STRATOSYST

HAPS SERVICES FROM STRATOSPHERE

PUBLIC PRESENTATION

Satellite market

Revenue of **$ 264 000 000 000** in satellite services, manufacturing and ground applications in **2018**
(source: www.sia.org)

Satellite market obstacles

Launch of 1 kg to orbit = 1 kg of gold + large development costs + long lead times

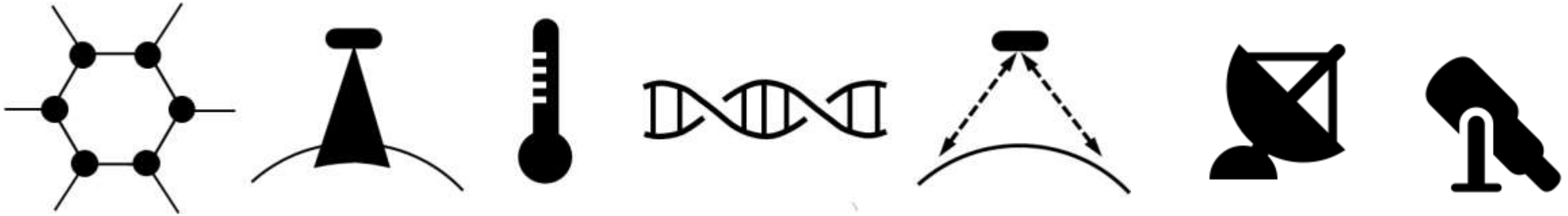
Obstacle for growth of the satellite service utilization

High Altitude Pseudo Satellites (HAPS)

High Altitude Pseudo Satellites (HAPS)

- Altitudes above air traffic
- Certain level of autonomy
- Airships vs. airplanes
- Affordable
- Complementary to satellites

What can HAPS do?



