ARTES

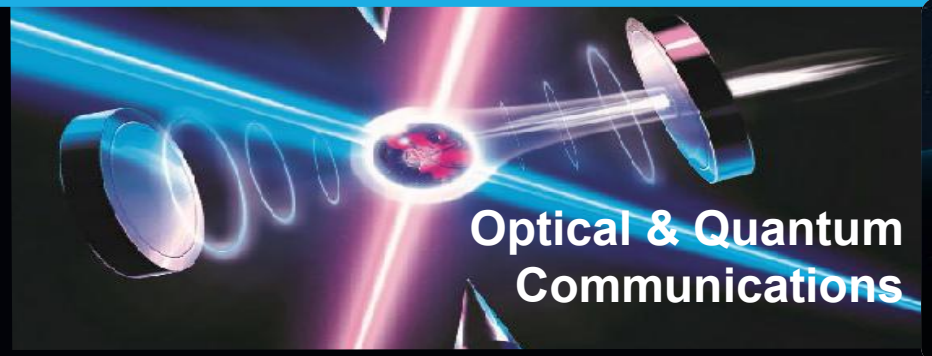
Developing the Future of Satellite-Enabled Telecommunications

Industry Space Days – ESTEC 17 September 2026

EUROPEAN SPACE AGENCY

Satellite Communications has a major role to play...

Critical Technology & Products Innovation & Autonomy



Optical & Quantum Communications

Secure, Ubiquitous Connectivity

Constellations and multi-orbit

Direct-to-Device Connectivity

Spectrum Sustainability

TN–NTN Integration

Industrialisation

Resilient Satcom Infrastructures for Critical Applications

Connectivity Programmes: ARTES 4.0

ESA's programme of Advanced Research in Telecommunications Systems (ARTES) fosters innovation to enable the European and Canadian space industry to succeed in highly competitive global markets.

Generic Programme Lines:

- Future Preparation
- Industrial Competitiveness

Strategic Programme Lines:

- Optical & Quantum Communications (ScyLight)
- Space for 5G/6G
- Space Systems for Safety and Security (4S)

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ARTES - ESA's Telecom and Satcom Programme

Reinforcing European Satcom Leadership · Driving the Global Space Economy

ARTES 4.0

- **5G/6G Connectivity Direct-to-Device (D2D)**
  - Providing seamless connectivity everywhere, anytime, to everyone via terrestrial and satellite networks integration
- **Optical and Quantum Communications**
  - Ultra-fast and secure data exchange with laser and QKD technology
- **Space Systems for Safety and Security (4S)**
  - Safety and Surveillance in Maritime & Aviation
  - Enhancing Cyber Security in space
- **Industrial Competitiveness**
  - Support competitiveness European and Canadian industry
  - Boost industrialisation and reduce time-to market
- **Future Preparation**
  - Market intelligence, consolidating roadmaps and future projects

THE ARTES TOOLBOX

STRATEGIC

GENERIC

=

INDUSTRIAL COMPETITIVENESS

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Future Preparation

Generic Programme Line – Programme Activities

- The long-term viability and independence of European industry is linked to proactive development of innovative solutions and capabilities.
- FP assists ESA and Member States in identifying, defining, and initiating new activity, whilst providing information to industry and institutions on the future strategic development needs of the satcom sector.
  - Prepare connectivity programmes for CM28, Strategic Programme Lines and activities.
  - Provide Market Intelligence on status and future evolution of the global satcom sector.
  - Monitor spectrum access and standardisation efforts.

