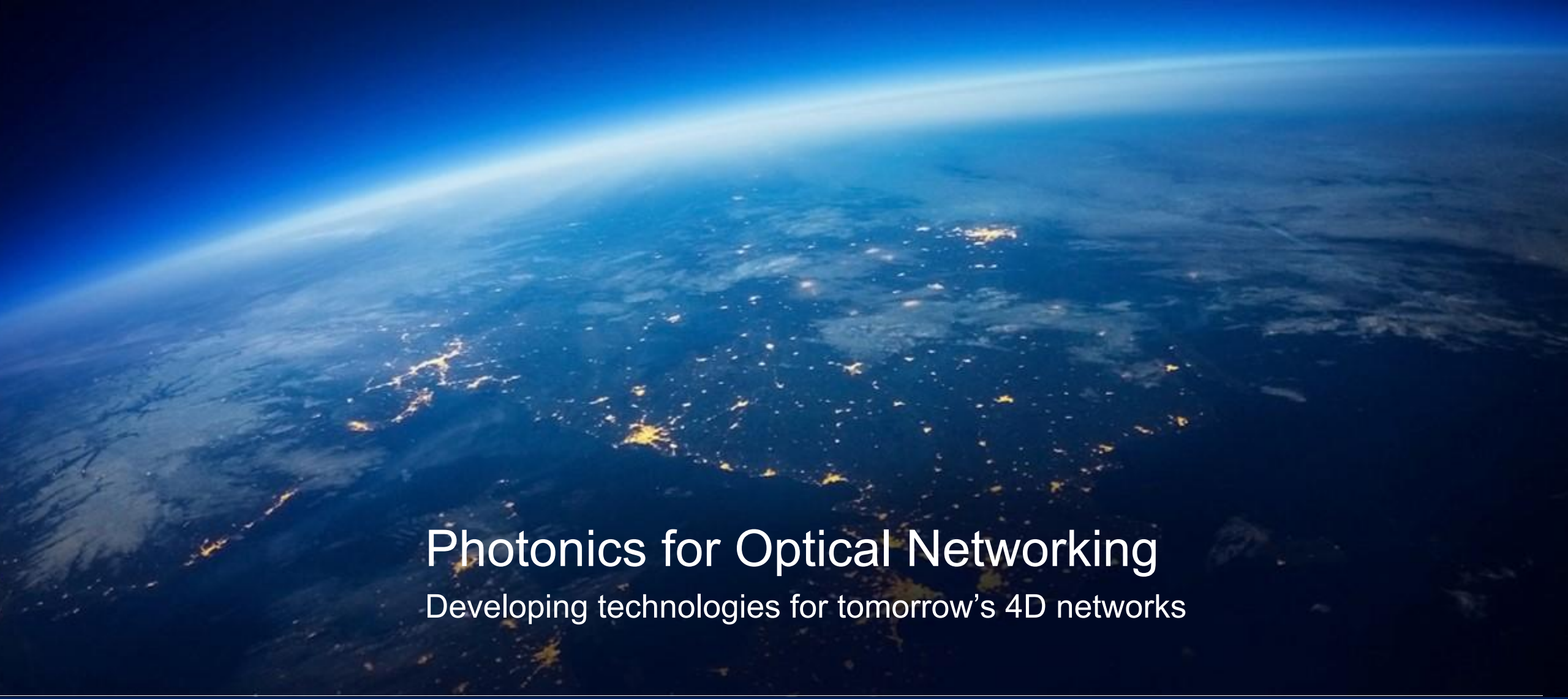


Photonics for Optical Networking

Developing technologies for tomorrow’s 4D networks

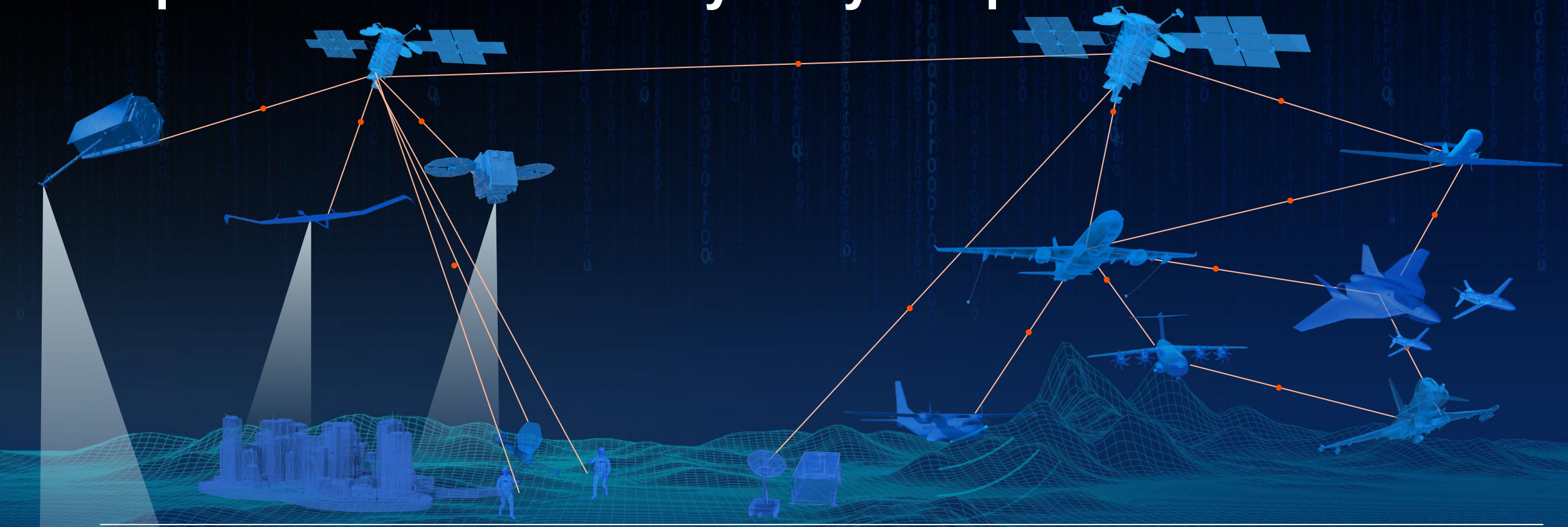
DEFENCE AND SPACE

Kevin Shortt

24 June, 2025

AIRBUS

Our portfolio: From the sky to cyberspace



Our customers solve **complex challenges** of today and tomorrow – with our platforms, systems and services.

AIRBUS

Central Research & Technology (CRT)

Mission

Central R&T pioneers the future of aerospace by exploring and delivering ambitious new technologies for the next-generation portfolio of Airbus and its divisions in collaboration with leading academic and scientific institutions.

Axes

Acting as tech trailblazers

Explore and deliver relevant new technologies.