Experiments of Materials and Electronics

Earth Observation

Meteo

Biological Experiments

Telecommunication

Navigation

Space Observation

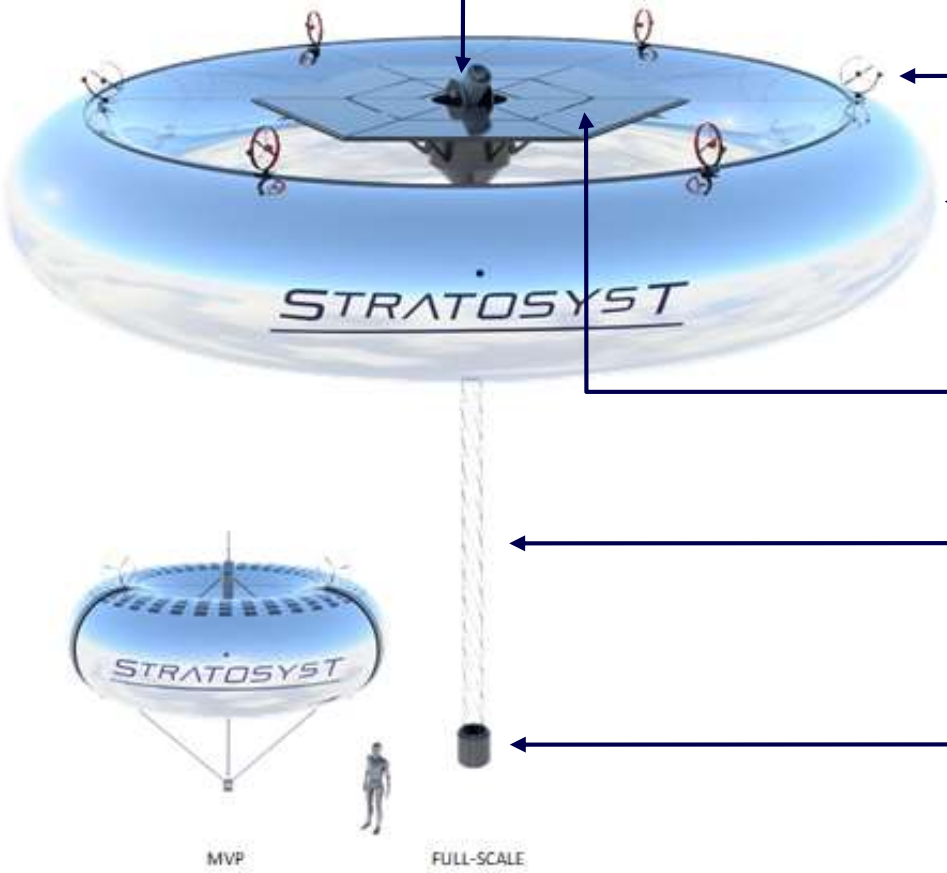
Stratosyst technology

Stratosyst fullscale

75 kg *MASS*	10 kg *PAYLOAD*
20 km *ALTITUDE*	months *OF FLIGHT*

Mimimum Viable Product

18 kg *MASS*	1kg *PAYLOAD*
3 km *ALTITUDE*	days *OF FLIGHT*



Payload

