D-ORBIT

SPACE R-EVOLUTION

12 November 2018 I Monica Valli COO

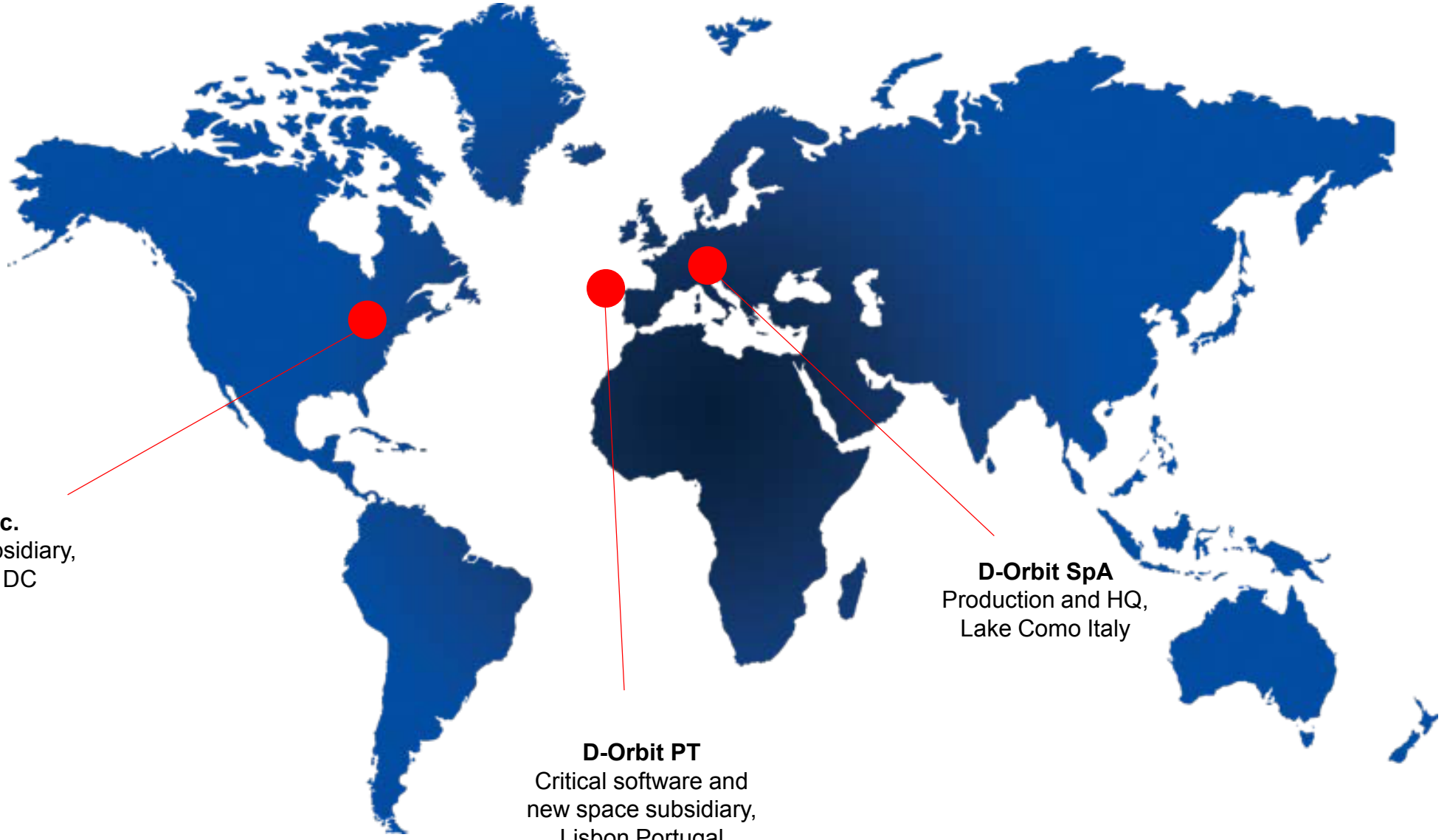
A NEW SPACE RACE HAS BEGUN

THE RAISE OF SMALL SATELLITES

cheaper, faster, easy to update with new technology: ideal for commercial space

82 CONSTELLATIONS: 23,000+ SATELLITES

A GLOBAL COMPANY



D-Orbit Inc.
Commercial subsidiary,
Washington DC

D-Orbit PT
Critical software and
new space subsidiary,
Lisbon Portugal

D-Orbit SpA
Production and HQ,
Lake Como Italy

END-TO-END SERVICES

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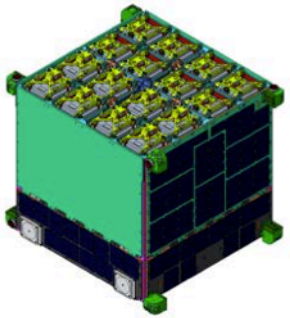
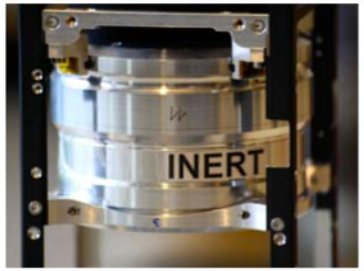
Launch Services, In-Orbit Transportation and precise positioning

Orbital Operations



Satellite Manufacturing



End-of-Life Management

OUR VISION: IN-SPACE LOGISTICS AND WASTE MANAGEMENT

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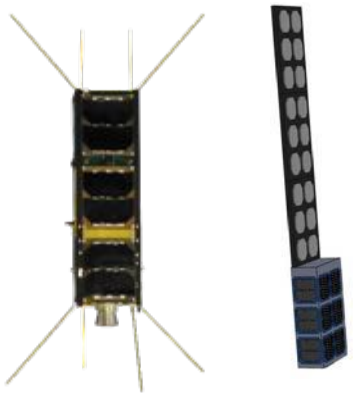
D3, D-RAISE
Commissioning and decommissioning systems: patented, scalable, autonomous, independent, intelligent motors able to remove a satellite even if it is defunct.

D-SAT
