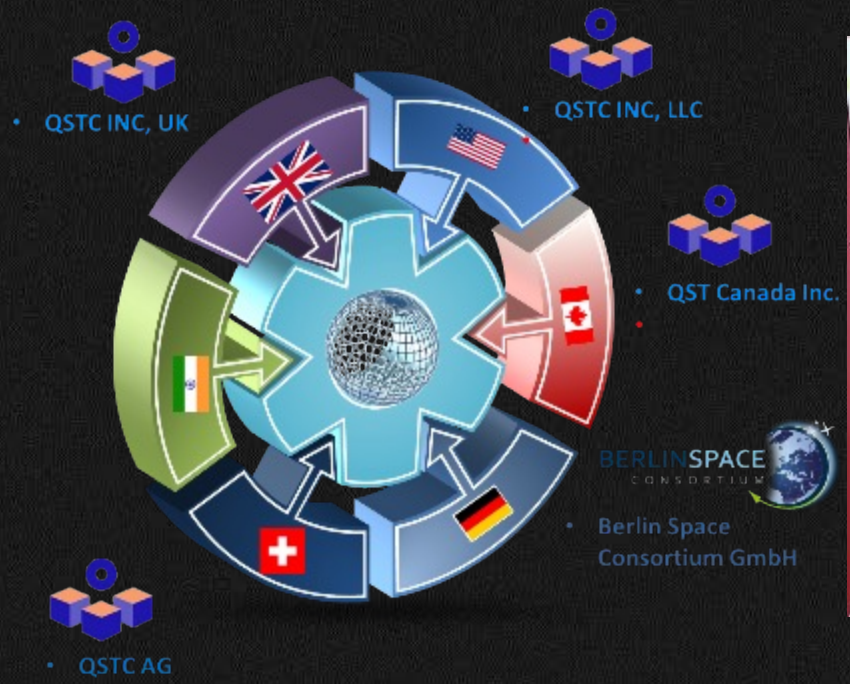

CUBESAT
VISION
SMALL SMART –
INTELLIGENT SATELLITES
Gurvinder Chohan -CEO

QSTC was founded to enhance and provide **global and planetary-scale telecommunications and remote sensing services**

We develop space-based Smart small satellites (communications), AI/ML based remote sensing and deep space solutions , **enabling a internet from space** to offer ubiquitous high-capacity connectivity, interoperable with SDA Transport Layer.

Vertical integration and quick rollout of technology and infrastructure are at the core of our strategy to maintain cost, schedule, quality and performance and deliver on our promise of becoming a responsive industry partner within National Security Space.

Our **team** of high-performance engineers have come together to accomplish wonders. We bring decades of experience in Space-tech R&D innovation, SATCOM Infrastructure, mobile communication services, and Operations.