Maneuvering system

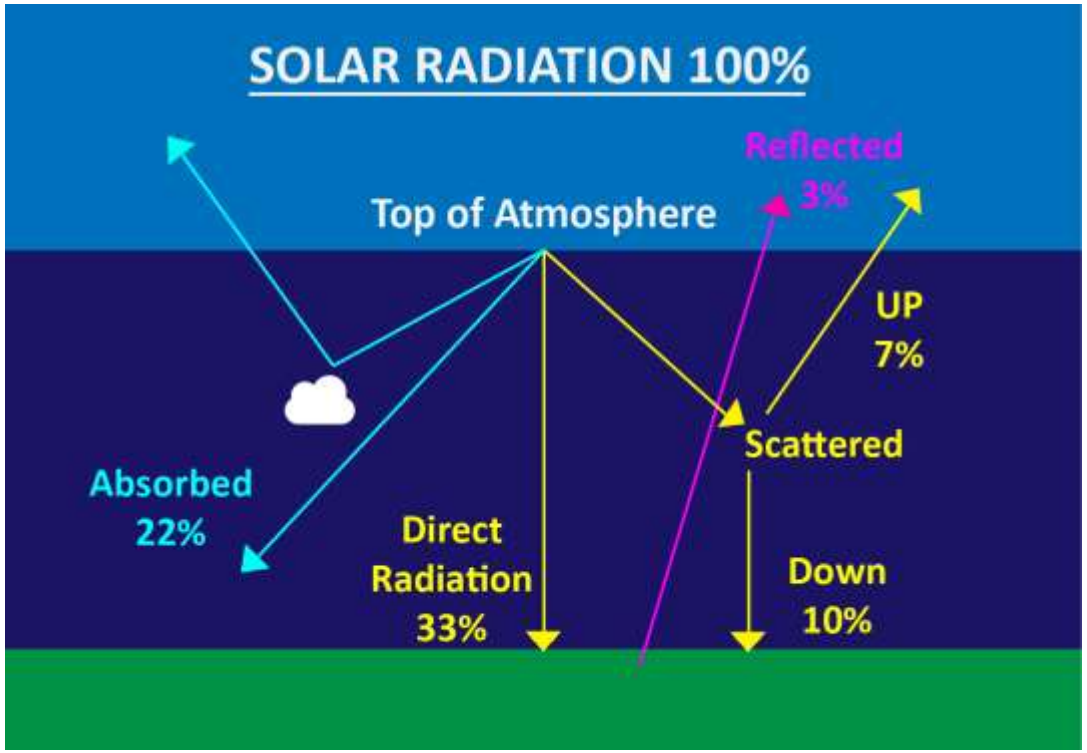
Pressure Difference Lift system

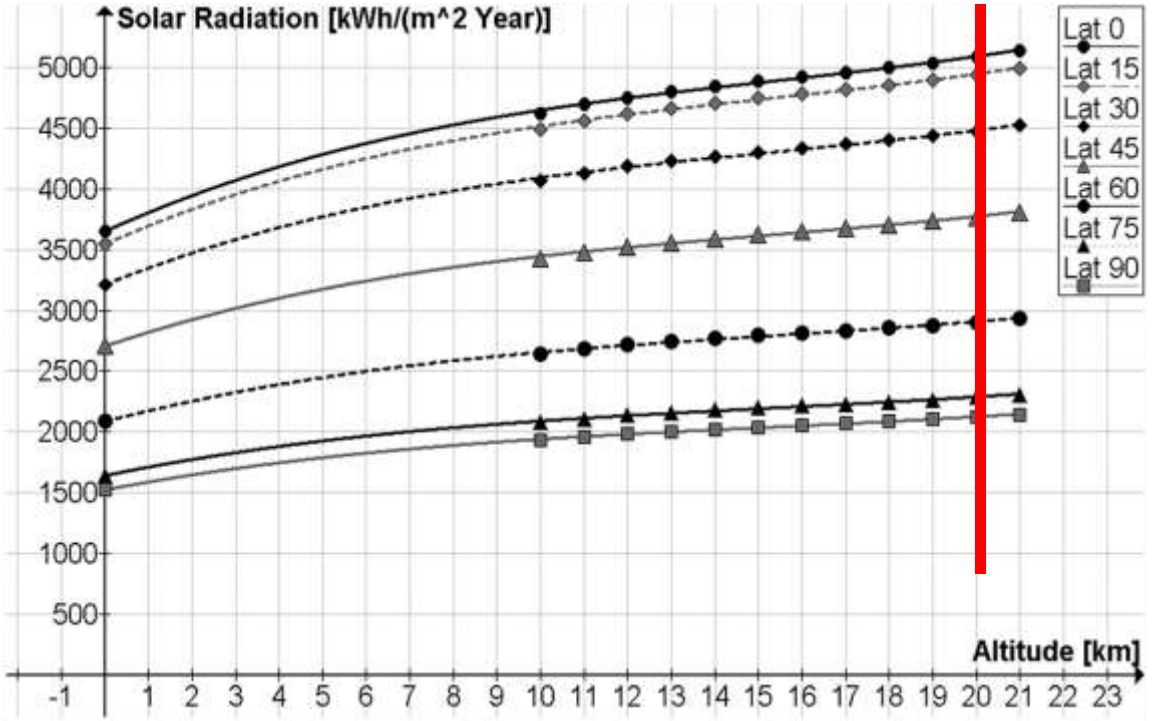
Solar cells

Vertical self stabilization

Energy storage

Solar radiation



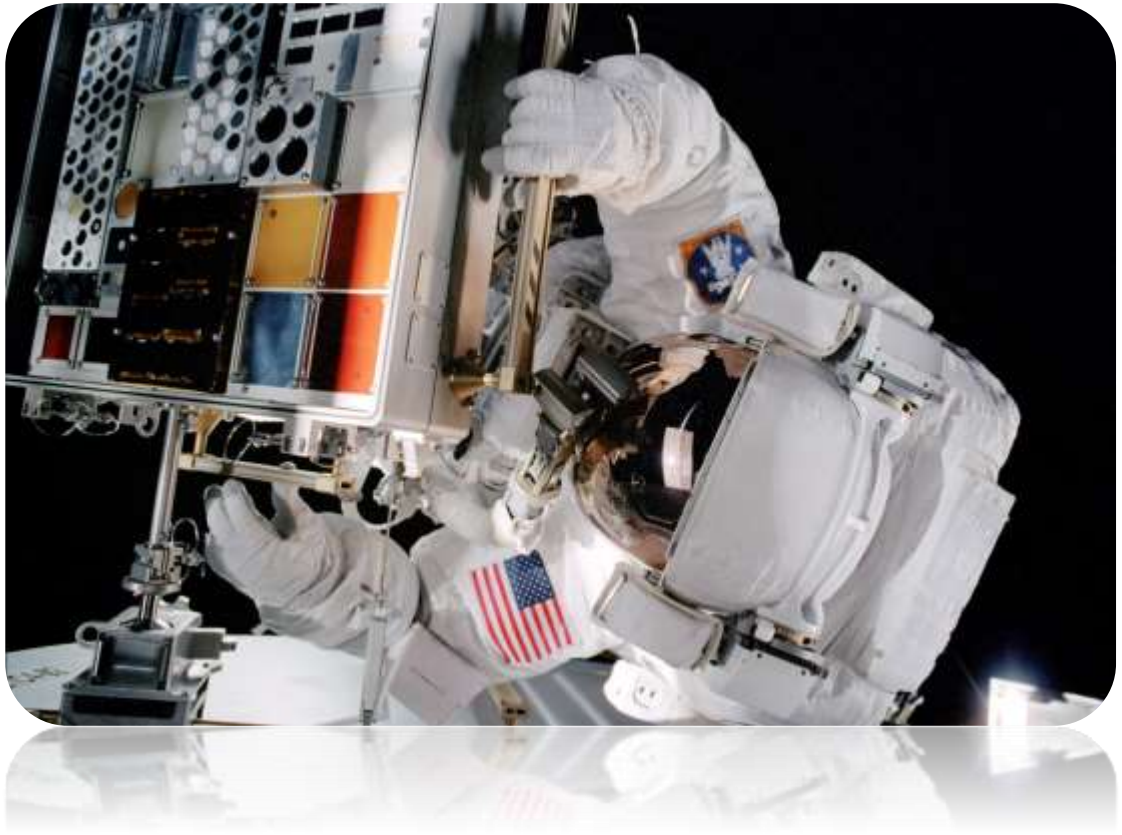


Solar radiation is risen by 40% at the equatorial stratosphere.
Efficiency of commercial lightweight solar cells is 22.7% SunPower Maxeon (Solar Impulse)

