

Futuro de las comunicaciones satelitales

Jornada Retos de las comunicaciones satelitales

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EUROPEAN SPACE AGENCY



Space is already a daily and strategic infrastructure

EVERYDAY

Space services converted into a commodity

Connectivity

Navigation and Timing

Observation and data

STRATEGIC

Geopolitics elevates space to priority

Autonomy

Resilience

Technological sovereignty

The same infrastructure must serve the economy and protect strategic interests.

Images • signals • environmental
and operational data

Edge computing and AI transform data into decisions

Multi-orbit nodes deliver communications and services everywhere

Multi-service • Interconnected • Software-defined



+25% Year-over-Year

in 2025

+58% Year-over-Year

Source: ESA report of the space economy 2026

European and global supply may be insufficient from 2029 onwards.

The window to secure access, cadence, and launch resilience is now.

Capital accelerates scale, consolidation and verticalization

€120B

Public space expenditure · 2025

54% defence

€12B

Space venture funding · 2025

€5B Launch · €3B Satellite Manuf.

SCALE

to close
the business case

CONSOLIDATE

M&A to accelerate development

VERTICALIZE

Large-scale production and
lower cost

COOPERATE

Joint ventures MNO + satellite
operators

Why industry needs ESA now more than ever

€7.7B

ESA budget · 2025

6.5%

of global space public expenditure

57%

of European public space expenditure

STRATEGIC PARTNER

01 DE-RISK

Matures high-risk technologies through technical expertise, co-funding and in-orbit validation

02 CONNECT

Federates industry, start-ups, research, operators and institutions across the full value chain

03 ACCELERATE

Bridges the gap from R&D to products, missions and operational services

04 STRENGTHEN

Builds European competitiveness, autonomy and sovereignty

ESA turns innovation into capability — and capability into European competitiveness.

Telecom and beyond – A rapidly expanding service portfolio

BROADBAND

DIRECT-TO-DEVICE

SPACE BACKBONE

SPACE DATA CENTRES

PNT

GROUND & SPACE SURVEILLANCE

IN-ORBIT SERVICE & DEBRIS REMOVAL



Technological challenges

01 AFFORDABILITY & SCALE

Few-million-euro satellite target to close constellations business cases

Design for manufacture and industrialisation to enable large scale production

02 TECHNOLOGICAL SOVEREIGNTY

Master critical technologies: very large phased arrays, on-board processing, chips and semiconductors, optical communications, quantum computing, cybersecurity and “pancake” stackable satellites, AI

03 INTEROPERABILITY BY DESIGN

Seamless space-terrestrial integration through common standards for communications, PNT, inter-satellite links, data switching & routing in space

ESA ARTES TELECOM FUNDING (€1.5B)

**products · end-to-end systems ·
constellations · industrialization**

(AUTC

IN-ORBIT RESILIENCE

Autonomy to detect, decide,
recover and reconfigure

Direct-to-Device (D2D) enters a global race for spectrum and time to market

2028

**critical window of
time-to-market**

The advantage begins with
securing MSS spectrum

SPECTRUM

Multibillion-dollar acquisitions
and agreements

ARCHITECTURE

Space cell towers

PROTOCOL

3GPP 5G/6G NTN

AFFORDABLE CONSTELLATION



**Partnerships share costs and
federate interoperable layers**



**ESA ARTES ELEOSYS & SELYCE
ESA IRIS² LOW-LEO SELENE**

**D2D projects at early phase of development with big
opportunities for European industries**

Broadband requires competing in scale, cost and autonomy



(credit Eutelsat OneWeb)

NEXT TECHNOLOGICAL FRONT

- 1 Phased arrays** Ku · Ka · Q/V
- 2 On-board processing** 5G/6G NTN · PNT
- 3 Intersatellite links** extended coverage · reduced ground segment · government services
- 4 Constellation AI** autonomy · health monitoring · resource optimization

ESA Sunrise · OneWeb next-gen commercial constellation

Space backbones and data centres: connectivity and computing in orbit

SPACE BACKBONES

Ultra-high speed and secure connectivity in space

100 Gbps packet switching, Tbps
inter-satellite links, 1000's
automatic connections per day

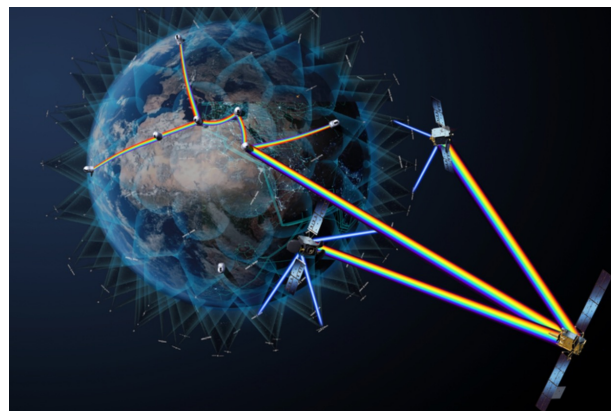
ESA HYDRON, AIDAN NEXT, PIONEER, Scylight

SPACE DATA CENTRES

AI shifts processing and decisions into orbit

Constraints on Earth: power grid, water and local zoning laws

Orbital CPUs and GPUs bring high-performance computing and decisions close to data, reducing latency, downstream traffic and reliance on terrestrial infrastructure

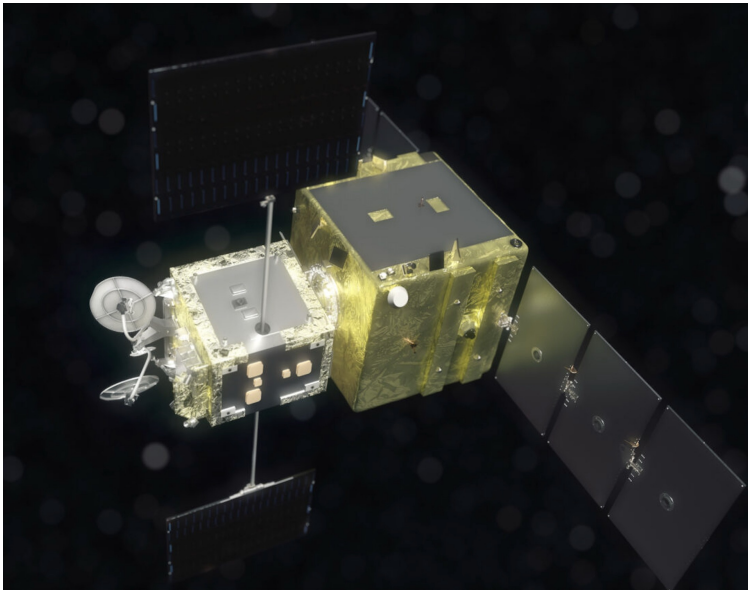


In-orbit services turn sustainability and lifetime into a market

REMOVE

Active debris removal in LEO

Driven by the growth of constellations



ESA · ELSA-M (credit Astroscale UK)

EXTEND

Life extension of GEO satellites

Driven by asset value and continuity of service



ESA · Phoenix (credit ClearSpace)

Europe must now scale a sovereign space infrastructure

- 01 SPACE IS ALREADY INFRASTRUCTURE** daily life, criticality and geopolitics
- 02 SCALE CHANGES THE MODEL** constellations, industrialization and launch access
- 03 THE NETWORK MUST BE INTEROPERABLE** multi-orbit, 5G/6G NTN and distributed processing
- 04 ESA IS THE EUROPEAN CATALYST** de-risk, accelerate and strengthen autonomy

DECISION

Invest now in capacity, sovereignty, and integration to lead the next layer of communications.