02 LEO Key Capabilities

GLOBAL NEEDS

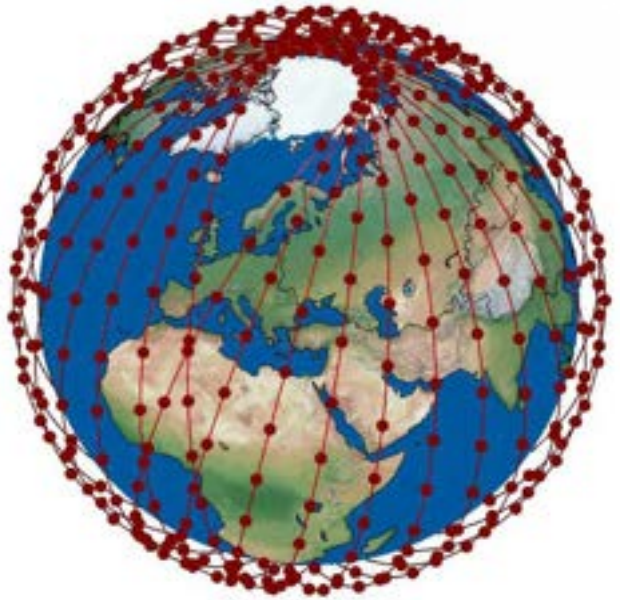
Qstc

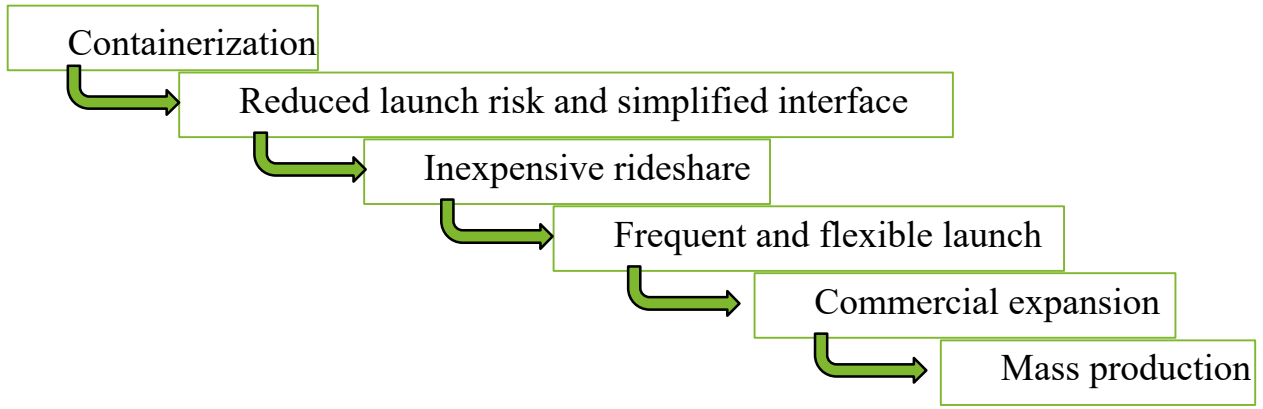
Next Generation

CubeSats and the Small-Satellite Revolution

The power of "Containerization"

- CubeSats revolutionized the small satellite industry through containerization, just as containerization revolutionized terrestrial shipping
  - *Containerization simplifies the interfaee and proteets the host enabling inexpensive rideshare*
  - *CubeSats have flown on at least 20 different launeh vehieIe types*
- CubeSats are rigidly constrained by the volume of the container
  - Limits on power and aperture, even with complex deployables





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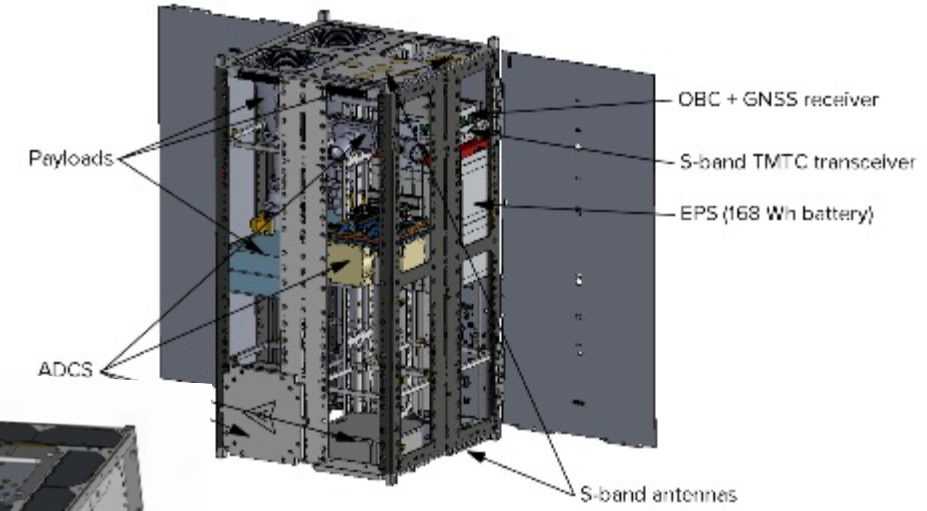
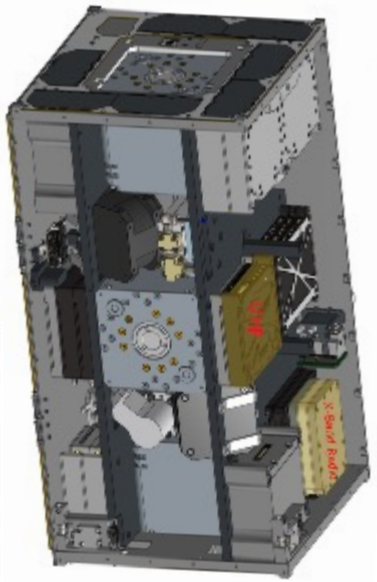
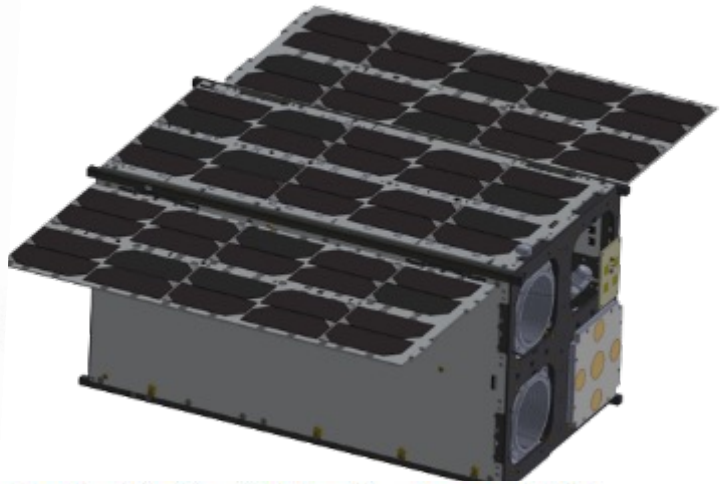
16U Cube sat

