

# BLUESPACE FUND

BLUESTAR  
Investment Managers

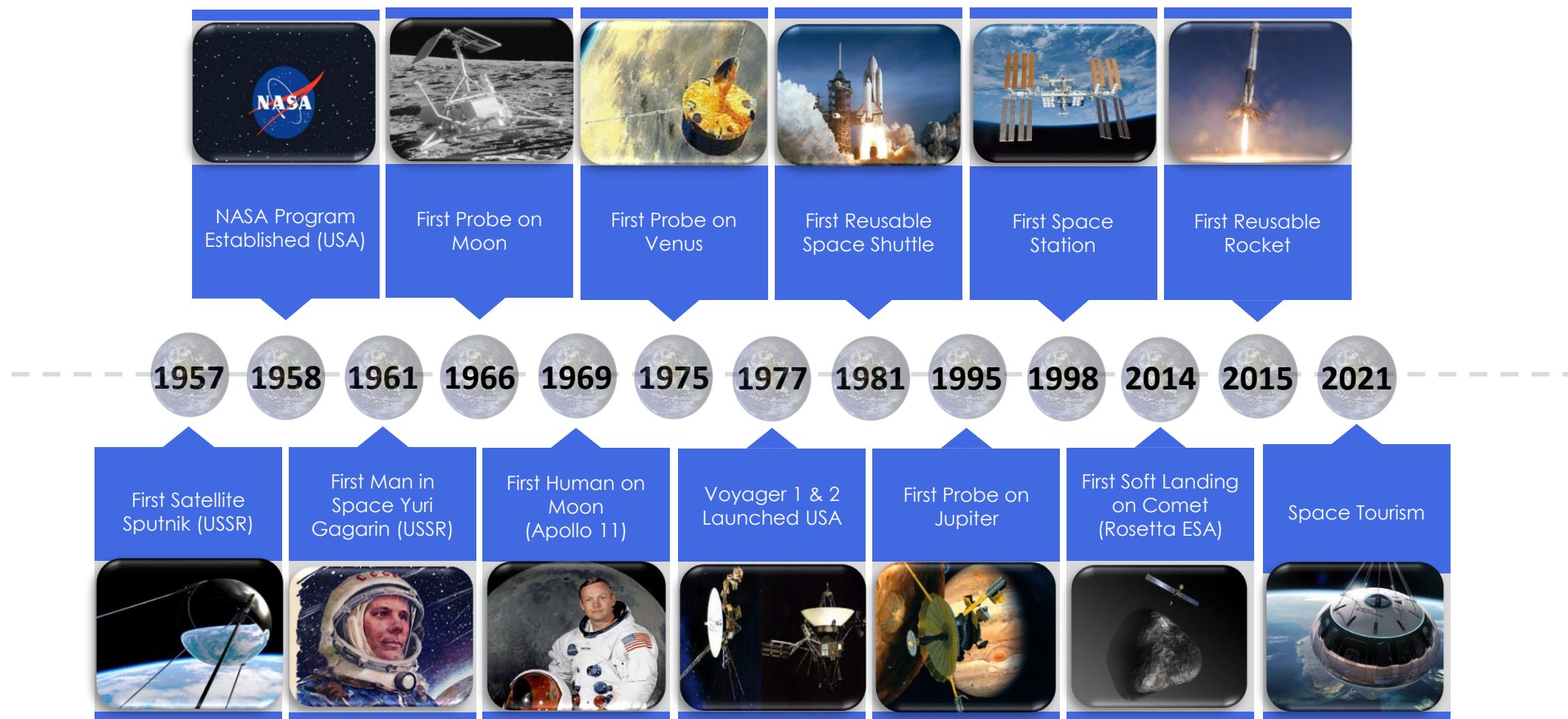


# SPACE ECONOMY

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The Space Economy is defined by OECD as the full range of activities and the use of resources that create value and benefits to human beings in the course of exploring, researching, understanding, managing, and utilising space.

# Space Exploration - Timeline





# Launch Industry

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*"If one can figure out how to effectively reuse rockets just like airplanes, the cost of access to space will be reduced by as much as a factor of hundred. A fully reusable vehicle has never been done before. That really is the fundamental breakthrough needed to revolutionize access to space."*  
Elon Musk

In December 2015, a Falcon 9 reusable rocket makes its first successful return landing at Vandenberg Air Force Base, California.

Reusable rockets can dramatically reduce the cost of launching payloads and humans, lowering the barrier of access to space.

Commercial launch cost per Kilogram to LEO (Low Earth Orbit), where the International Space Station is, has been reduced by a factor of 20, from \$54'500/kg cost of NASA Space shuttles to \$2'720/kg and \$1'410/kg for **SpaceX's** Falcon 9 and Falcon Heavy rockets respectively.

Other companies like **Blue Origin** and **Rocket Lab** are developing or already have reusable rockets, while **Virgin Orbit's** Launcherone rocket is carried to the upper atmosphere on a modified, reusable Boeing 747 jet.

## Small Satellites

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Today we are witnessing a change in the trend from launching satellites large as a truck and a weight of several tonnes to the far geosynchronous orbit, to the new trend of launching **constellations made of lightweight small satellites** to the nearer Low Earth Orbit.

Thanks to the falling costs and miniaturization of electronic parts, today satellites are less expensive and are much more efficient in terms of power/weight.

### Small Satellite Mass Categories:

Picosatellite: < 1 kilogram

Nanosatellite: 1- 10 kilograms

Microsatellite: 10 – 100 kilograms

Minisatellite: 100 – 180 kilograms

### What are **CubeSats**?

Cubesats are a class of nanosatellites that use a standard size and form factor. One unit or "1U" measures 10x10x10 cm and is extendable to larger sizes: 2U, 3U, 6U and even 12U.