Failsafe small satellites for large constellations, self-disposable.

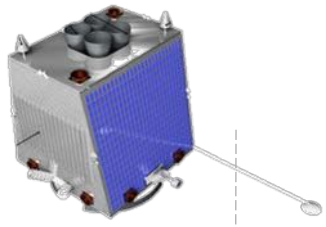


FENIX
Propulsion for cubesat: +60% life extension, 4% volume occupied, plus rapid disposal.

ION
Free-flyer dispenser for precise delivery of smallsats and constellation phasing.

D-Orbit today

IOS
In-orbit Servicing for life extension, monitoring and active debris removal for GEO and LEO large constellations.



D-TRUCK
In-Space Transportation system: raw material, satellite positioning, life extension, people.

$9B market

$200B market

>$200B market


InOrbit
NOW

SELECT YOUR BOARDING PASS: FROM STANDARD TO FIRST CLASS

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CubeSat Mass Allowance

3U, 3U+: 4,5 kg (Standard class) to 6 kg (First Class)
6U, 6U+: 9kg (Standard Class) to 12 kg (First Class)
12U, 12U+: 24kg

CubeSat Integration Sequence

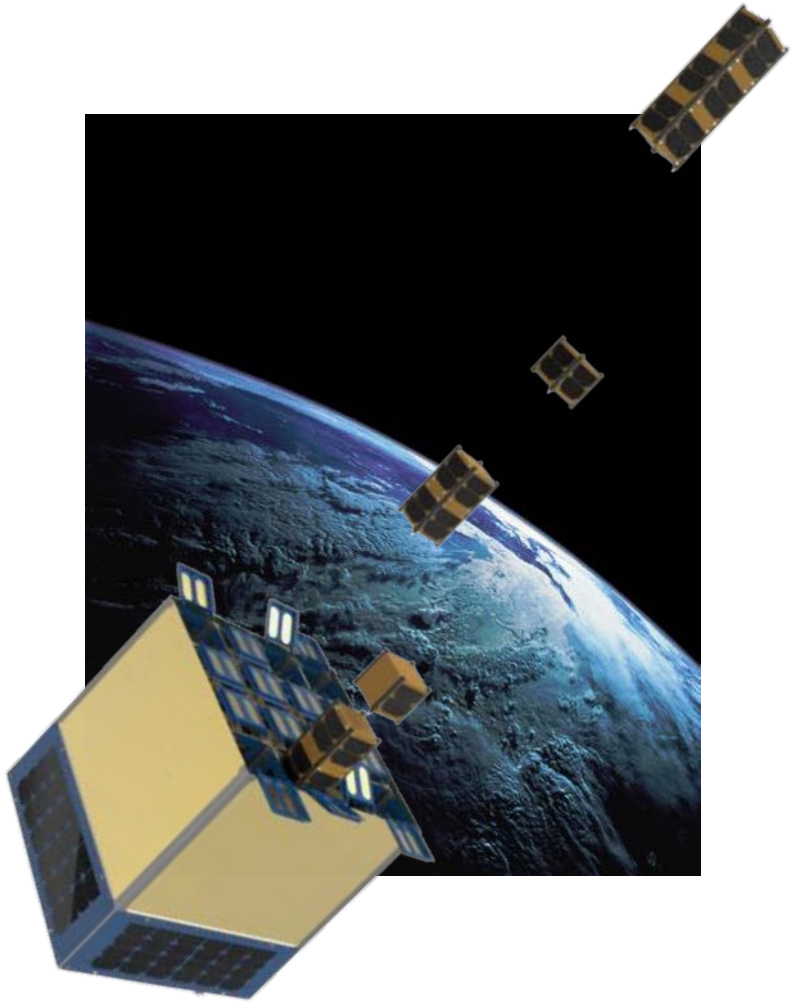
Standard Boarding: CubeSats are the first to be integrated
Late Boarding: CubeSats integrated up to 2 weeks after Standard-Class
Last-minute Boarding: CubeSats may be integrated up to the last day of integration