Band name	Uplink frequencies	Downlink frequencies
L	1626 – 1675 MHz	1518 – 1559 MHz
Ku	12.5 – 14.8 GHz	10.7 – 12.75 GHz
Ka	27.0 – 31.0 GHz	17.3 – 21.2 GHz
Q/V	33-75 Ghz (MEO)	
Ku	12.5 – 14.8 GHz	10.7 – 12.75 GHz
Ka	27.0 – 31.0 GHz	17.3 – 21.2 GHz

Band name	Uplink frequencies	Downlink frequencies
UHF	250Mhz -270 Mhz	
Ka	27.0 – 31.0 GHz	17.3 – 21.2 GHz
SHF	7.25-7.75 GHz	7.90-8.40 GHz







System	Subsystem	Dimensions [U]
Structure	16U Spacecraft Structure	16-20
Power System	EPS II (168 Wh capacity)	1.86
	2x Deployable 8U Solar Arrays	-
	2x Body-mounted 8U Solar Arrays	-
Data Handling	OBC + GNSS receiver	0.20
AOCS	CubeSpace ADCS (3-axis stabilized)	1.50
	2x Thrusters for attitude maneuvers in GEO	2.00
Communication System	S-band TMTC Transceiver	0.30
	2x S-band active antenna	0.20
	GNSS antenna	-
Payload	QSTC Payload 1	0.20
	QSTC Payload 2	0.10
	QSTC Payload 3	6.00
Total volume		10.5 U
Total volume with 10% margin		11.6 U

Operational mode	Phoenix	Safe	Detumbling	IDLE	Downlink	Maneuver	Payload
EPS	1.5 W	2.0 W	2.0 W	2.0 W	2.5 W	2.5 W	2.5 W
OBC	-	0.5 W	1.5 W	1.5 W	1.5 W	1.5 W	1.5 W
S-band transceiver	1.8 W	1.8 W	1.8 W	1.8 W	14.0 W	1.8 W	1.8 W
ADCS	-	2.0 W	3.5 W	2.0 W	2.0 W	3.5 W	2.0 W
Thrusters for attitude control	-	-	5.0 W	-	5.0 W	5.0 W	-
Thrusters for orbital control	-	-	-	-	-	TBD	-
Payload 1	-	-	-	-	-	-	16.0 W
Payload 2	-	-	-	-	-	-	3.4 W
Payload 3	-	-	-	-	-	-	40.0 W
Total	**3.3 W**	**6.3 W**	**13.8 W**	**7.3 W**	**25.0 W**	**14.3 W + TBD**	**67.2 W**

