€8.06 Billion (2027)

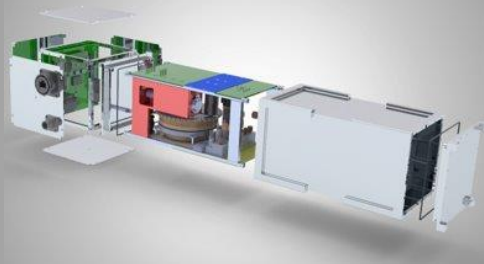


FST DRAG SAIL

Target Market	Small satellites
Target Orbits	600 – 800 km
Volume Envelope	0.3-0.4 U
Overall Mass	<0.5 kg
Max Current Consumption	1 Amp (10 ms)
Secondary Payloads	Various

De-Risk • Improve Customer Confidence • Raise to TRL 9



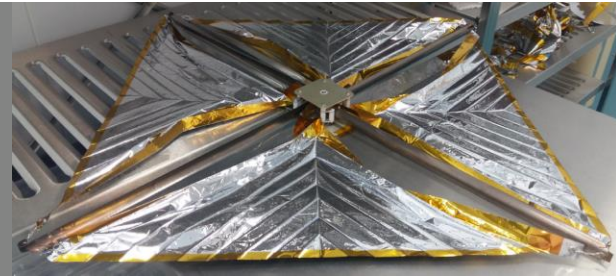
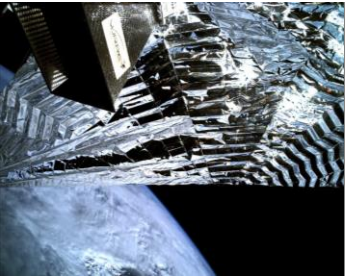
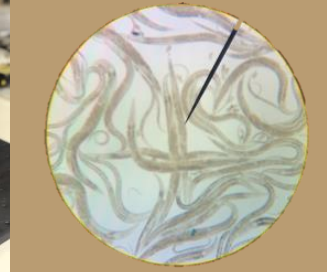
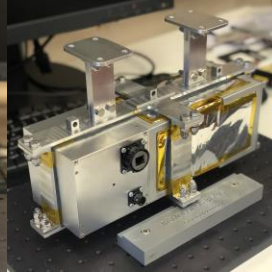
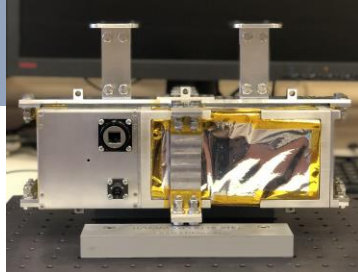


BAMMsat-on-BEXUS

BAMMsat (Bioscience, Astrobiology, Medicine and Material science on CubeSat) aims to enable advanced and cost-effective biological experiments in space

Launching 2021

Under ESA's REXUS/BEXUS programme, BAMMsat is due to launch on a stratospheric balloon mission at the end of 2021



Responsible Space

Extensive experience with space debris mitigation devices, namely drag sails, will enable Frontier Space Technologies to operate responsibly and sustainably

OUR TEAM



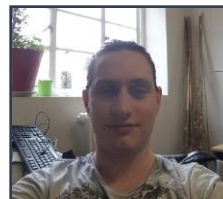
**Aqeel Shamsul
(PhD)**

BioCubeSat
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Management



Mat Zalasiewicz (MSc)
Director

Mechanical & Software
Space systems Eng.
Simulation modelling



Michael Cooke (PhD)
Director

Biology & life sciences
Space biology experience



**Zaria Serfontein
(PhD)**

Drag sail specialist
Space systems Eng.



**Giovanni Sinclair
(MSc)**

Electronics
Space systems Eng.



**Adrien Bolliand
(MSc)**

Thermal
Space systems Eng.



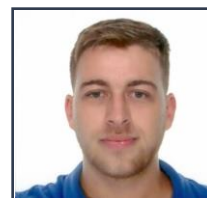
**Tommaso Tonina
(MSc)**

Orbital and mission
analysis



Prof David Cullen
Advisor

Space biotechnology
Space systems Eng.
ESA advisory board experience



**Miguel Martinez de Bujo
(MSc)**

AOCS & Propulsion
Space systems Eng.



Frontier Space Technologies Ltd

Questions?

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Cranfield University's Icarus-1 sail deployed on-
board TechDemoSat-1, May 2019
Credit: SSTL