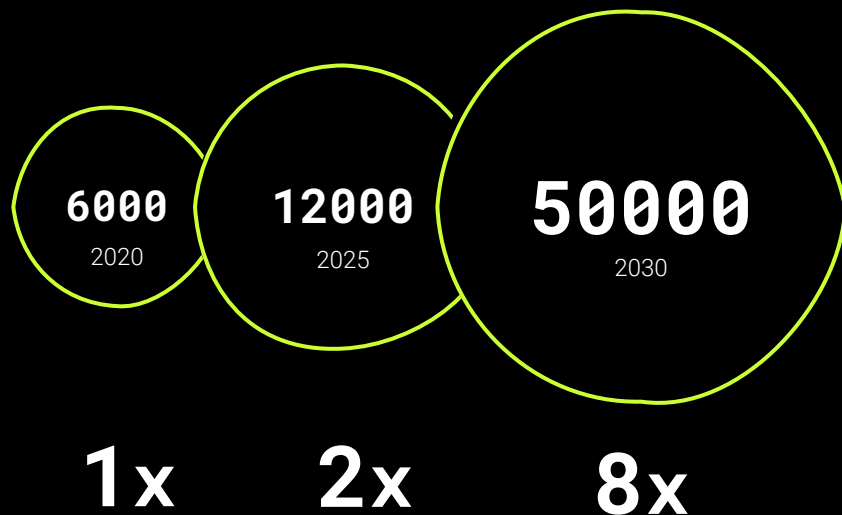# > ecosmic

On a mission to scale satellites' software infrastructure - starting from Space Traffic Management

Benedetta M. Cattani

CEO & CTO

More and more active satellites

6000
2020

12000
2025

50000
2030

1x   2x   8x

⚠️ We are lacking the infrastracture to scale

A problem we have seen before

In-House Data Centers

→

Cloud Computing Services

Google Cloud   aws

> High CAPEX & OPEX
> Dedicated people
> Integration complexity

> Use-as-you-need mindset
> No infrastructure to maintain
> Higher service availability

`20 years ago`

`Today`

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Unlock the
super power
to scale

Our solution for Space

Monolithic architecture

→

5x
satellites
(by 2030)

Microservices for space

- Custom software for each mission
- Patchwork software solutions
- High number of FTEs required per satellite

- Build your own operations system
- Fine grained services
- Independently deployable solutions

Today

WIP

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Starting from Space Traffic Management

> **130,000,000** space debris in LEO

Mega constellations

Need for best of breed SW to reduce workload

> Up to 30'000 Conjunction Alerts/year*
> 99,9% of alerts are false positives
> 3 days/week** spent on STM related ops

New space scale-ups

Need for easy to integrate SW to comply with new rules

> Dedicated FTEs needed for in-house solution
> Lack of domain expertise
> Lack of visibility on the risk

*Average of 500 CDM/sat/week for a constellation of 600 sats
**Per FTE in a Fligh Dynamics team

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Technical challenges

Only 0.4% of the objects >1 cm are tracked

There are limits to the minumum size of objects that we can track from ground

More than >99% of the collision warnings received by satellite operators today are false alerts

Low quality of the data available and of the algorithms that are used result in low accuracy of the results

Operators often do not optimise manoeuvers and struggle to coordinate

There is no unified way to coordinate with other operators

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Operational challenges

Trade-off between public and private data providers

Compliance with institutional requirements

Manual data injection

Complex data manipulation

Simplified risk estimation analysis

Disruptions in manual operations

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Object Tracking

Risk Metric Estimation

Collision Avoidance Manoeuver Planning & Execution

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What's new?

Traditional Methods

> safe

Uncertainty propagation

Gaussian uncertainty

Linear uncertainty propagation

Enhanced uncertainty model

Non-linear uncertainty propagation
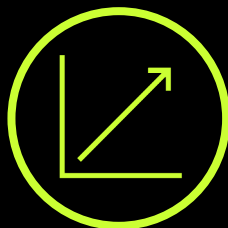
Encounter geometry

Linear encounter

Spherical bodies
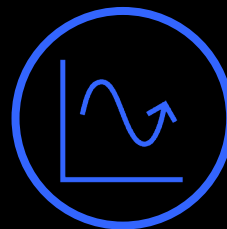
No encounter assumptions
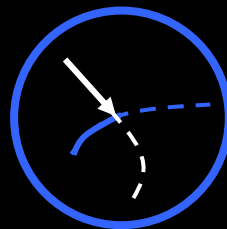
Realistic shape approximation

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SAFE Visualisation

Traditional Algorithms

> safe

SAT B
(ts)

SAT A
(ts)

SAT A
(to)

SAT B
(to)

SAT B
(ts)

SAT A
(ts)

SAT A
(to)