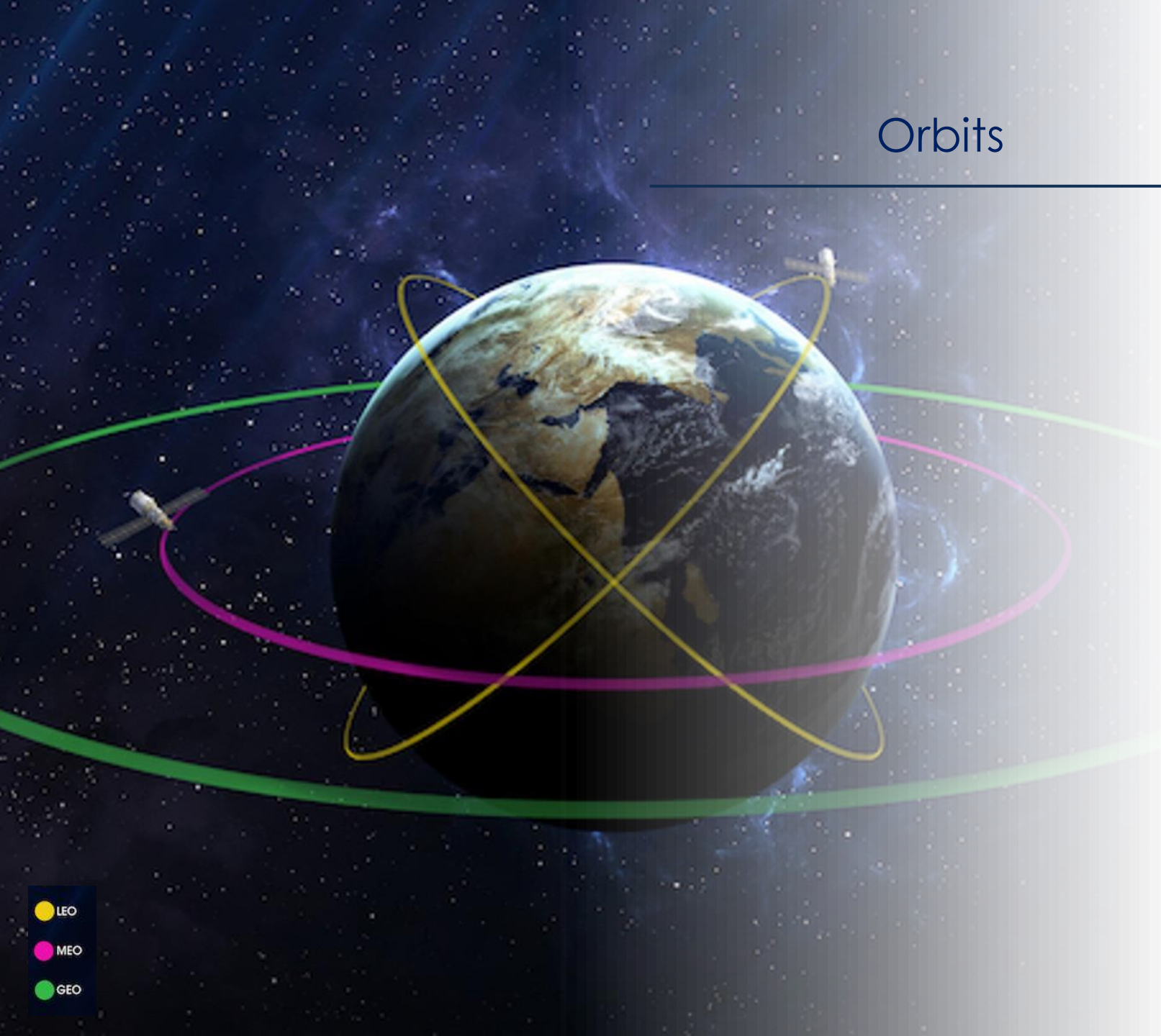
*"We started Planet Labs to make satellites ultra-compact, small and highly capable."*

*"This is our satellite, this is not a scale model, this is the real size. It's 10x10x30 centimeters, it weighs 4 kilograms, and we have stuffed the latest and greatest electronics and sensor systems in this little package."*

*Will Marshall*



# Orbits



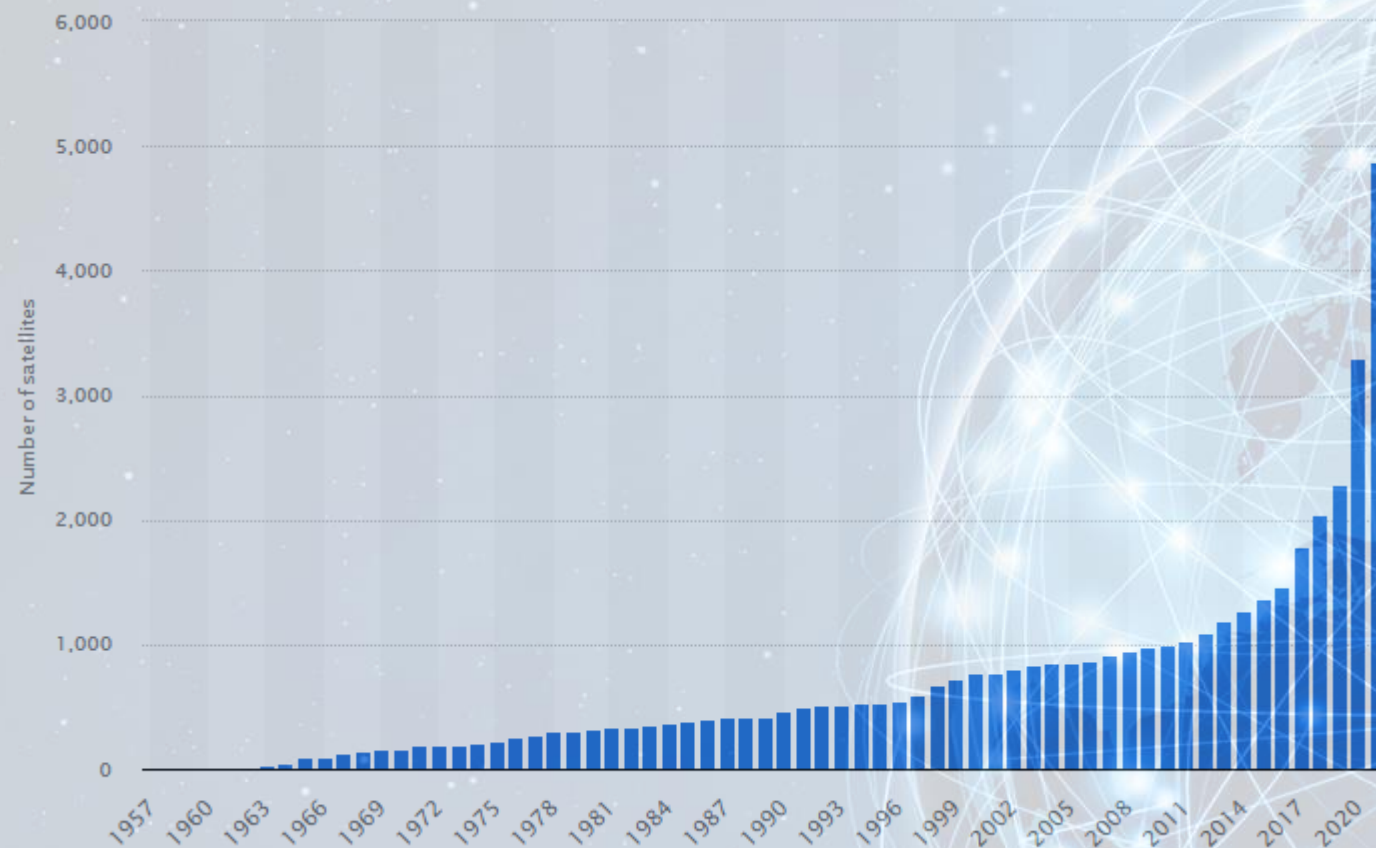
**Low Earth Orbit (LEO):** between 200 and 2'000 km above the Earth's surface. Spacecraft in LEO make one complete revolution of our planet in about 90 minutes.