De-risk, create new opportunities.

Shaping the skills of tomorrow

Build internal capabilities on emerging strategic technologies.
Provide relevant expertise to internal customers for technical support and decision-making.

Expert Booklet

Strategic drivers

Sustainability

Pioneer new solutions for decarbonization, lifecycle, circularity, energy sources and propulsion.

Safety

Enhance the product safety and reliability.
Advance solutions for next-generation defence & security.

Operational Excellence

Push novel technologies for design and production activities, product operations and to improved customer experience.

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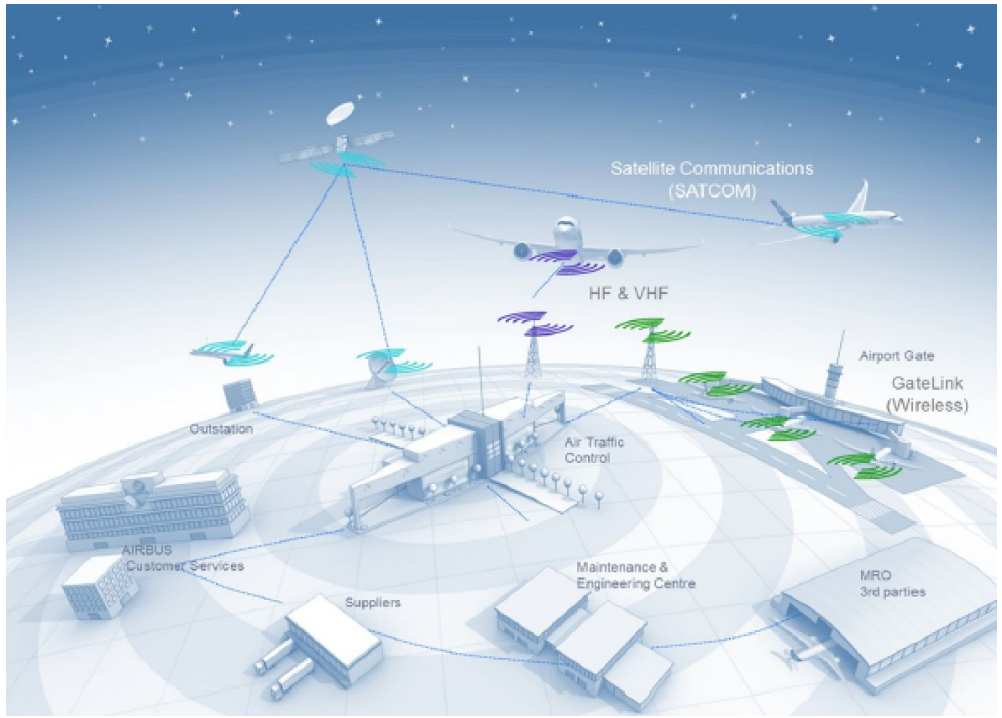
Airbus Connectivity