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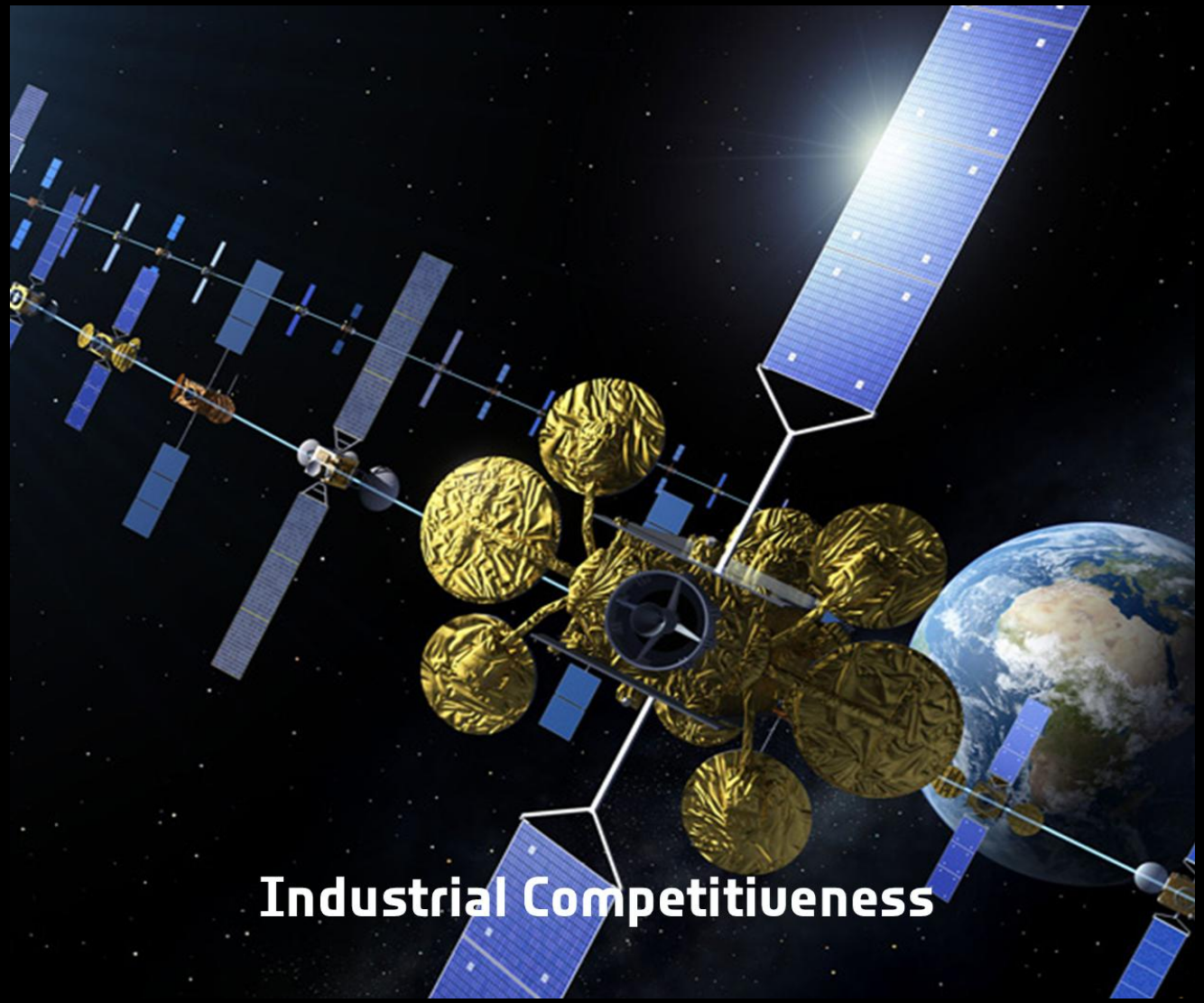
Industrial Competitiveness

Generic Programme Line – Programme Activities

- Harmonised, simplified, and accelerating ARTES 4.0 to improve European competitiveness in the global space market. Implements ESA and Industry-initiated Technology and Products development activities and larger-scale Partnership Projects.
- Focus and federate key product roadmaps, inter-operability and standardised solutions.
- Innovate and boost end-to-end systems, in-orbit experimentation / demonstration, and industrialisation. Prepare next gen multi-orbit constellations.
- 2026 Advanced Technology Work Plan published and Calls for Proposals (industry-initiated)



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Industrial Competitiveness

Generic Programme Line – Partnership Projects -PHOENIX

- In-Orbit Services (IOS) area strategic enabler for resilient, sustainable, and space operations.
- Satellite life extension represents a near-term and high-value commercial opportunity.
- Phoenix positions Europe at the forefront of the emerging IOS market through the demonstration of a GEO life-extension service.