**Medium Earth Orbit (MEO):** is the region of space above LEO and below the geosynchronous orbit. The orbital period of MEO satellites ranges from about 2 to 12 hours. The most common use for satellites in this region is for navigation.

**Geosynchronous Equatorial Orbit (GEO):** is a region in which a satellites orbits at approximately 36'000 km above the Earth's surface. At this altitude, the orbital period is equal to one rotation of the Earth. By orbiting at the same rate in the same direction as Earth, the satellite appears stationary relative to the surface of the Earth. This is effective for communication satellites.

**Polar Orbit** refers to spacecraft at near polar inclination at an altitude of 700 to 800 km. A special polar orbit is the **Sun-Synchronous Orbit (SSO)** in which a satellite passes each latitude on the Earth's surface at the same local time every day.

## Number of active satellites growing exponentially



**24'700 satellites** to be ordered and launched by 2030, according to Northern Sky Research

90% of them will be part of satellite constellations



**5X by 2030**

Source: Statista – Number of active satellites from 1957 to 2021



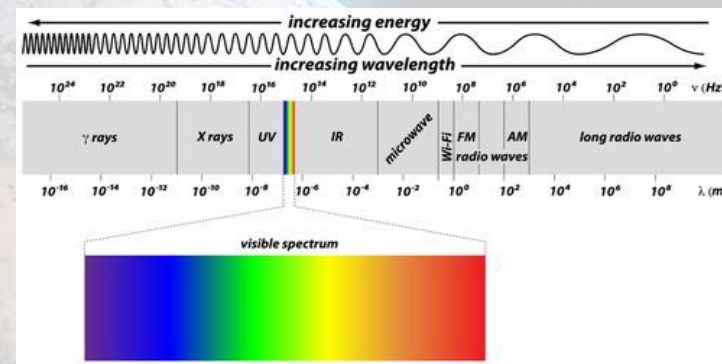


# Earth Observation

All electromagnetic radiation is light, or energy, but the human being can only see a small portion of this radiation. This is called «visible light».

Lower frequencies include radio waves, microwaves and infrared, while higher frequencies include UV light, X-rays and Gamma rays.

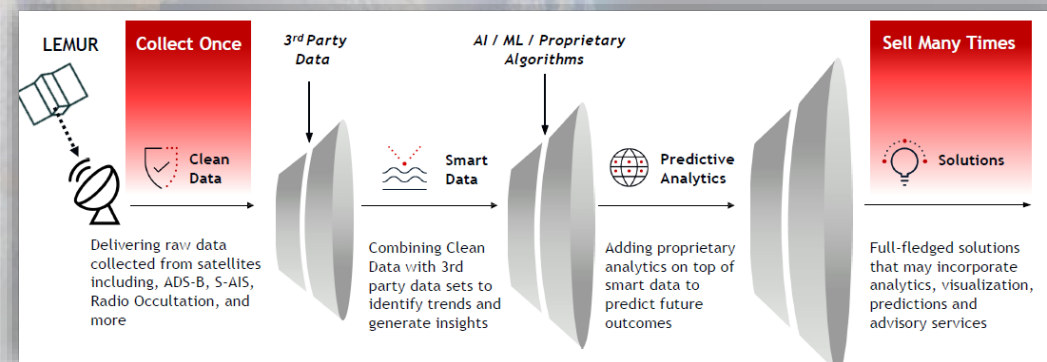
Fortunately, Earth's atmosphere blocks gamma rays, X-rays and most of UV light, while it allows for the observation of planet Earth in the visible spectrum, in part of the infrared spectrum and in the radio wave range.



New satellite constellations permit continuous monitoring of planetary conditions.

It's a lot more than taking pictures of our planet: advanced cameras placed in satellites orbiting in LEO collect information both from visible and invisible light, producing important data used for various purposes.

Collected data is very important, but it becomes even more useful when it is elaborated with powerful analytics technology and Artificial Intelligence.