Connectivity is more than communication, radios and networks…

… it is the **enabler** to link our products to individual terminals, mobile devices, sensors, computers and clouds.

… it is the **enabler** to provide new services to our customers.



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Non-Terrestrial Optical Network

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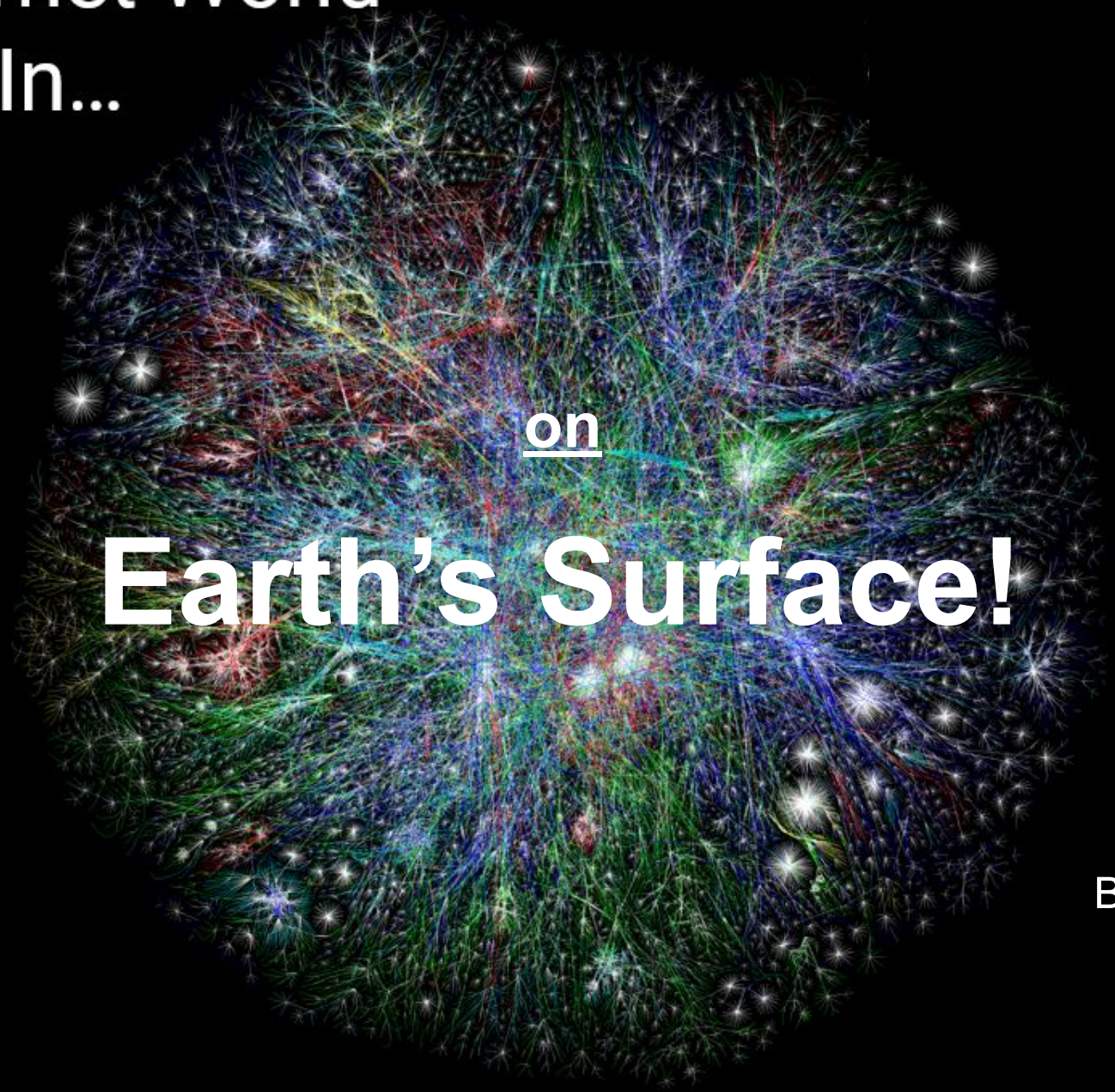
The Internet World We Live In...