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5G/6G and Sustainable Connectivity

Strategic Programme Line – Programme Activities

- 5G/6G activities enable European-wide sustainable competitive connectivity through:
  - Scalable 5G/6G NTN technologies
  - Strengthening industrial competitiveness
  - Accelerating deployment of integrated TN-NTN solutions.
- Provides a long-term vision for terrestrial-non-terrestrial (TN-NTN) convergence, 5G/6G standardisation, NTN forum, D2D, in-orbit labs + 5G/6G hubs.
- 2026 Work Plan published and Call for Proposals (industry-initiated) with focus areas (e.g. AI for NTN, automotive/mobility, JCAS for 6G, D2D developments and IOD/IOV and terminals)

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Space Systems for Safety and Security (4S)

Strategic Programme Line – Programme Activities

- Communication and surveillance systems for air & maritime traffic management and safety. Deliver critical infrastructure by 2030, in partnership with industry and all major European stakeholders in these domains.
- Satcom R&D, products/solutions for cybersecurity, including delivering – for the firs time – testbeds to assess and mitigate in-orbit threats to satcom systems.
- CleanWaves for RF Spectrum monitoring - R&D and demonstration
- GOVSATCOM Entrusted Tasks.
- 2025 Work Plan, 2026 Work Plan published and Calls for Proposals (industry-initiated)

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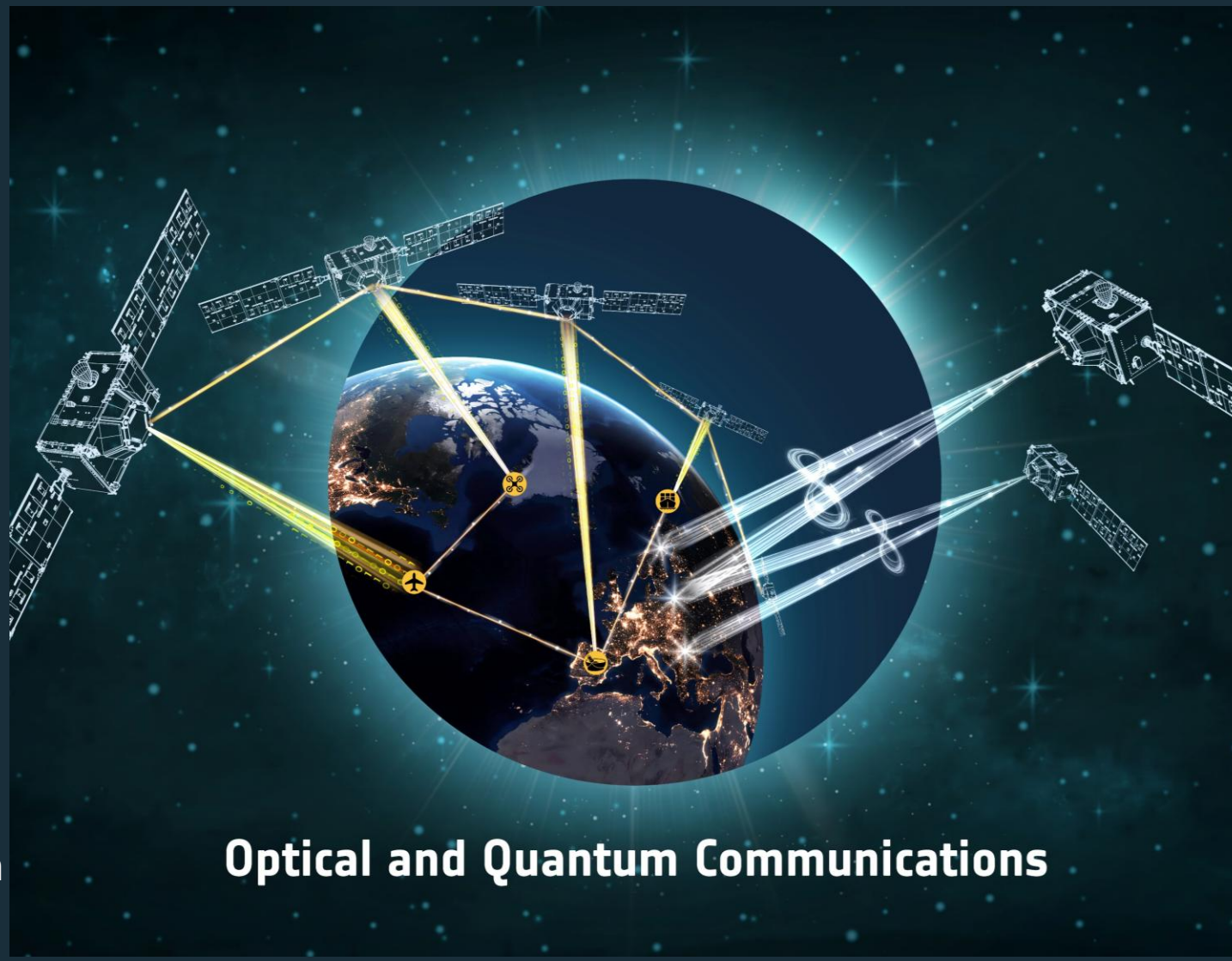
Optical and Quantum Communications - ScyLight