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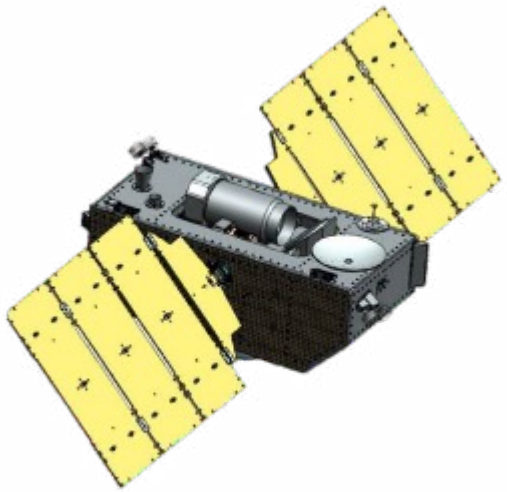
Micro / Small Satellite Platform



Lifetime
15 years

Maneuvering
E/W Station Keeping
Momentum Management
3 relocations at 1°/day

Power
28 V (-4 V / +5 V)
1346 W (BOL)

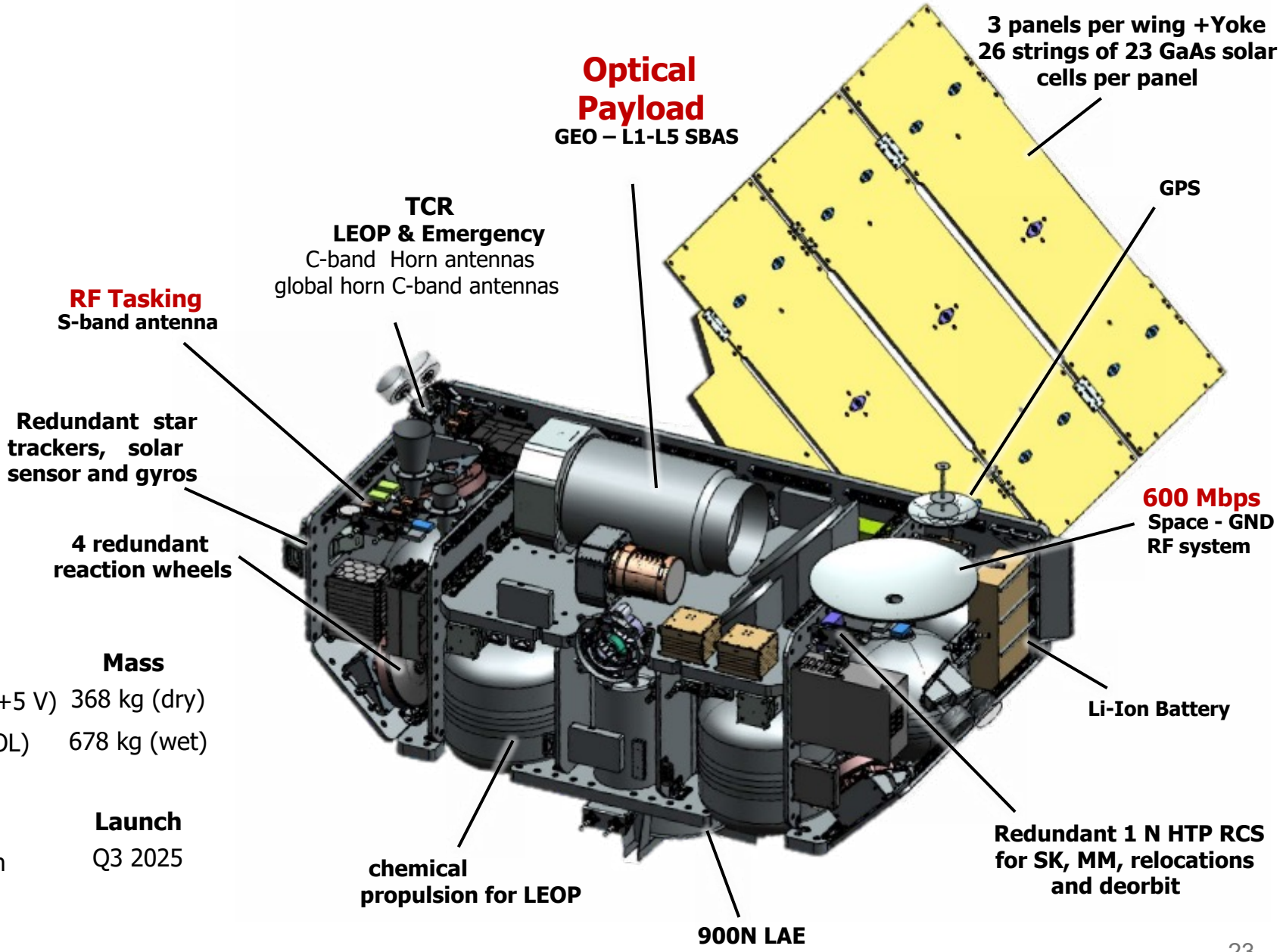
Mass
368 kg (dry)
678 kg (wet)