Example:  
Spire Global  
business model



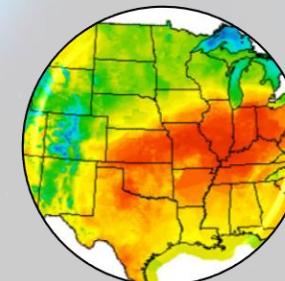
## CHANGE DETECTION

Climate Change  
Deforestation  
Wildfire detection  
Urban development



## MONITORING

Intelligence  
Infrastructure/Resource Utilization  
CO2 emissions  
Illegal fishing



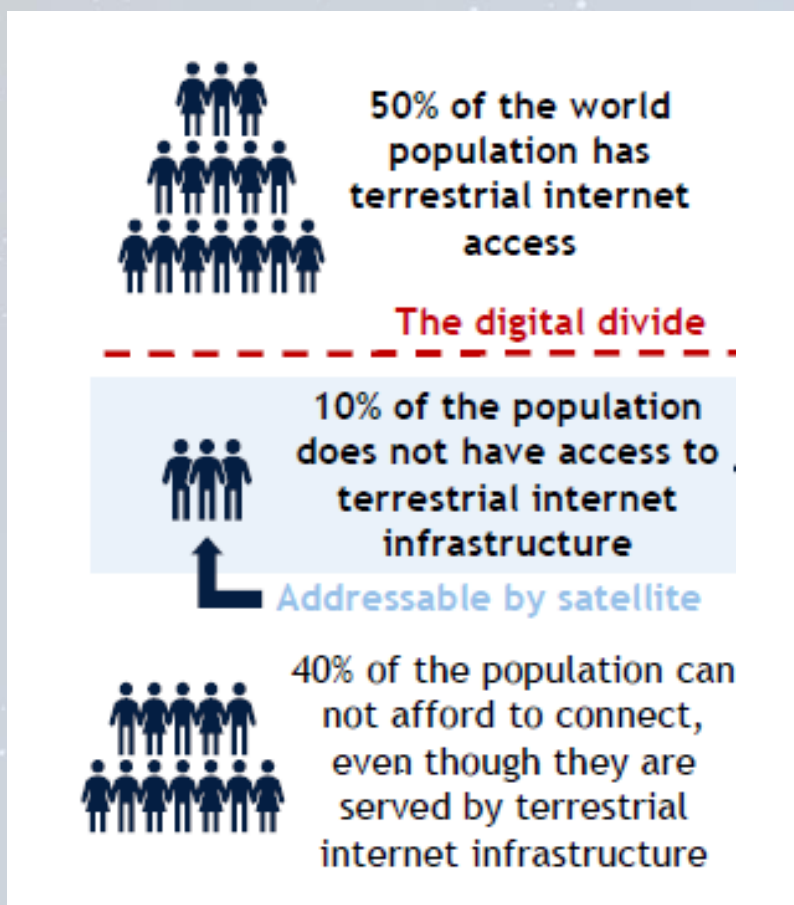
## PREDICTIVE ANALYTICS

Weather forecast  
Natural disasters  
Route optimisation  
Humanitarian response





## The satellite broadband opportunity



Source: Euroconsult

**700mln** people are addressable by satellite as they lack access to terrestrial infrastructure

Today, **43 mln** people are connected to satellite broadband services: only **6%** of the total addressable market

**80%** of users in emerging markets vs. **20%** in developed markets.



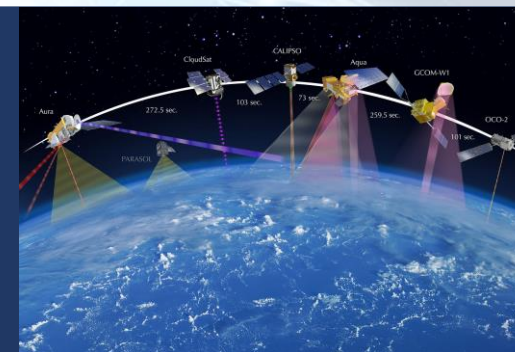
# Connectivity

TV Broadcasting services currently constitute the largest source of revenue, but they will be replaced in economic terms by **internet broadcasting** and by **IoT services**. Technically, this will mean a greater emphasis on LEO satellites and so-called constellations.



What will be connected from satellites:

Homes  
Enterprises  
Government  
Maritime (merchant, offshore energy, cruise, fishing)  
Aviation(in-flight connectivity)



The latest generation of satellite constellations permits the development of a fast telecommunications network with imperceptible **low latency** which potentially covers every corner of the planet.



Examples are:

Starlink (SpaceX)  
Oneweb (Eutelsat)  
Project Kuiper (Amazon)



This will enable the space sector to become a fundamental player for **5G connections** in all harder to reach areas, characterized by an exposure to the significant **growth in IoT** (Internet of Things) segment, M2M (Machine to Machine), and Artificial Intelligence.