Strategic Programme Line – Programme Activities

- All optical and quantum communications activities grouped under this SPL.
- Continue to boost ecosystem in Europe and Canada, welcoming new players, and mature both technology and industry.
- Start Quantum Information/Entanglement Networks (QIN) with QUASAR. Studies on HydRON evolutions for HAPS, maritime, and multi-Terabit/s. Development of Optical non-terrestrial Network (O-NTN) and high-throughput backbone network features. Industry engagement with ESTOL continues.
- Rolling Work Plan 2021-2026 published covering optical, photonics and quantum tech and Calls for Proposals (industry-initiated)



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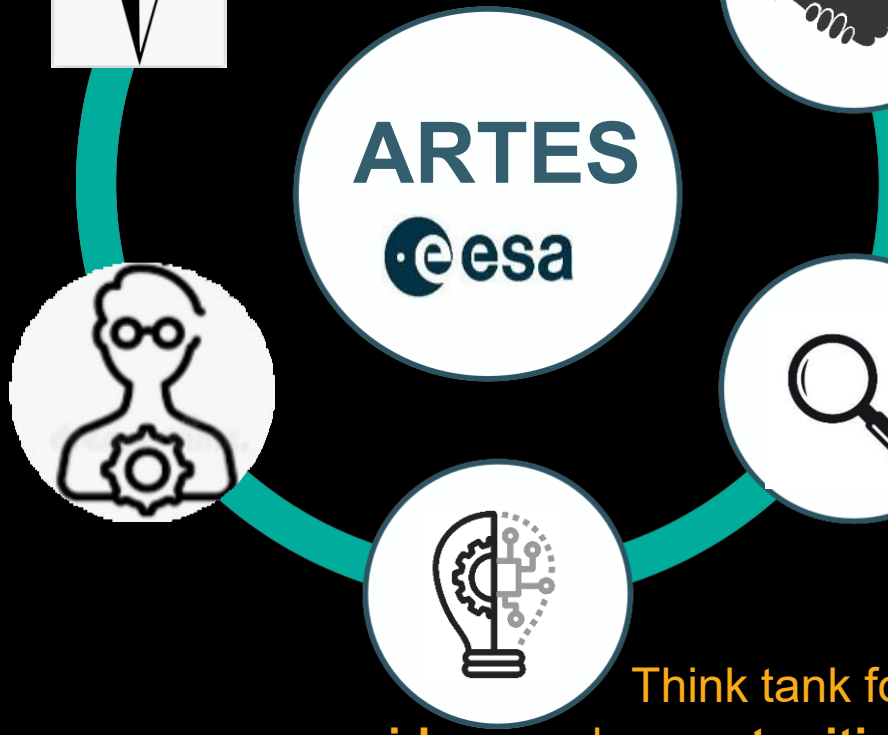
ARTES 4.0 Added Value