on

Earth's Surface!

Access to exabytes of data...

Livestreaming/Real-time data at the touch of a button...

Connected to billions of people...

But all this exists...

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But what about **BEYOND**
Earth’s surface?
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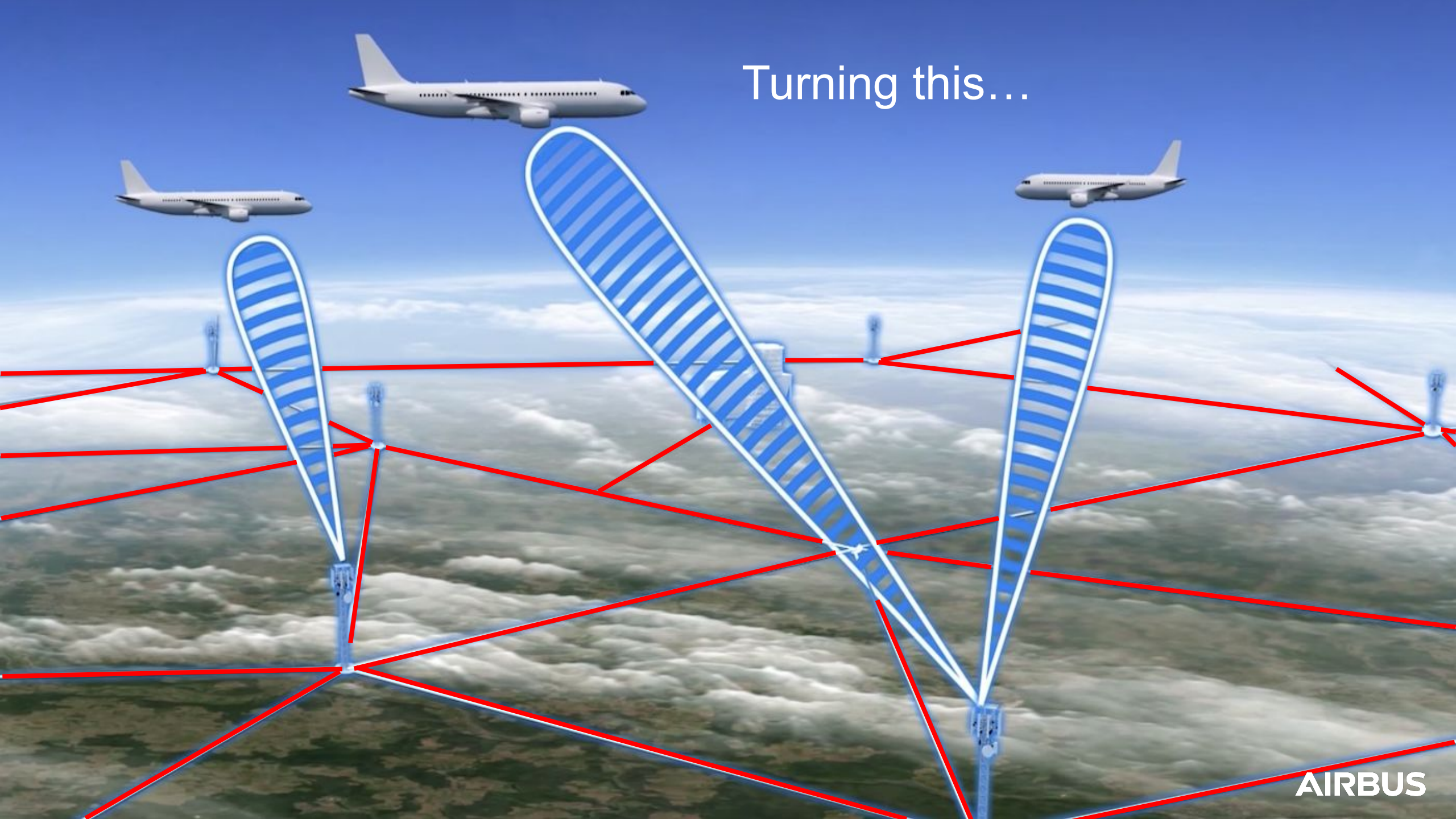
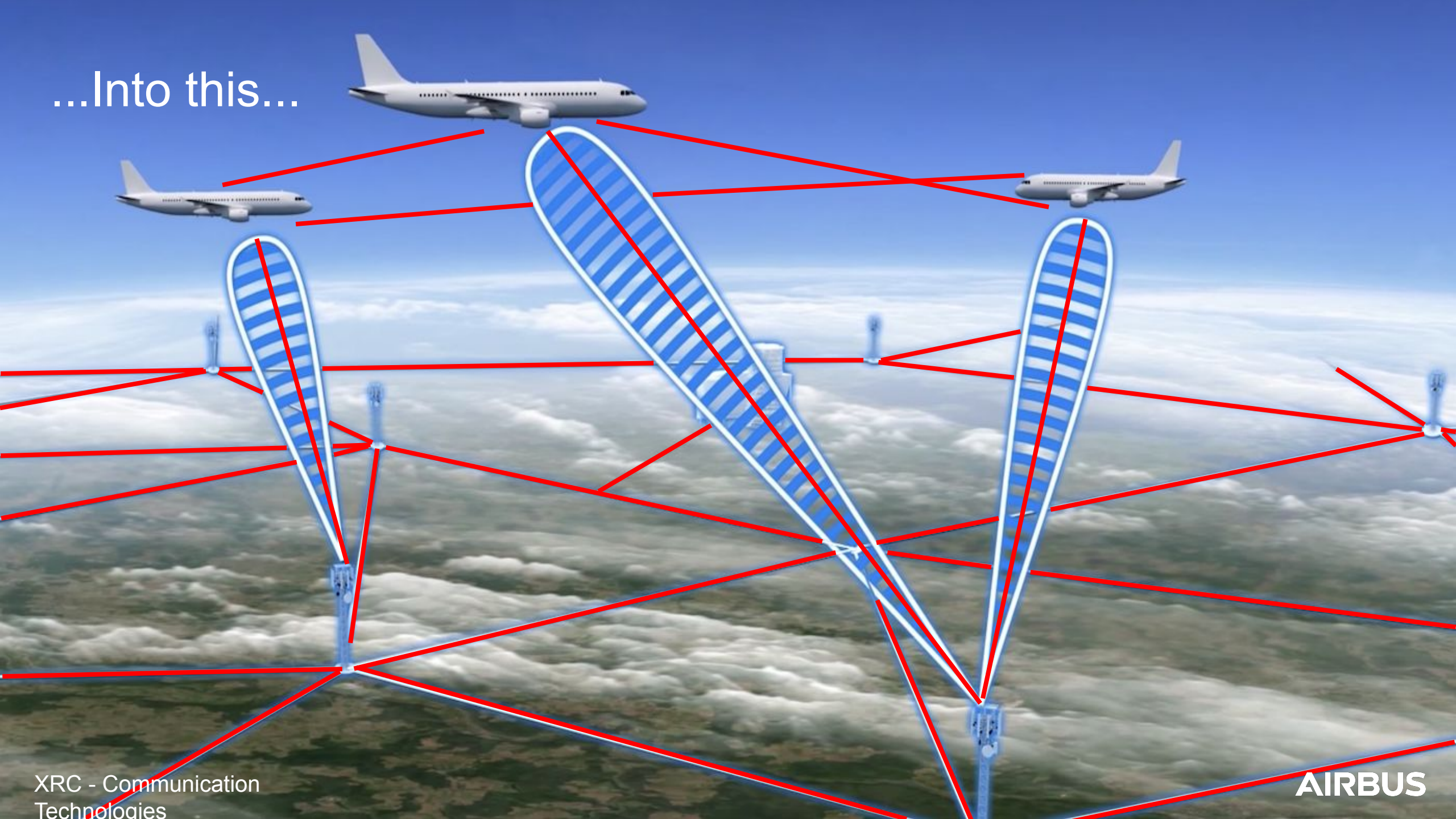

Turning this…
AIRBUS


...Into this...