(source: ASME)

Strong space connection

- Use of global navigation satellite system
- Detailed Earth observation
- Use of satellite communication
- Use and refinement of satellite weather data
- Use of materials developed for space
- Applications and experiments



Meet the team

Jiří Pavlík

Team leader Power System Engineer

Skilled in design of solar powered systems

Richard Hynek

PDL and Structural Engineer

Skilled in spacecraft design from European Space Agency

Martin Farkač

Legal and Procurement specialist

Skilled in procurement in an international company

Jan Snížek

Propulsion Engineer

Skilled in 3D modeling and technology of manufacturing

Marek Novák

Electrical Engineer

Skilled in design of reliable electronics and medical technology

Václav Beránek

Software Engineer

Skilled in design of softwares for autonomous drones

2019-2023

Roadmap to stratospheric platform

2019-2020
Technology development

- Pressure Difference Lift
- Propellers
- Power generation
- Control algorithms

2019 - 2021
IPR, MVP production

- Patents
- Legislation
- B2B

2020-2021
Business plan for full scale STRATOSYST

2021
Minimal Viable Product

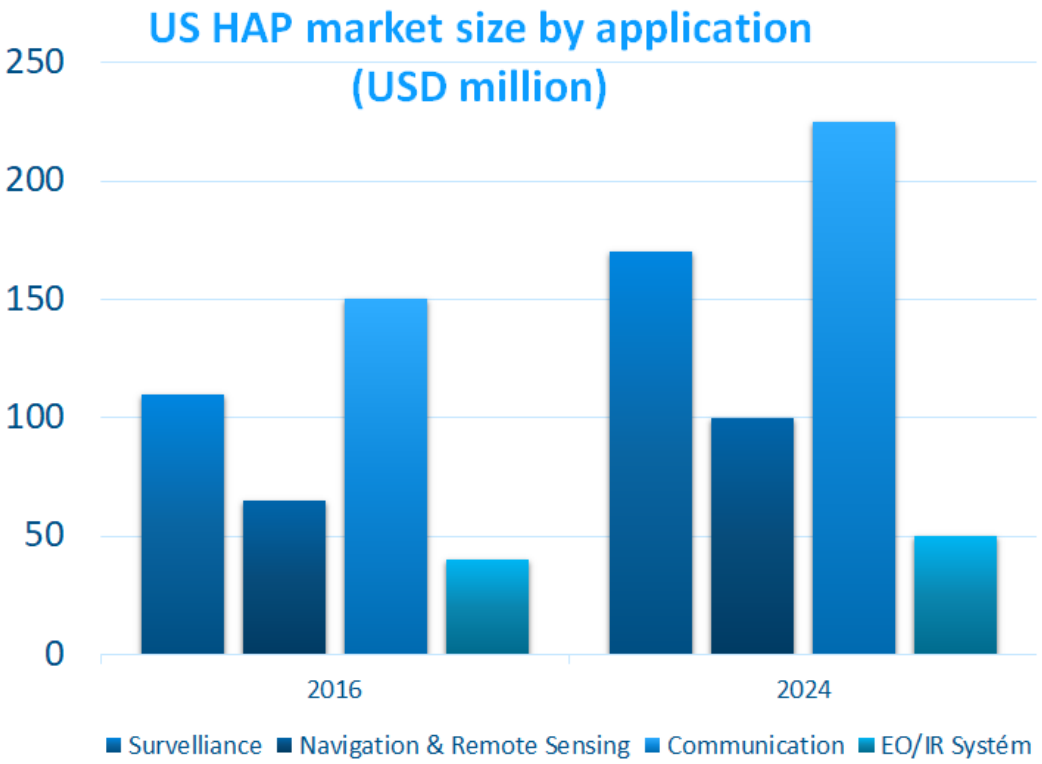
- 1 kg payload
- 3km altitude
- Days of flight
- Surveillance
- Comm relay

