STRATOSYST

HAPS SERVICES FROM STRATOSPHERE
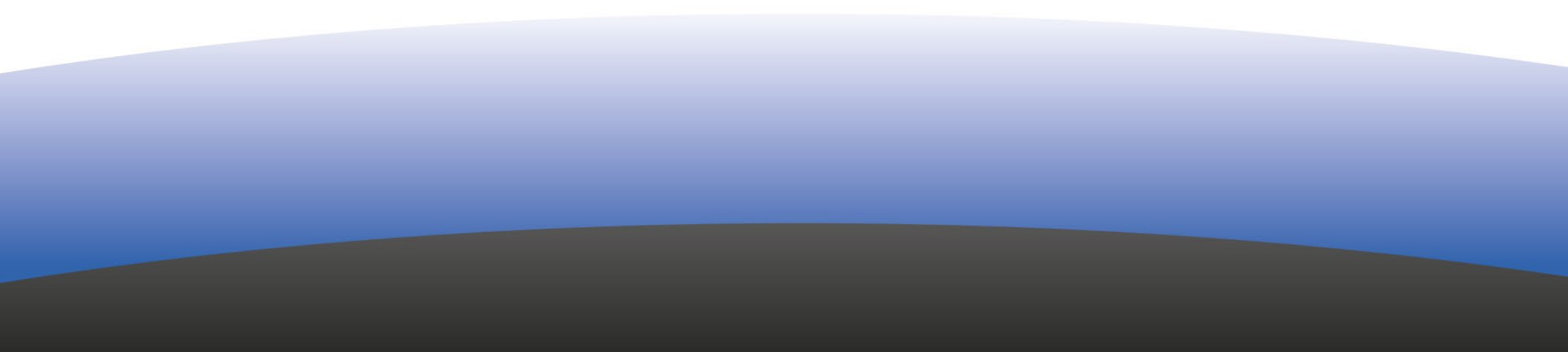
„SKYRIDER MISSION IS TO CREATE ADDITIONAL DATA SETS FROM STRATOSPHERE FOR EARTH OBSERVATION APPLICATIONS"

Utilizing payload development for Cubesats:

- Optical imagers
- Infrared imagers
- Radars
- Lidars
- Other instruments for remotely Earth sensing

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ESA SUPPORTED DEVELOPMENT

- ➤ **2018 Galileo Masters** - CZECH REPUBLIC REGIONAL WINNER

- ➤ **2019 ESA BIC Prague** - ESA BUSINESS INCUBATION CENTRE PRAGUE ALUMINI

- ➤ **2022 ITT1** - PROJECT ARRANGEMENT FOR A FRAMEWORK PROJECT IMPLEMENTING

  ESAS SUPPORT OF SPACE-RELATED ACTIVITIES IN THE CZECH REPUBLIC

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SkyRider HAPS for Earth Observation applications from Stratosphere

Lighter Than Air HAPS (High Altitude Pseudo-satellite)
operation altitude approximately **20 km**
mission duration **6 months**
payloads **12 kg** with power consumption **5 kW**
station keeping capability in winds up to **15 m/s**

SkyRider

Main HAPS Advantages:

- complementary to satellites
- altitudes above air traffic
- operation above weather
- high level of autonomy
- fast payload accommodation
- zero CO_2 Emission operation
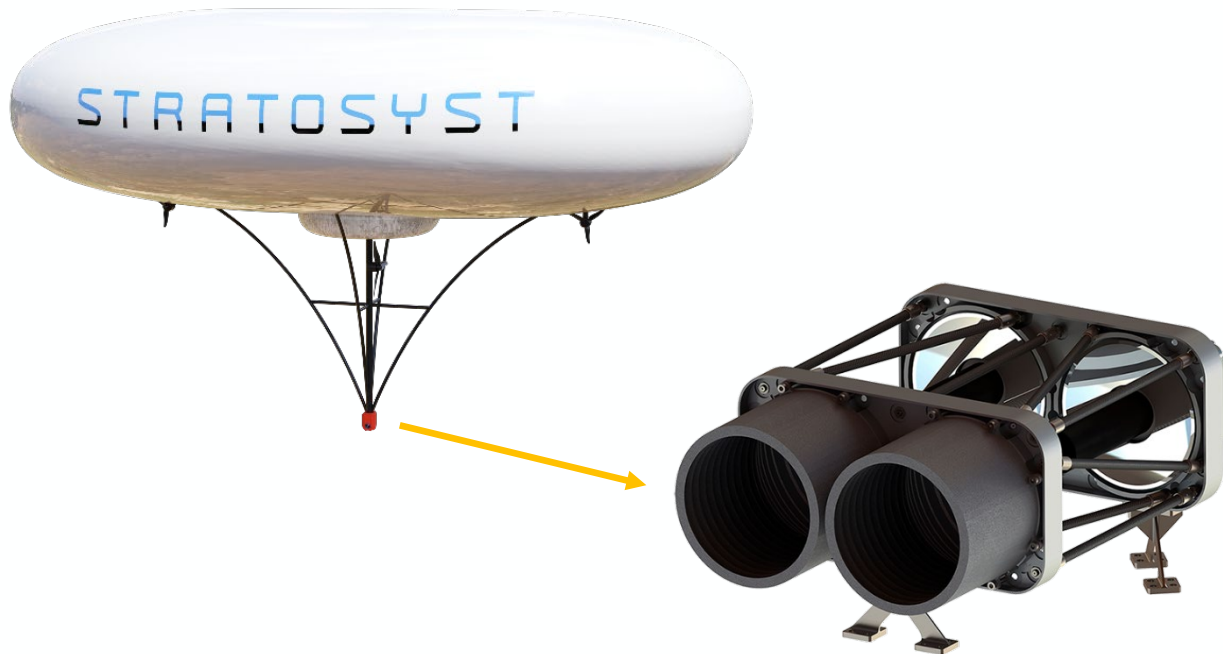- reusable