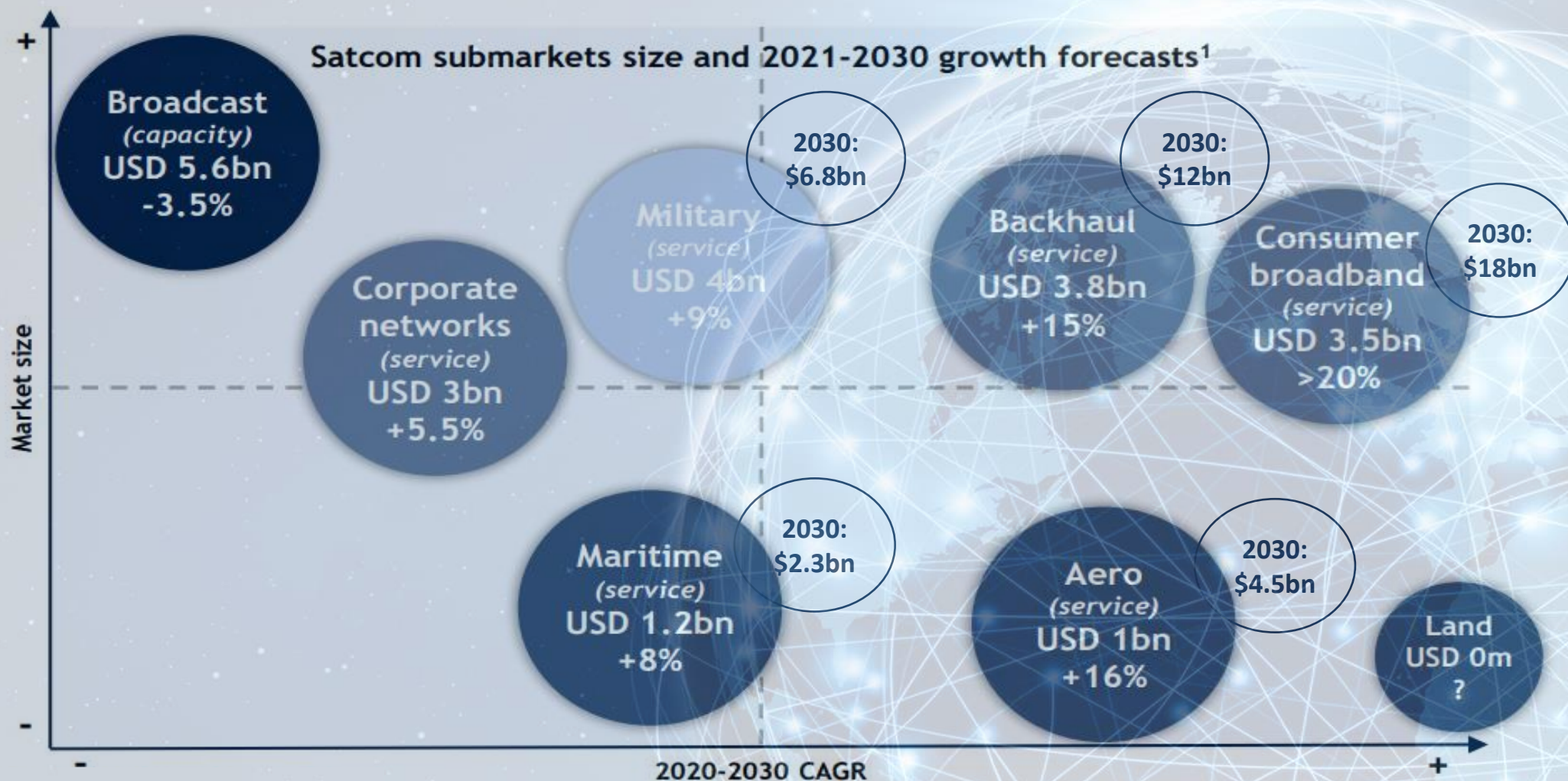
Some applications are:

Remote learning  
Telemedicine  
Videocall  
Streaming  
Online gaming  
Asset monitoring  
Natural disaster backup line