2021-2022
Technology development
Full scale STRATOSYST

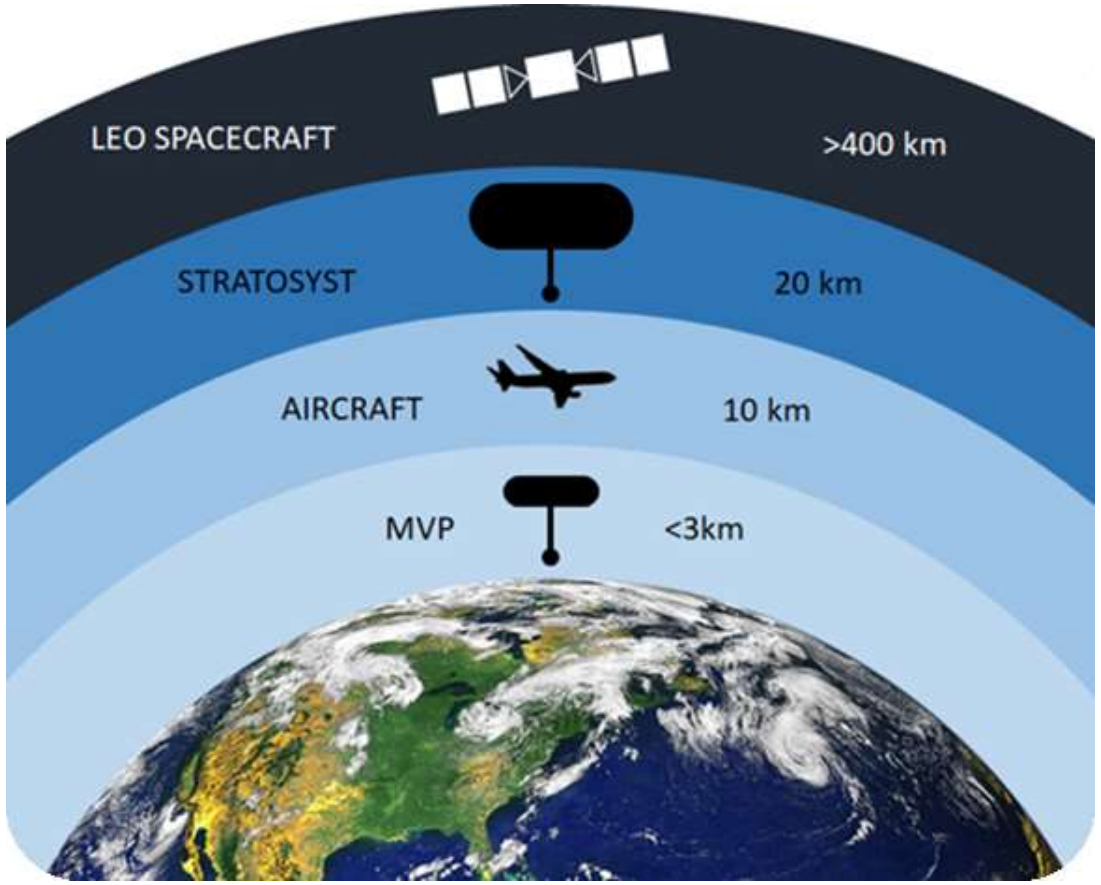
- Integration
- Operations
- Supplier chain

2023
STRATOSYST

Market



High Altitude Platform Market by 2024-HAP Technology Can Revolutionize The Aviation And Aerospace Industry
June 26, 2018



(source: HAPS4ESA 2019)