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SkyRider HAPS for Earth Observation applications from Stratosphere

SKYRIDER services can be divided into 4 major categories, ranging from Communication to Infrared Astronomy.

MARKET BREAKDOWN
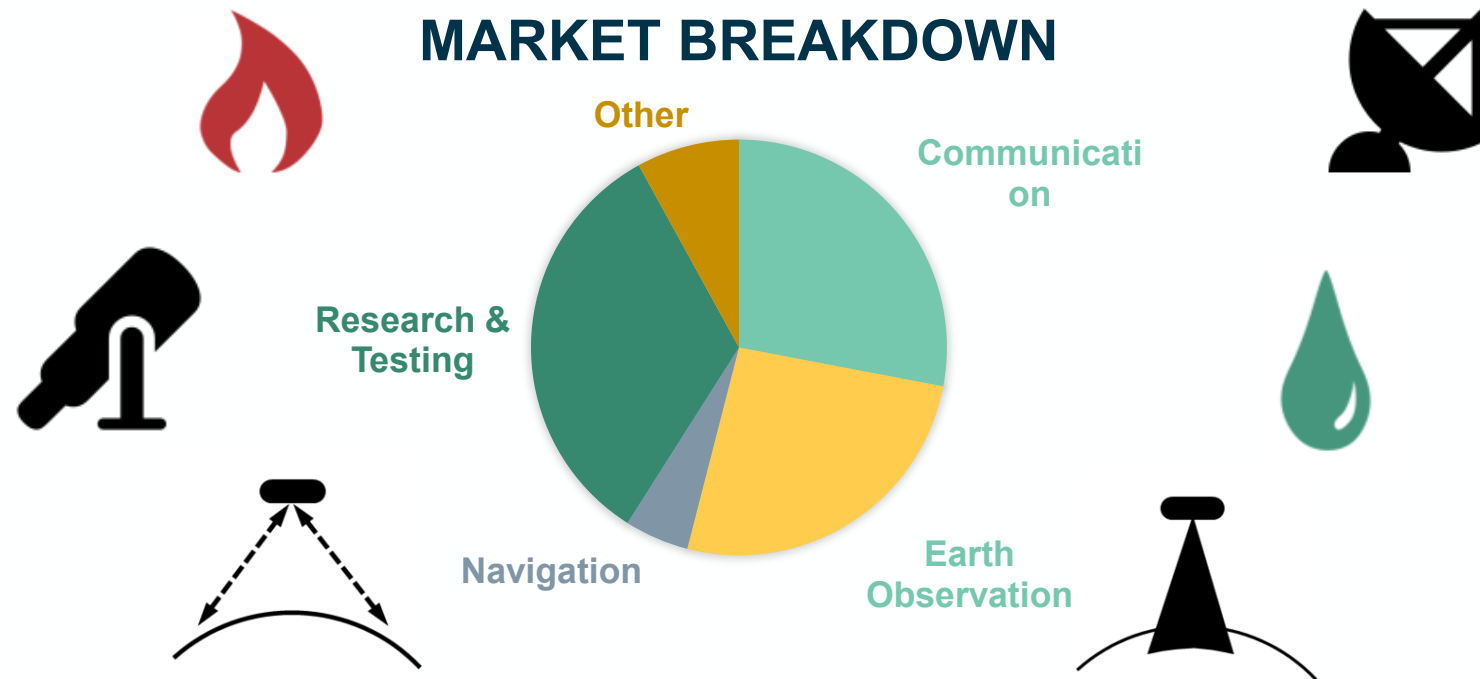
EARTH OBSERVATION

In 2017, the global EO economy was estimated to be between EUR 9.6 and 9.8 billion.