CubeSat Deployment Sequence

Standard Deployment: within two weeks
Early Deployment: within the first week
First Deployment: within the first day

Access Port Availability

Standard Class : top access port
Business Class: top access and 1-6 lateral access port
First Class : top access port and 2-12 lateral access port



TRUE ANOMALY PHASING – CASE STUDY

Constellation Geometry:

- 500km SSO
- 16 satellites per plane, to be spaced equally. One plane here considered.

	RIDESHARE / DEDICATED LAUNCHES	ION-MK01	ION-MK02
Deployment Approach	Differential drag (1)	Antivelocity deployment, using ADCS for pointing and DPOD springs to provide separation push every 36 hours	16 Propulsive maneuvers for phasing. Low-speed deployment from DPOD.
Time to deploy	**Up to 8 months (1)**	**3 months (2)**	**1 month**
Tot Launch & Deploy cost	Rideshare/dedicated launches cost.	Similar Cost	Similar Cost

50% to 86% reduced time from launch to full operation, at about the same cost

(1) Phasing executed by CubeSats through differential drag

(2) Deployment time can be further reduced

RAAN (LTAN) SHIFT – CASE STUDY

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Constellation Geometry:

- 500km SSO
- 8 planes, equally spaced and 16 satellites per plane

	RIDESHARE LAUNCHES	DEDICATED LAUNCHES	ION OPTION 1 (SINGLE LAUNCH)	ION OPTION 2 (2 RIDESHARE LAUNCHES)
Deployment Approach	n/a (3)	Direct launch to each plane	IONs used to perform LTAN shift, then decommissioning.	2 launches on common LTAN and perform LTAN shifting through ION platforms.
Time to deploy		**24 months (2) , excluding phasing**	**Up to 8 months (1)**	**Launch 1: Up to 6 months** **Launch 2: Up to 6 months**
# Launches		8	1	2
Tot Launch & Deploy cost		Dedicated launches cost	16% lower cost	25% lower cost

66% to 75% reduced time from launch to full operation, at 16% to 25% lower cost

(1) Phasing executed by CubeSats; (2) Assuming one launch per quarter; (3) Not possible to deploy on all LTANs using simple rideshare

ORBIT RAISE – CASE STUDY

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Constellation Geometry:

- 1200km SSO
- 6 planes, equally spaced and 8 satellites per plane

	RIDESHARE LAUNCHES	DEDICATED LAUNCHES	ION (2 RIDESHARE LAUNCHES)
Deployment Approach	n/a (2)	Direct launch to each plane (limitation of microlaunchers on reaching higher altitudes).	2 launches on common LTAN and perform orbit raising and LTAN shifting through ION.
Time to deploy		**18 months (1), excluding phasing**	**Launch 1: up to 7,5 months. Launch 2: up to 7,5 months**
# Launches		6	2
Tot Launch & Deploy cost		Dedicated launches cost	**38% lower cost**

58% reduced time from launch to full operation, at 38% lower cost

(1) Assuming one launch per quarter; (2) Not possible to deploy on all LTANs using simple rideshare , no rideshare available at 1200km

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NEW SPACE SOLUTIONS

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