Orbit (node 1)
136° E GEO

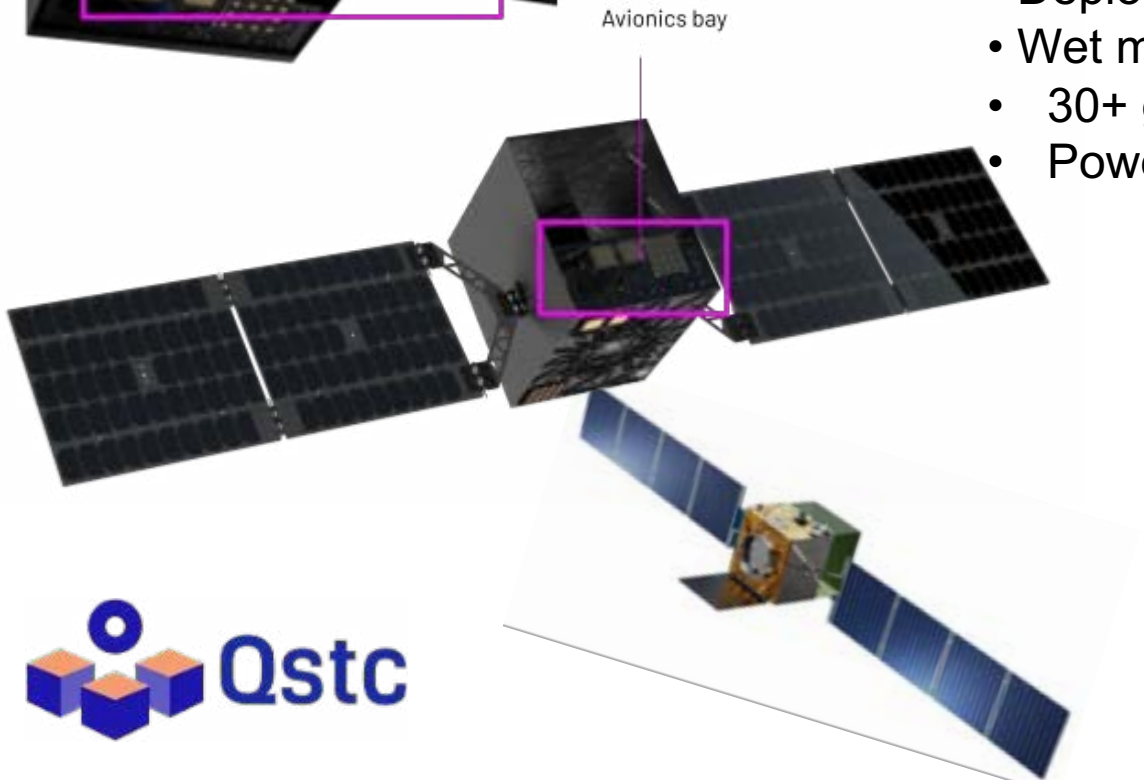
Inclination
Up to ±5°
(No N/S Station Keeping)

LEOP
< 1 month

Launch
Q3 2025



SIGMA MicroSat



- Ka/Ku band single beam transponders
- 500 mm deployable reflectors for 1200 km footprint
- 250 Mbps bent pipe (3meter GND dish) or 25 Mbps (1meter GND dish)
- Fall back global horn for TMTC at 100-1000 kbps
- Redundant TMTC on S-band and X band
- Two-string redundant avionics bus
- 400 watt sun tracking solar arrays
- 15” separation ring, Falcon 9 Quarter plate compatible
- Deployed dimensions: 4.4m x 1.5m x 0.5m
- Wet mass: 60-270 kg
- 30+ gbps throughput multi-beams
- Powerful OBPs with FPGA/ASIC