State-of-the-Art – Global Context

4 min

December 14, 2023

Amazon's Project Kuiper completes successful tests of optical mesh network in low Earth orbit

Written by Amazon Staff

After demonstrating 100 Gbps optical links between its prototype satellites, Project Kuiper will include laser links on every satellite in its constellation to form a mesh network in space.

Space startup Aalyria demonstrates satellite mesh network

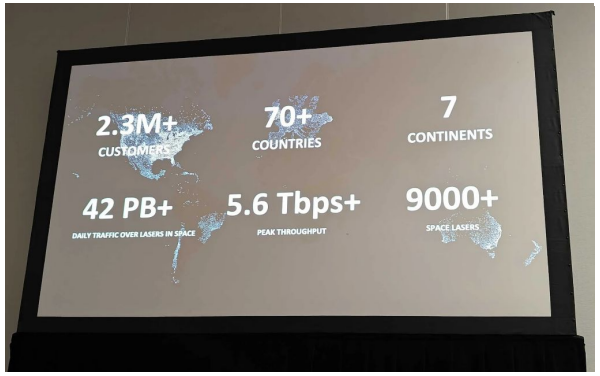
The company is working with the Defense Innovation Unit to create a "hybrid space architecture"

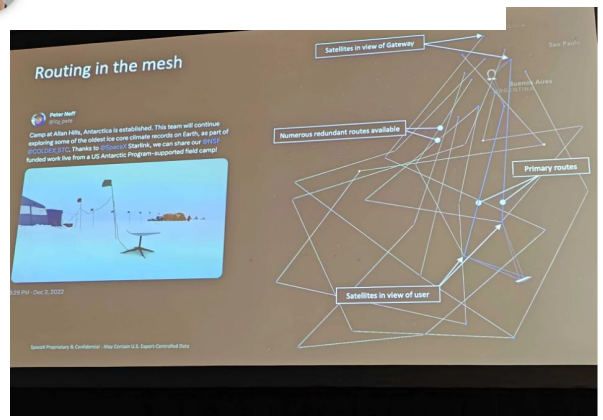
Sandra Erwin February 12, 2024

Starlink's Laser System Is Beaming 42 Million GB of Data Per Day

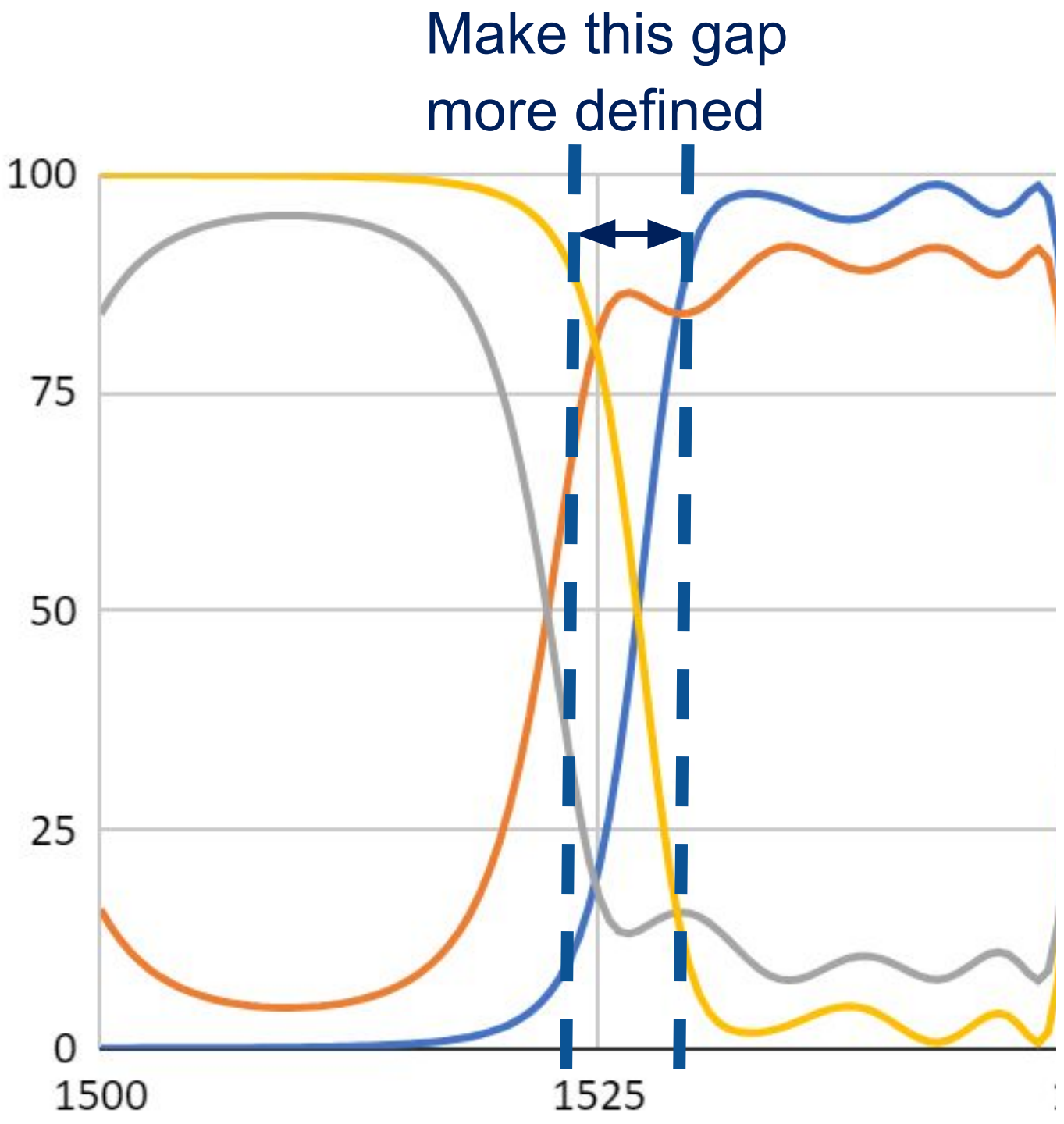
A SpaceX engineer details how the company is using a fleet of 9,000 lasers over the Starlink constellation to deliver high-speed internet across the globe.