SAT B
(to)
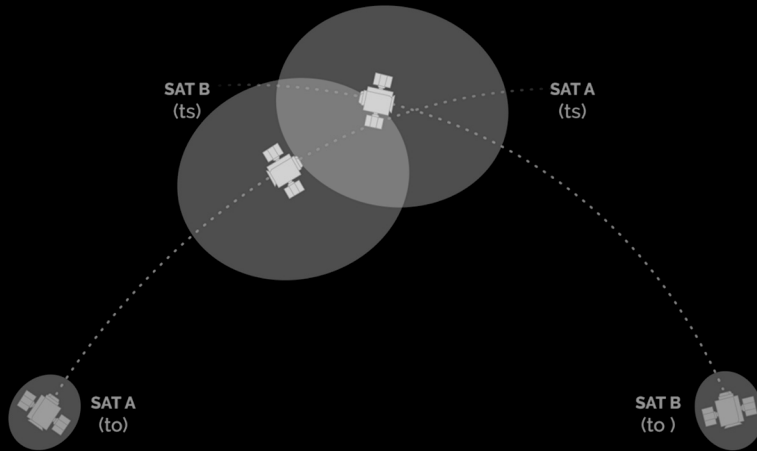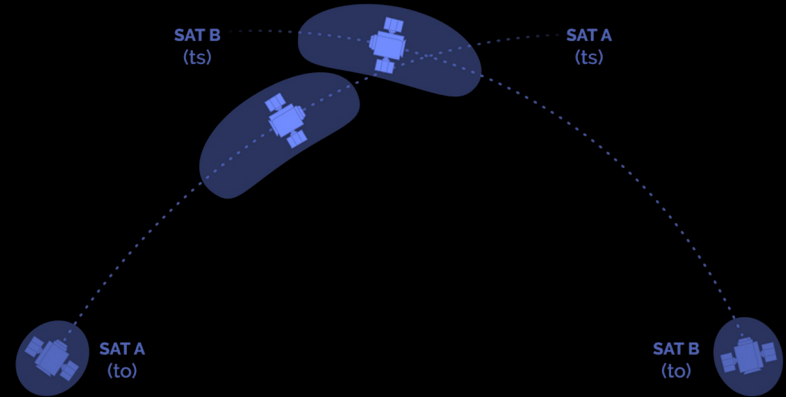
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Achievements

Ecosmic was
founded in the NL
Jan — 2023

European
Council Grant
SAFE IOD
July - 2023

1.1M€
Pre-seed Round
Apr — 2024

Beta testing program

May - 2023

PoC with
Telespazio

Dec - 2023

Opening Italian
HQ

Oct - 2024

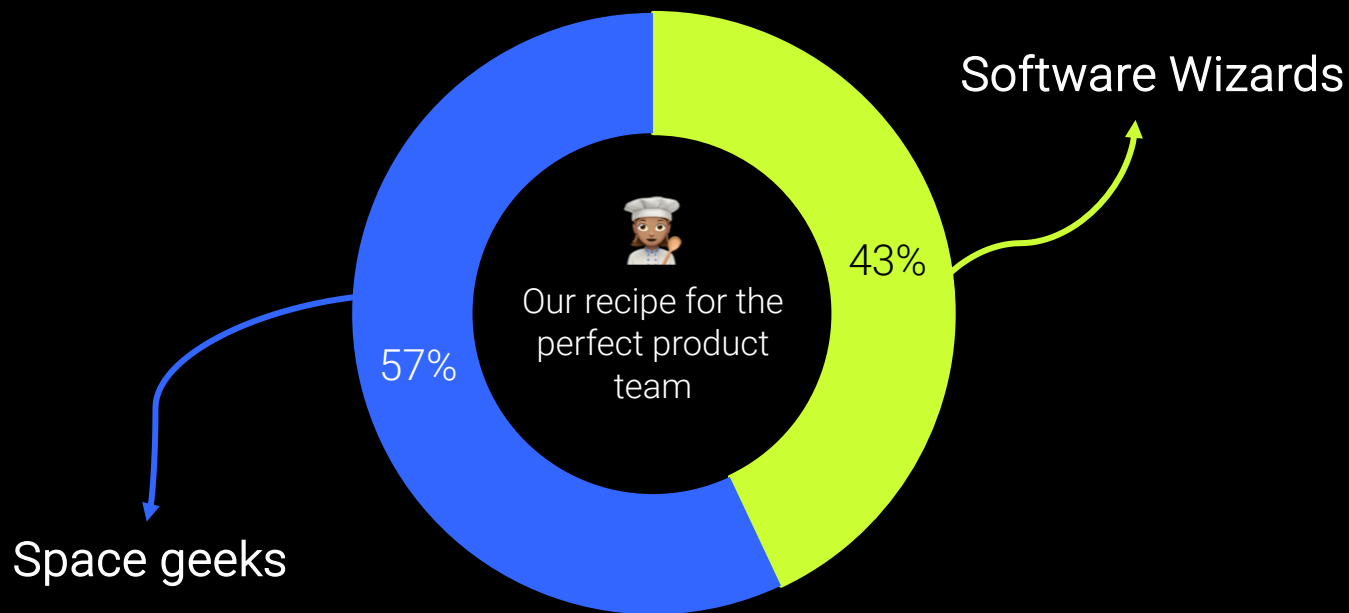Launch of
SAFE

GREENTECH
Europe 2023
village capital

CASSINI
Business Accelerator

TELESPAZIO
a LEONARDO and THALES company

eesa
business
incubation
centre
Turin

PRIMO
SPACE

CREATIVE LAB
DESTRUCTION

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We are high-tech to the core

Software Wizards

43%

Our recipe for the perfect product team

57%

Space geeks

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JOIN OUR BETA - TESTING PROGRAMME

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