Use cases

Natural disasters

Agriculture

Freshwater

De-forestation

Oil & Gas leakage

Animal migration

Polar caps monitoring

Marine traffic

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Natural disasters prevention

Prevention of losses to environment, property, infrastructure and human lives
Fire detection
Meteorology

Duration: long-term operations (months)
Station-keeping: not required
Platform movement: circling above desired location(s)
Swarm operations: possible
Data transmission: live

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Monitoring of natural disasters

Fires, floods, hurricanes, tornados, …
Prediction of disaster evolution
Situational awareness and monitoring

Duration: short-term operations (days)
Station-keeping: required
Platform movement: limited
Swarm operations: possible
Data transmission: live

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Earth Observation on climate change

Climate change:
Polar caps
De-forestration
Animal migration
Water

Remote sensing:
Air pollution
Atmospheric measurements

Duration: long-term operations (months)
Station-keeping: not required
Platform movement: circling above desired location
Swarm operations: not required
Data transmission: daily

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Earth Observation over urban areas

Traffic management
Parking
Situational awareness
Heat monitoring
CO_2 measurements
Security

Duration: short or long-term operations
Station-keeping: required
Platform movement: limited
Swarm operations: possible
Data transmission: live

Telecommunication, IoT and 5G are among the biggest global markets. Expected revenue only for 5G will touch $4.2B in 2020.
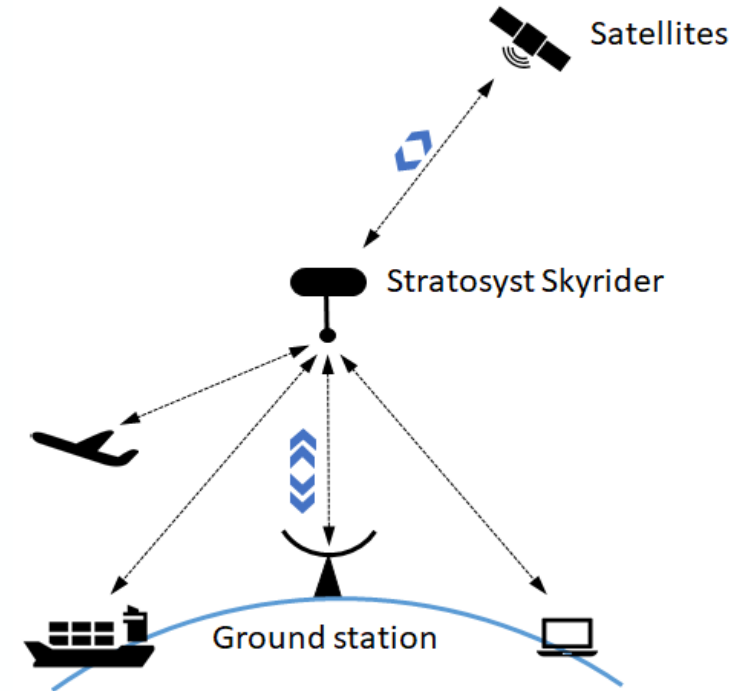
Use cases

3.8B people without internet connection

5G network (2G, 3G, 4G, 4G LTE)

IoT

Telemedicine

High-speed trading

Satellites

Stratosyst Skyrider

Ground station

https://www2.deloitte.com/us/en/pages/technology-media-and-telecommunications/articles/telecommunications-industry-outlook.html
https://www.gartner.com/en/newsroom/press-releases/2019-08-22-gartner-forecasts-worldwide-5g-network-infrastructure

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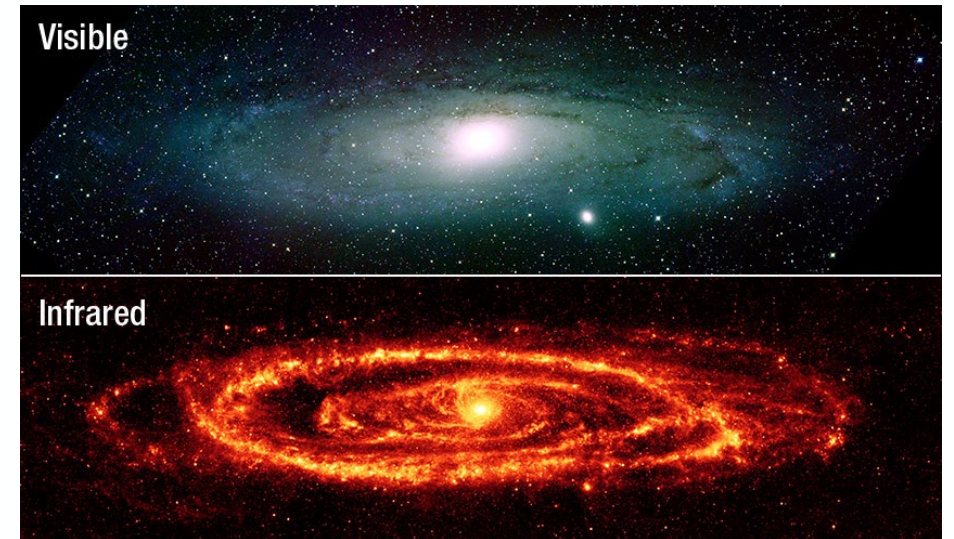Stratosphere is perfect for observing sky in various spectra.

Use cases

Infrared and Visible astronomy

Material testing

Space electronics qualification

Climate change

*"By observing in the infrared we can study how things get formed, the very early steps, because formation processes very often happen in cool and dusty places," explains **Göran Pilbratt**, ESA's Herschel Project Scientist*

Ultimate future: MARS Atmosphere exploration