by Michael Kan Jan 30, 2024





Need #1



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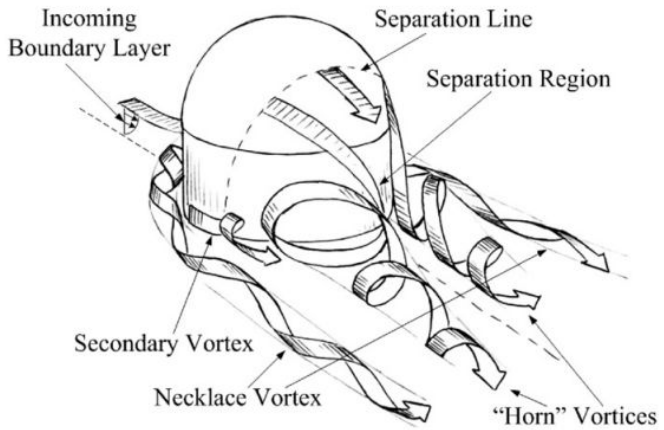
Need #2

- Optical technologies are a key enabler for high-data-rate communications between ground, air and space vehicles
- Traditional optical communication systems direct a laser using a pointing turret
- Turrets have a negative impact on:
  - Aerodynamics (drag = CO_2 emissions)
  - Optical link performance (aero-optical effects)



Use photonic solutions to eliminate turret!