# Connectivity sub-segments growth estimates

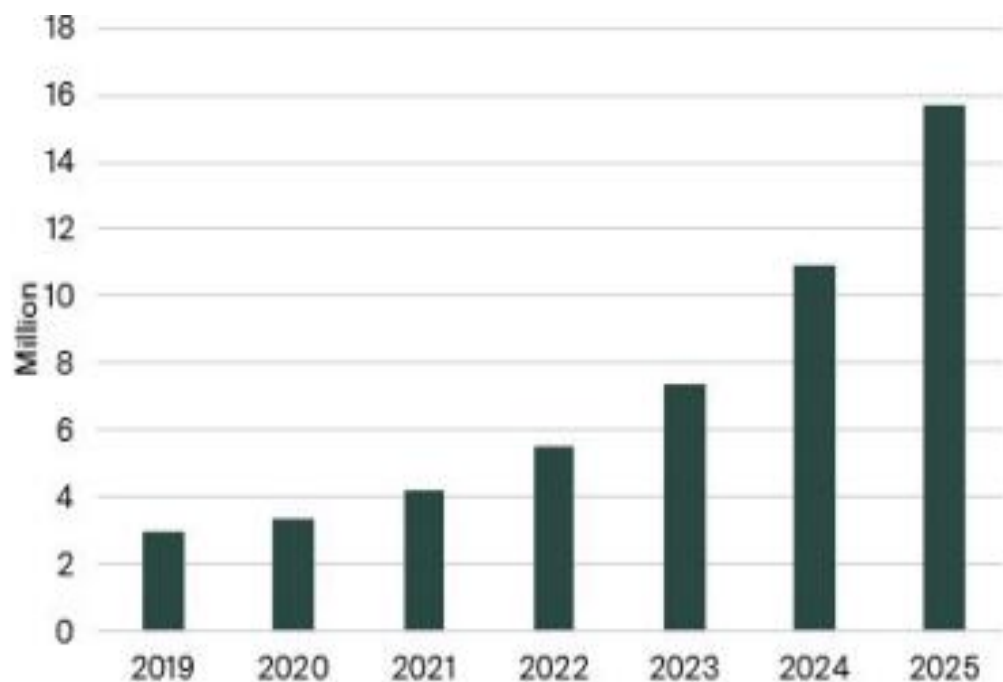


Source: Euroconsult



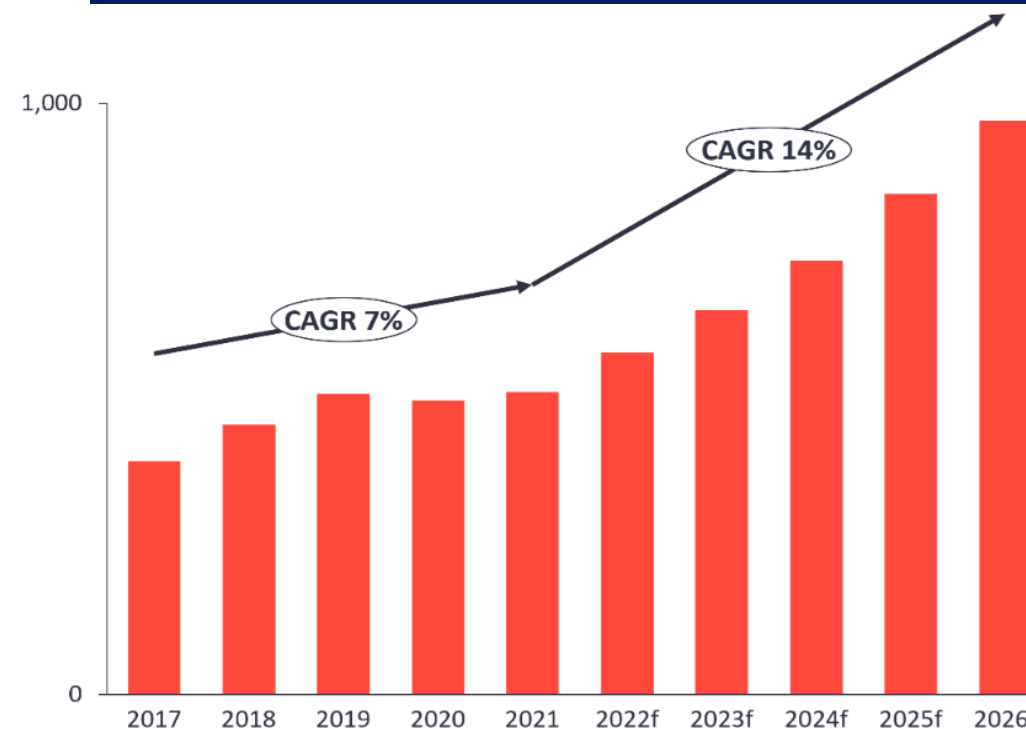
# Satellite IoT Market Growth Estimates

Satellite IoT subscribers ( World 2019-2025 )



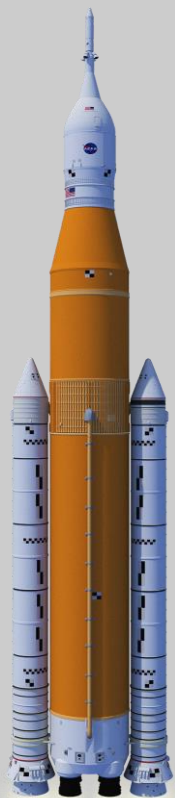
Source: Berg Insight – The Satellite IoT Communications Market

Market Size (in \$M)



Source: IoT Analytics Research 2022 – Satellite IoT Market Report





## Back to the Moon

With Artemis missions, NASA will land the first woman and first person of color on the Moon. The Space Launch System (SLS) is the world's most powerful rocket. It can send the Orion Spacecraft, astronauts and cargo to the Moon on a single mission.

The following companies are involved in the program:



The mission includes a space station in lunar orbit, called «Gateway».

It will be an outpost orbiting the Moon that provides vital support for long-term human return to the lunar surface, as well as a staging point for deep space exploration.

The first Gateway modules will be launched by SpaceX.



# Space Infrastructure

The International Space Station (ISS) has been the cornerstone of microgravity research over the past 20 years, but it is nearing the end of its life. The Biden administration extended the life of the ISS to 2030 (from 2024). Between government and private interests, there are currently 8 new space stations in development, including China's space station, Tiangong.

New space stations target essentially 3 expanding markets:

- ★ Research
- ★ Manufacturing
- ★ Tourism

The ISS is a modular space station in low Earth orbit, at an average altitude of 400 km. It circles the Earth in around 90 minutes at a speed of 7.66 km/second. Over the last two decades, the ISS has hosted more than 3'000 scientific research and technology development projects. The first module was launched in 1998 as a collaborative project involving five space agencies: NASA (United States), Roscosmos (Russia), JAXA (Japan), ESA (Europe) and CSA (Canada).

Recently NASA announced three awards for new space stations:



## Starlab

Partners: Nanoracks, Voyager Space, Lockheed Martin. Starlab will be continuously occupied by four astronauts focusing on scientific research. The station will have a volume of 340 m<sup>3</sup>, about a third the size of the ISS. TBL in 2027.



## Orbital Reef

Partners: Blue Origin, Sierra Space, Boeing, Redwire. Orbital will be the premier mixed-use space station in low Earth orbit for commerce, research, and tourism. TBL in 2025-2030.



## Unnamed

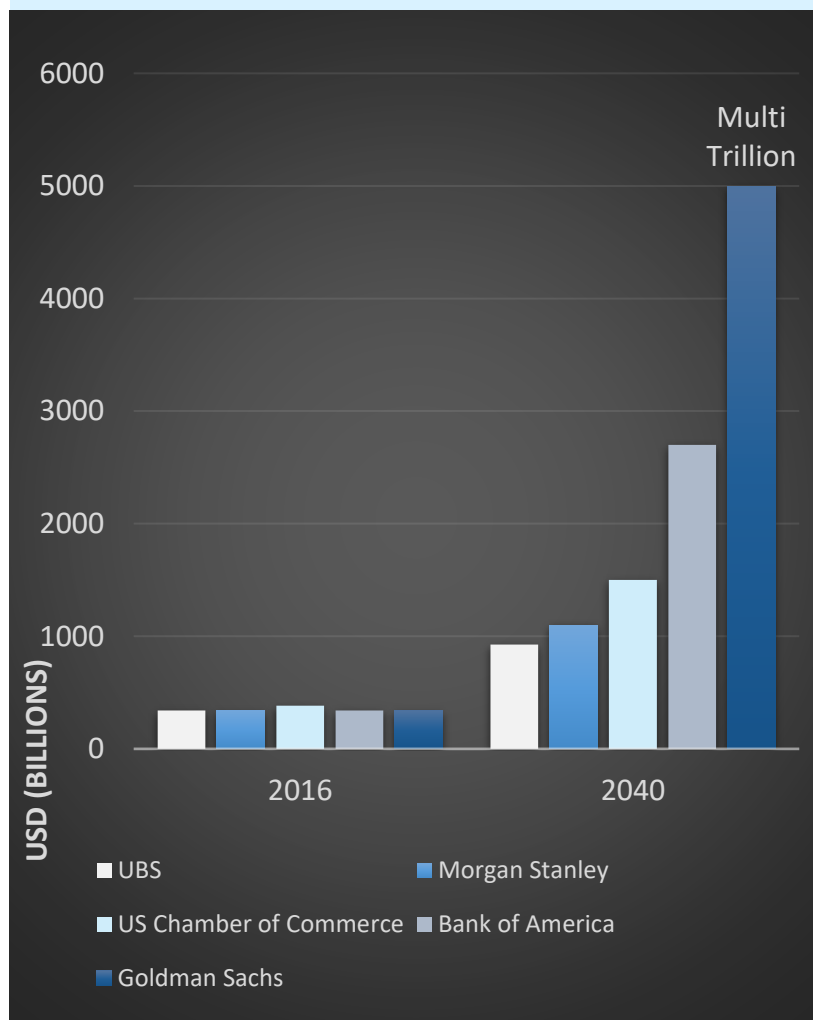
Partners: Northrop Grumman, Dynetics. Mission: to design a safe, reliable and cost-effective commercial space station in LEO. Rapid development with modular expansion will meet the growing need of the space economy TBL: not known.