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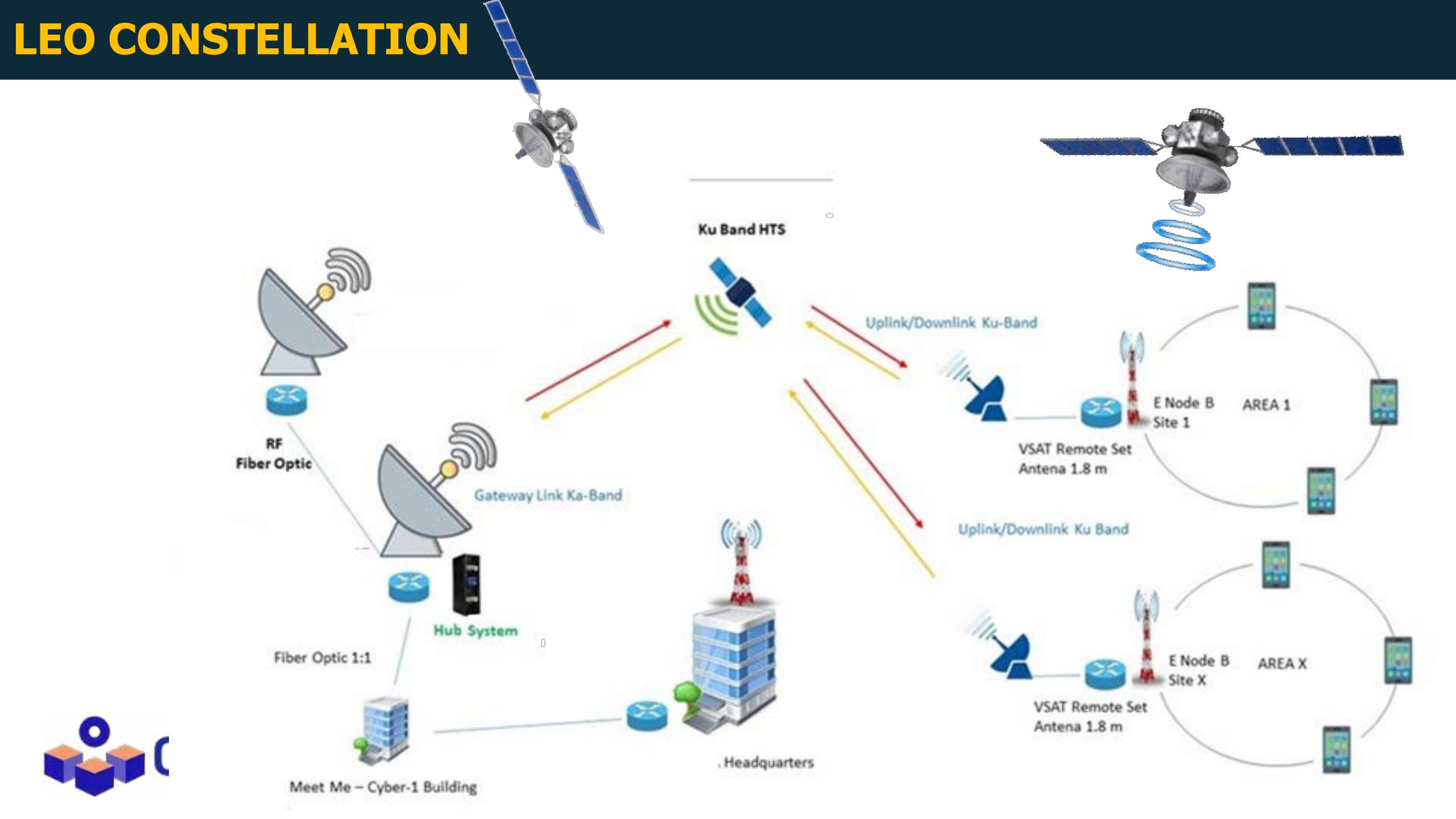