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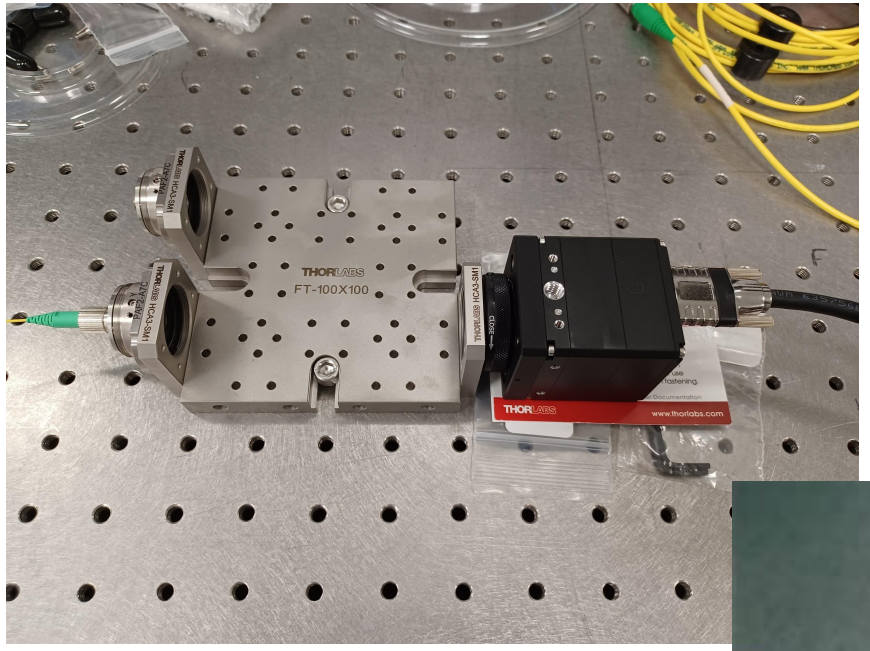
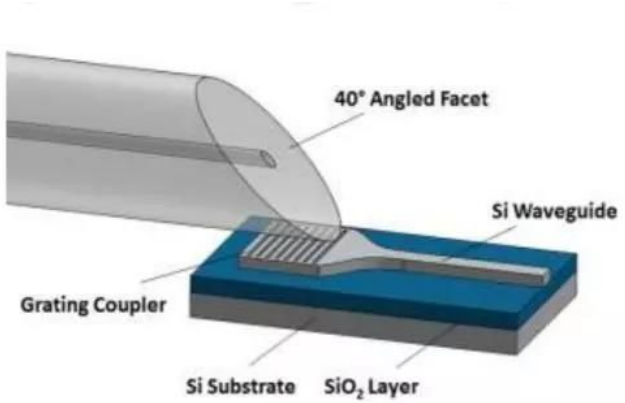
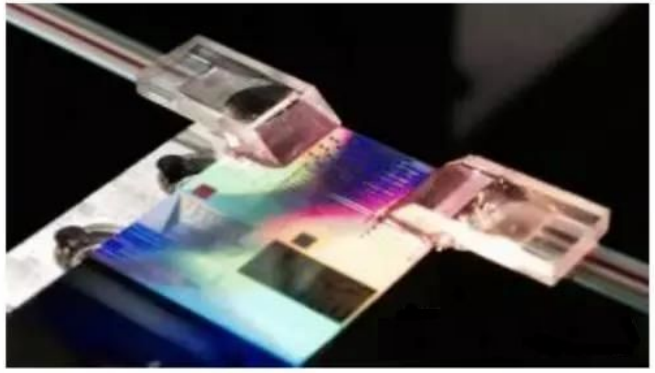
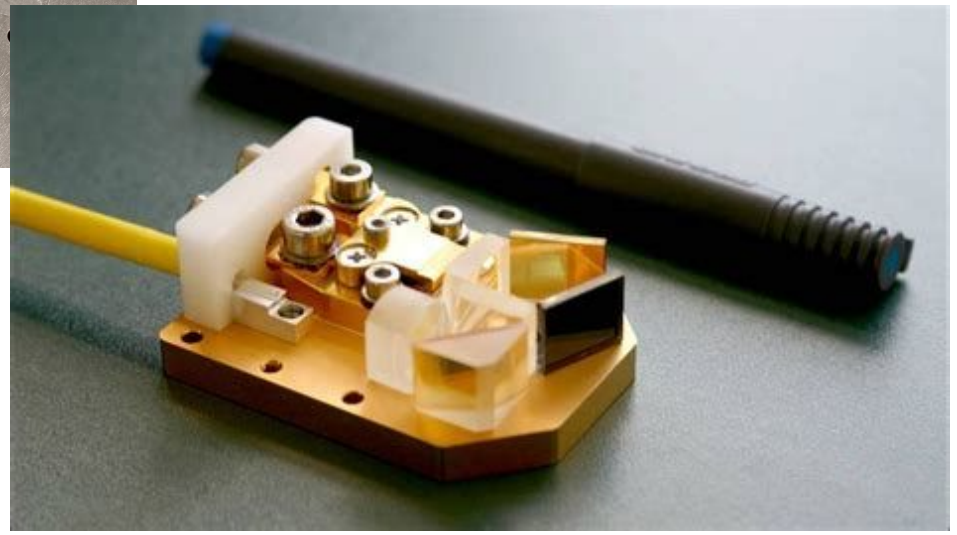
Need #3

- Photonic concepts for coupling light from free-space into fiber









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Need #4

- Better sources for increased key rates, e.g. high generation rate of entangled photons

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… and we're looking for future risk takers!

Thank you !

AIRBUS

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Optical Communications and Networks
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