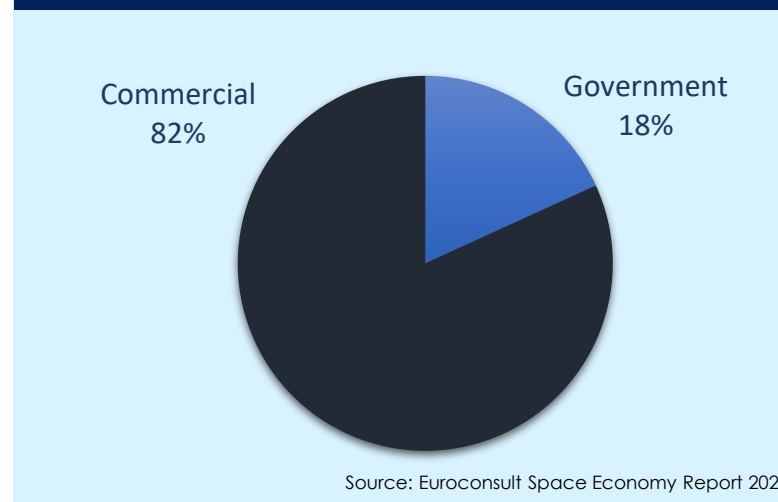


# How much is the Space Economy Worth

Growth projections



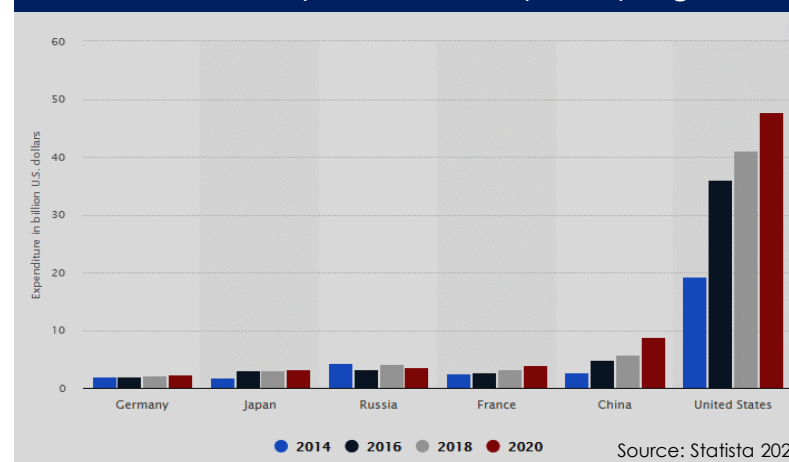
Space Economy contribution in 2020



Historically financed by the public sector, in recent years the private sector has represented a sector which is becoming more and more active in terms of investments, research, and technological innovation.

Technological advances permit the construction of lighter and more efficient satellites as well as a sharp reduction of the costs of orbital launches.

Government expenditure on space programs

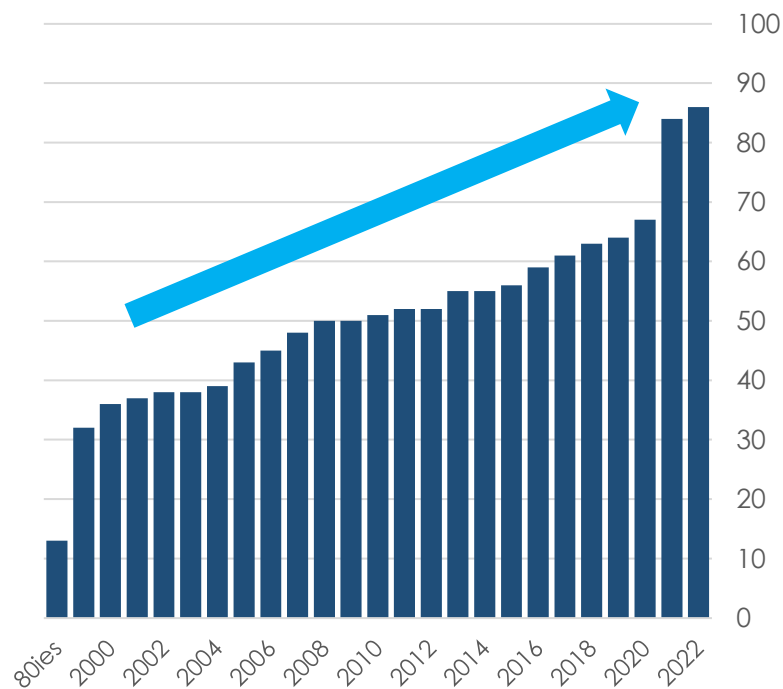


On the other hand, there is strong demand for new and innovative services particularly related to new forms of telecommunications and data transmission (such as 5G and Internet of Things), that will propel the growth of the SPACE ECONOMY in the coming decades, making it a high growth sector.