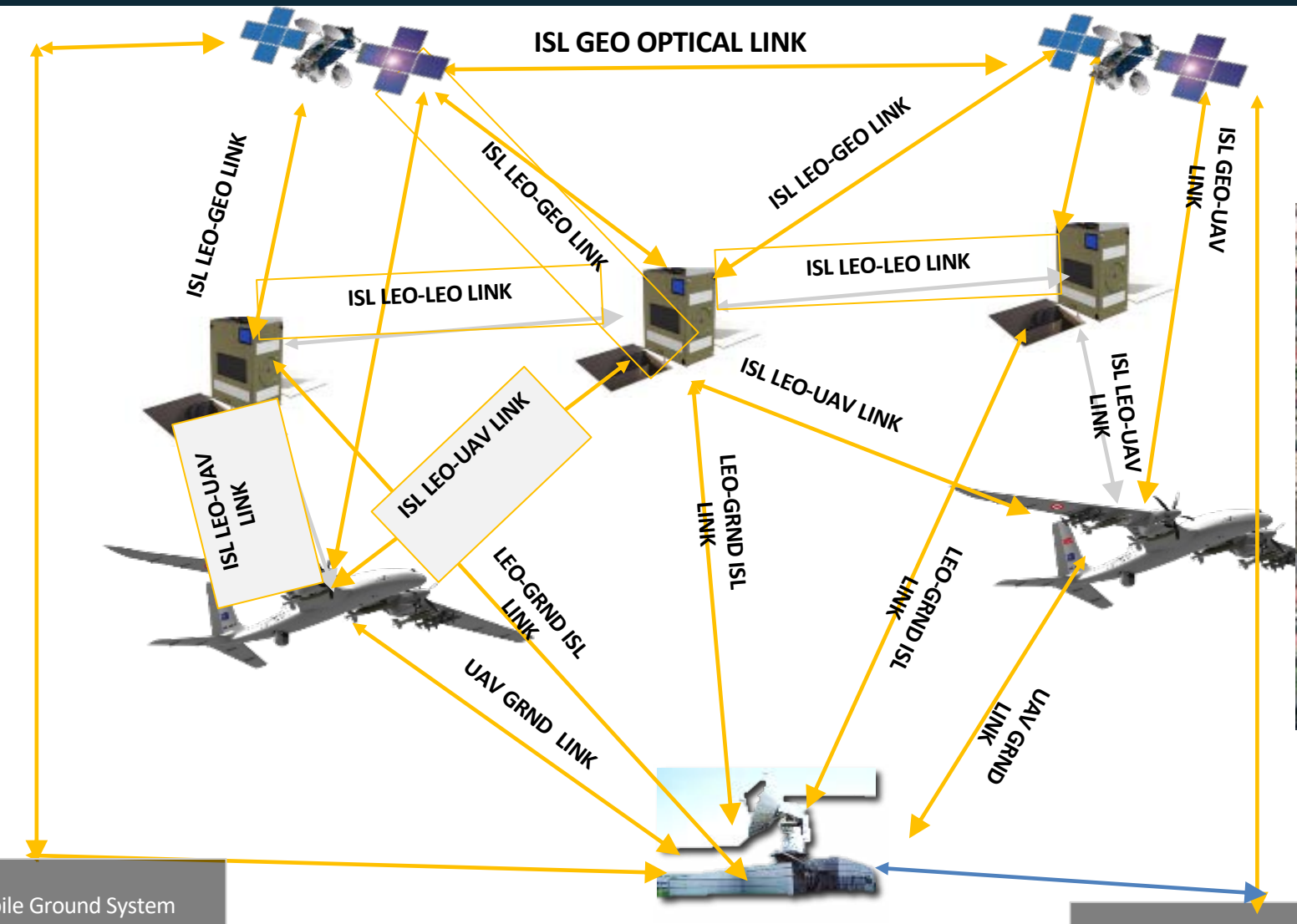
LEO CONSTELLATION



