Developing a low-cost, performant microsatellite platform design for all.

OPEN SOURCE

- The Open Source Satellite Programme
  - **Open Source CubeSat Workshop** Athens – 15<sup>th</sup> October 2019





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WHY?

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WHY?

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# OUR VISION, OUR MISSION

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Our Vision: To make space more accessible.

Our Mission: To stimulate utilisation and exploitation, new applications and services, and to promote responsible and sustainable use of space.

![](_page_12_Picture_4.jpeg)

Embracing open source principles, our goal is to develop a 25kg-250kg class, fully open source satellite platform and to make the design readily available to all as a foundation on which new systems can be built.

- A performant, capable and modular microsatellite platform
- A design that can be readily tailored
- An approach using COTS parts, processes and tools
- A platform that can be upgraded and reconfigured after launch
- A solution that can operate with multiple ground station networks
- A design available to all

Initiating the development and the on-going nurturing of an open source community that uses, contributes and supports the Open Source Satellite Programme

## OUR PLEDGE

![](_page_13_Picture_1.jpeg)

Our Pledge: To make <u>all</u> the open source satellite platform design openly and freely available one year after the launch of the first satellite.

Information will be released prior through the website and to supporters and sponsors.

![](_page_13_Picture_4.jpeg)

![](_page_13_Figure_5.jpeg)

# SPACECRAFT MARKET SEGMENTATION

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Traditional Small Satellites	100kg-250kg LEO	Exquisite "one-offs"		Constellation Microsatellites	150kg-250kg Harsh LEO	High-volume "cookie cutter"
Big satellites in a smaller box	Affordability challenge	Difficult to scale down for smaller missions		High optimization Low modularity	Unaffordable in low volumes	Accessibility challenge
Cubecata	1kg-30kg	Modular, small	I	OPEN	25kg-250kg	Versatile,
Cubesats	1kg-30kg Benign LEO	Modular, small payloads		OPEN SOURCE SATELLITE	25kg-250kg LEO, MEO, GEO +	Versatile, scalable

#### CAPABILITIES

![](_page_15_Picture_1.jpeg)

Fully Open- Source microsatellite platform	Highly performant at a Cubesat price	Scalable, robust architecture	Modular and versatile	Launch mass 25kg-250kg
>70% payload mass fraction	Payload volume 600x600x450m (maximum)	Scalable payload power options 10W to 1kW	Adaptable pointing, knowledge, control, agility	Low Earth orbit 400km-850km
5-7 year lifetime	<14-month recurrent schedule	Mission- configurable	Standard payload interfaces	Standard equipment interfaces
Dedicated and rideshare launcher compatibility	Ground segment interoperability	Application- enabling	Low procurement cost	Low commissioning cost
Low operating cost through mission life	Space debris mitigation and End of Life management	Enabling and facilitating global participation	Community and User-influenced specification and roadmap	Ground-based model for training and development

# MISSION #1 TIMELINE

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		20	18			20	19			202	)		20	)21			20	22			20	23	
	Q1	Q2	Q3	<b>Q4</b>	Q1	Q2	Q3	Q4	Q1	Q2 (	3 Q4	l Q1	Q2	Q3	<b>Q4</b>	Q1	Q2	Q3	<b>Q4</b>	Q1	Q2	Q3	Q4
Requirements Capture					-																		
Mission concept																							
Architecture definition																							
Design phase																							
Build phase																							
Testing																							
Launch																							
Mission Operations																		5 to	7 ye	ar m	issior	n life	>
Release of full data set for Mission#1																							

# FUTURE ROADMAP

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Increasing integration with each subsequent variant of the design

## RESOURCES

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#### A repository for sharing of articles, resources and design information

We will release information on our design and activities as we progress design, development and mission milestones. This will include the design drawings, schematics, parts lists, board layouts, software source code and assembly information.

Articles			Resources	Webinars				
	A cost-effective modular, salable, fieldbe robust, reliable microsatellite platform.	Stakeholders Deriving Value Primary Concerns	Schematics Schematic diagrams for the satellite platform electronic subsystems. •••	NOTIFY ME WHEN BOOKING OPEN				
From Stakeholder Viewpoint to Satellite Platform Design, using MBSE. Using a Model-Based Systems Engineering approach to develop a central repository which documents the Open Source Satellite design.	Stakeholder Perspective: What do Open Source Satellite customers need? Providing increased mission and payload capabilities without growing the mass of the spacecraft platform.	Open Source Satellite: Who are our Stakeholders, and what do they worry about? Ensuring our initiative serves the needs of our stakeholders and the community.	Board Layouts Printed circuit board layouts for the platform electronic subsystems.					
Sharing ide at the hea do. Our latest deve Source Sa consider invite stake	eas and info art of every articles disc lopments ir atellite prog industry ne	rmation is thing we cuss the the Open gramme, ews, and versations.	A library of Resources will be made available to everyone: information to develop open source satellite missions. Opportunities for early access and co-development available for supporters and sponsors	Community members from around the world can join live interaction events to and download Videos on demand.				

Community and User Forum in development: Learn, share and work together

# HOW TO GET INVOLVED

![](_page_19_Picture_1.jpeg)

Embrace the potential and play a part in the success of the Open Source Satellite Programme

![](_page_19_Picture_3.jpeg)

We are seeking sponsors and partners to help to accelerate the development of the world's first open-source microsatellite.

We want to develop a community that can make meaningful contributions to our goal to develop a low-cost, highly-capable fully open-source microsatellite that will stimulate new missions, applications and bring the benefits of space to many more people

We are planning to share the detailed design data with strategic sponsors and partners, before the information is released to the public.

![](_page_20_Picture_0.jpeg)

#### Join us on the journey to design and launch the World's first open source microsatellite platform..

info@opensourcesatellite.org

![](_page_20_Picture_3.jpeg)

近 @SatelliteOpen

# FIND OUT MORE, GET IN TOUCH

![](_page_21_Picture_1.jpeg)

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![](_page_22_Picture_0.jpeg)

![](_page_22_Picture_1.jpeg)

# OPEN SOURCE SATELLITE