Competitors

Airbus Zephyr

- Must move to provide lift
- Unable of stationkeeping

Thales Alenia Space Stratobus

- Reliant of Helium
- Complex system

UAVOS Apus Duo

- Must move to provide lift
- Unable of stationkeeping
- Payload only 2kg

Alphabet Loon

- Reliant of Helium
- Unable of stationkeeping
- Limited control system

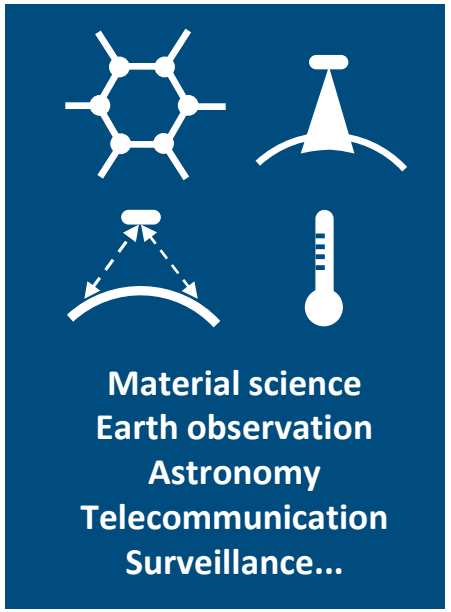
Open Stratosphere

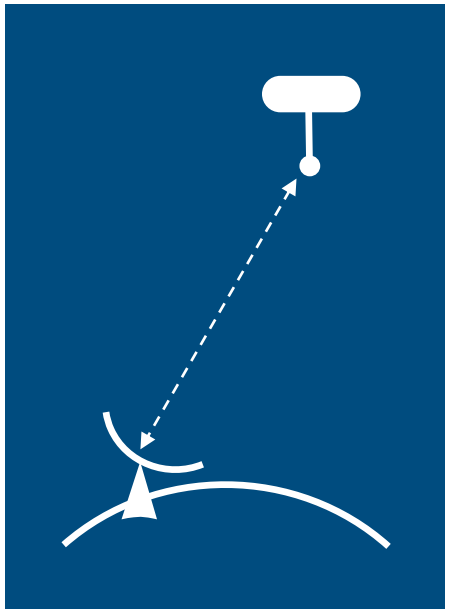
- Must move to provide lift
- Limited sky observing

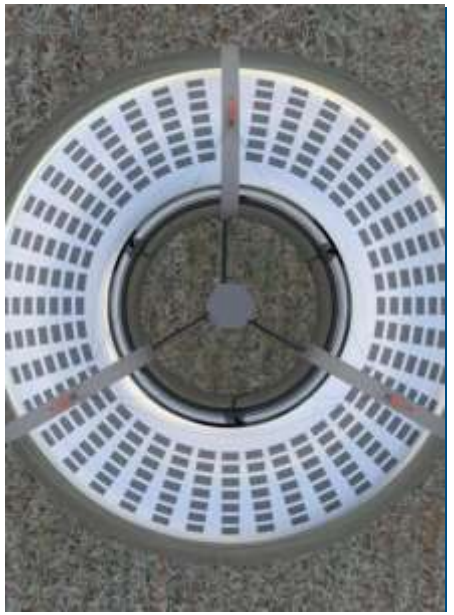
Avealto

- Reliant of Helium
- Difficult stabilization

Business model







Offer the platform and mission profile

Integrate the customer‘s payload

Launch the mission

Operate
Provide data

Land
Provide payload
Re-use

Financing

Expenses to develop MVP and full scale STRATOSYST

Concept

Stratosyst

2019

20 000 €

2022

500 000 €

2020

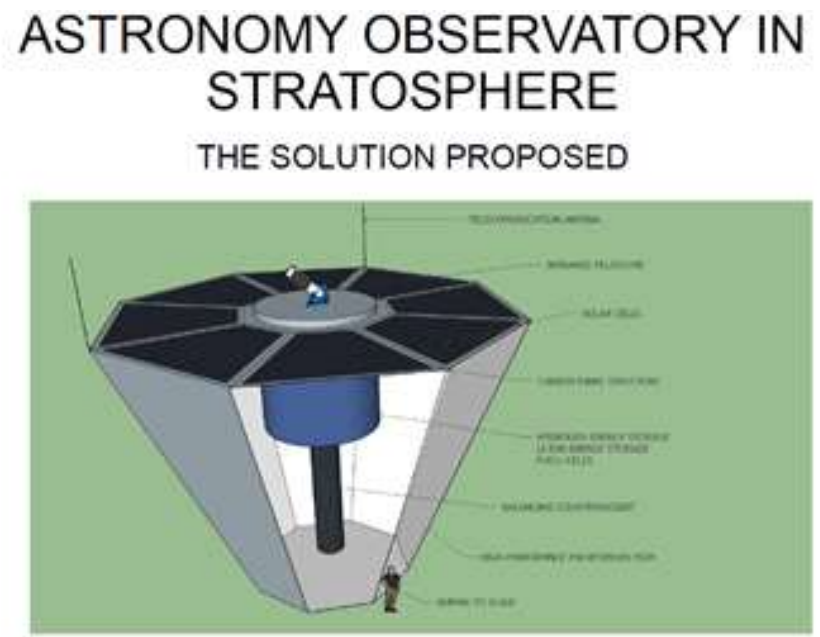
200 000 €

2021

300 000 €

MVP launch

We have already begun - 2017



We have already begun - 2018

ESA Business Incubation Centre - 2019

Partners

Astronomický ústav AV ČR

SSF

VZLÚ
... partner průmyslu

České vysoké učení technické v Praze
Fakulta strojní

elson
SPACE ENGINEERING

BigTerra

Technology Centre ASCR

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WWW.STRATOSYST.COM