AI-ML



Mobile Ground System

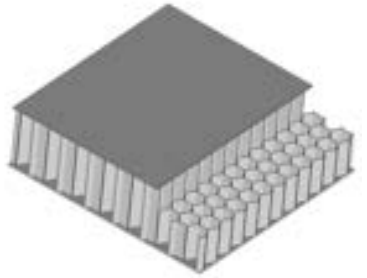
Ground Segment
- Satellite Operations Center (TT&C)
- Primary Reception and Processing Center

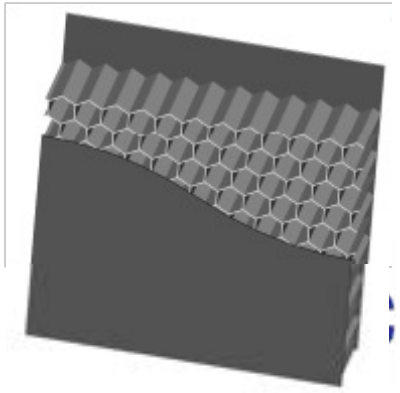
Qstc

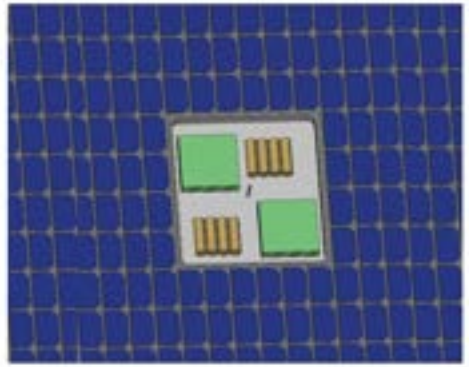
Next Generation

Out-of-the-(CubeSat)-FLATSAT

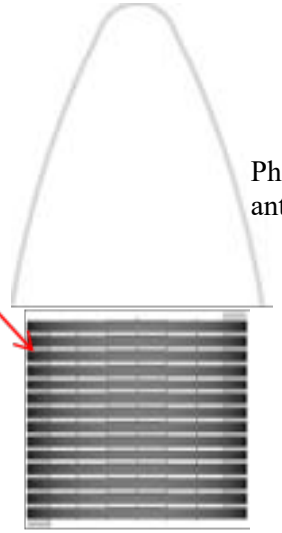
- Efficient shape: thin disk 1 meter+ , 2.5 cm thick
  - *Large surfaee area for power and aperture without depIoyabIes*
  - *VoIume equaI to ~20U+ CubeSat (customized)*
- Stackable for containerization
- Simple construction
  - *Strueture based on composite sandwieh*
  - *Satellite components distributed throughout internaI voIume or in a centraI avionies bay*
- Disk structure - honeycomb-core graphite-epoxy sandwich
  - Choose thickness per mission need
  - Structural mass of 1m flatsat: 2.2 kg for 2.5 cm thickness 3.2 kg for 5 cm thickness
- Satellite bus
  - *Avionics mass ~1 kg*
  - *SoIar eeII and battery mass depends on power requirements; ~2 3 kg*
  - *OptionaI depIoyabIe paneI (for extra power) adds ~2 kg*



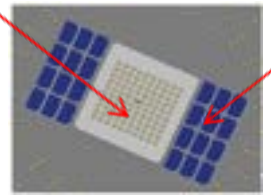




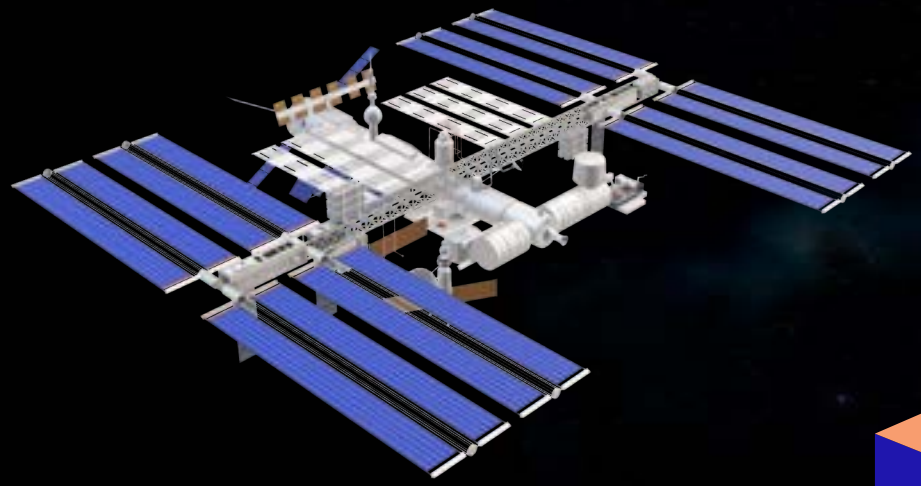
Stack of 14 FlatSats in
1-m-class payload fairing



Phased array
antennas (notional)



Safe-mode
solar cells



THANK YOU

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