Makes **funding** available

Guides you to the most suitable programmatic tool



Facilitates **synergies and cooperation** among Industry

Independent assessment and technical **expertise**

Full **transparency**, **confidentiality and fairness**

Think tank for **ideas** and **opportunities**

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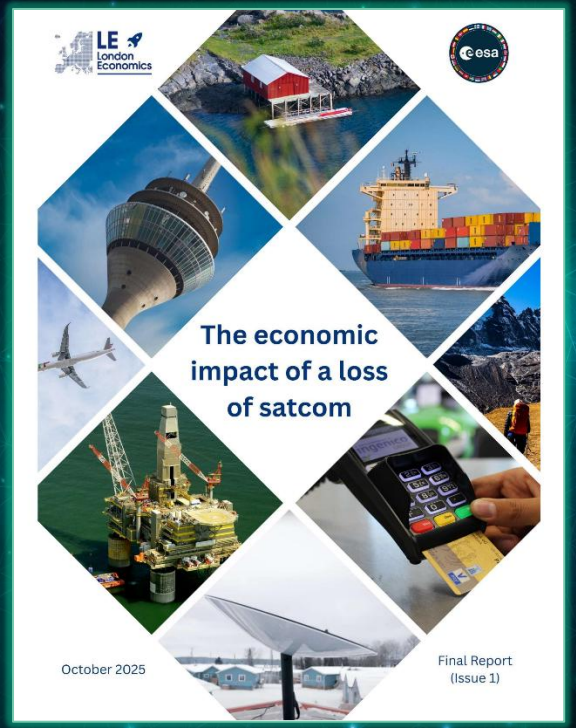
Economic Impact of a Loss of Satcom
in ESA Member States



London Economics · ESA

WHAT IF... ESA Member States lost satcom for a week?

UP TO €19B lost for shipping

The absence of satellite safety services leads to loss of economic activity tied to maritime transport, with knock-on effects to the supply chain numbering in the billions

UP TO €559M lost for aviation

Loss of satellite service leads to 4,000 transatlantic flight cancellations and industry-wide increase in emissions by 200,000 tonnes of CO_2, costing up to €558.7 million

UP TO €90M lost for energy

With no satellite communications, key energy infrastructure is paused, including offshore rigs, incurring a loss of up to €90 million

ESTIMATED €353M lost for consumer services

2.2 million (935,000 households) people in ESA MS' risk going completely offline with no internet or connectivity

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• Socio-Economic Impact (SEI) Assessment
• Measuring the benefits of ARTES 4.0 (2020 – 2026)

€3.5bn
Value of Exports

118
Patents filed

2,937
Partnerships

2,870
Jobs created

€766M
Industry Co-funding

Data across programmes has been harmonized to measure the **socio-economic impact** of the ARTES 4.0 programme along **quantitative indicators**.

The indicators reveal how **€1.2Bn** in **ESA funding** and strategic support have fostered a **dynamic, competitive**, and **collaborative space ecosystem** across Europe.

Last Updated: September 2026
Database of 485 industry project questionnaire responses does not represent all ARTES 4.0 activities in that period.

Definition of Indicators

Exports captures the total value of sales outside the domestic market, including within other ESA Member States and globally.

New Patents tracks the number of patents filed as a result of ARTES 4.0 activities, showcasing technological advancements and the creation of new intellectual property.

Partnerships Developed records new business relationships formed through ARTES 4.0, including consortium partners, suppliers, and distributors.

Job Created quantifies jobs created and sustained through ARTES 4.0, showing the programme's contribution to employment and long-term industry growth.

Industry Co-Funding reflects private investment attracted through co-funded ARTES 4.0 activities.

How to work with us...

Website

How to work with us

LinkedIn

Commercialisation Website

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THANK YOU!