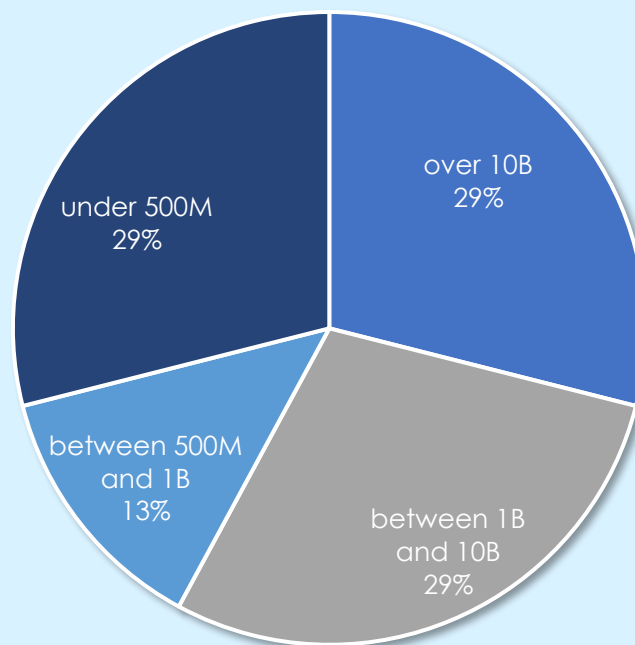
# Number of listed space companies and distribution

# of listed space stocks

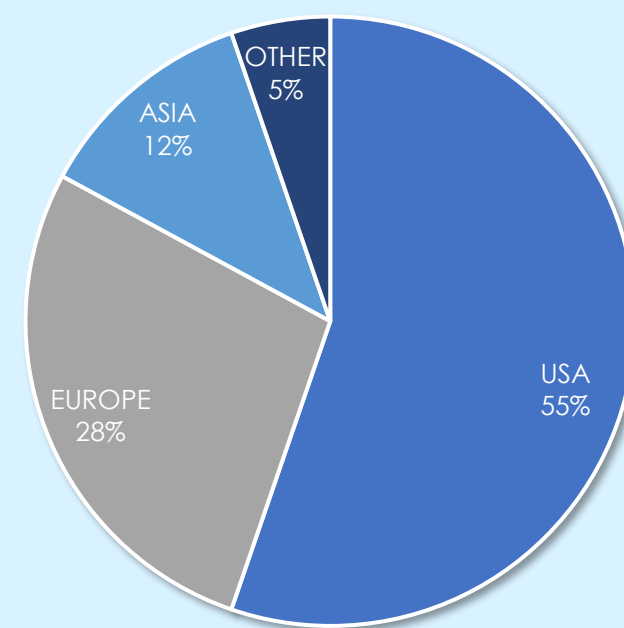


- \* Growing number of listed companies
- \* Diversification of market cap distribution
- \* Over 70% of what we consider "pureplay" stocks

Market Cap Distribution



Geographic Distribution



Source: Bloomberg, BlueStar IM. Updated in May 2022.



## 4 Space Economy Segments

### LAUNCH INDUSTRY AND SPACE INFRASTRUCTURE



- LAUNCH INDUSTRY
- SATELLITE MANUFACTURING
- SPACE EXPLORATION
- SPACE INFRASTRUCTURE

### CONNECTIVITY



- SATELLITE OPERATORS
- BROADCASTING
- INTERNET
- 5G
- IoT

### SPACE DATA



- SPACE DATA AS A SERVICE
- EARTH OBSERVATION
- GPS/GNSS
- NEW TECHNOLOGIES

### SPACE ECONOMY ENABLERS AND BENEFICIARIES



- PRECISION AGRICULTURE
- MAPPING/LOCALISATION
- AUTONOMOUS DRIVING
- ENABLING TECHNOLOGIES





## BlueStar IM

# Investment Team

## Exoplanet



Juan Luis Mallo

### Fund Manager -Head of Institutional Portfolio Management

Juan graduated in Economics, with a Master's degree in Finance at Università della Svizzera italiana, Lugano. Having co-founded BlueStar with the other partners in 2016, Juan is in charge of the Institutional Portfolio Management area. He started managing portfolios in 2004 and is currently the fund manager of BlueSpace Fund and other strategies.



Mario Cribari

### Head of Investment Strategy and Research

Mario graduated in Political Economy at Università Cattolica, Milan, and later obtained a Master's degree in Economics and Finance from Università Federico II, Naples. He is a CFA charter holder. Mario provides top-down, macro and thematic analysis, and has been following the aerospace industry since 2001. Mario co-founded BlueStar, as a partner, in 2016.



Giulia Comerio

### Portfolio Manager

Giulia graduated in International Economics of Financial Markets at University of Trieste, and subsequently obtained a Master's degree in Banking and Finance from Università della Svizzera italiana, Lugano. Giulia is specialised fund analysis with a particular focus on thematic research, coupled with strong portfolio management and construction skills. She joined BlueStar in 2017.



Patrick Borradori

### Head of Risk Management and Compliance

Patrick graduated in Economics at Università della Svizzera italiana, Lugano, where he also completed a Master's degree in Finance. He's in charge of the Risk Management and Compliance area and helps the investment team with deep portfolio analysis in terms of risk exposures. Patrick joined the team at the outset in 2016 and is partner of BlueStar.



Roberto Battiston

**Roberto** received a degree in Physics from the Scuola Normale University of Pisa and a Doctorate from University of Paris IX, Orsay. Roberto is full Professor of Experimental Physics in the Physics Department of the University of Trento. He was President of the Italian Space Agency from 2014 to 2018.

For more than 35 years he has been active in the area of international collaborations in experimental physics.



Alessandro Golkar

**Alessandro** trained at the Massachusetts Institute of Technology (MIT, USA) and the "La Sapienza" University in Rome, he has been Associate Professor and Director of Technological Development at the Skolkovo Institute of Science and Technology in Moscow, since 2012. He has 14 years of experience in the space sector as an academic (USA, Russia), corporate executive and startup advisor.



Andrea Cafagna

**Andrea** is an aerospace engineer. A graduate of the Politecnico di Milano, he was a researcher from 2014 to 2017 at INFN, the Italian Nuclear Physics Institute, Chinese office in Beijing. He was subsequently Business Development Manager for SITAEL S.P.A., a company which specializes in space technologies for smallsats, electric propulsion, and space stations. He is an ESA collaborator.



Andrea Parlange

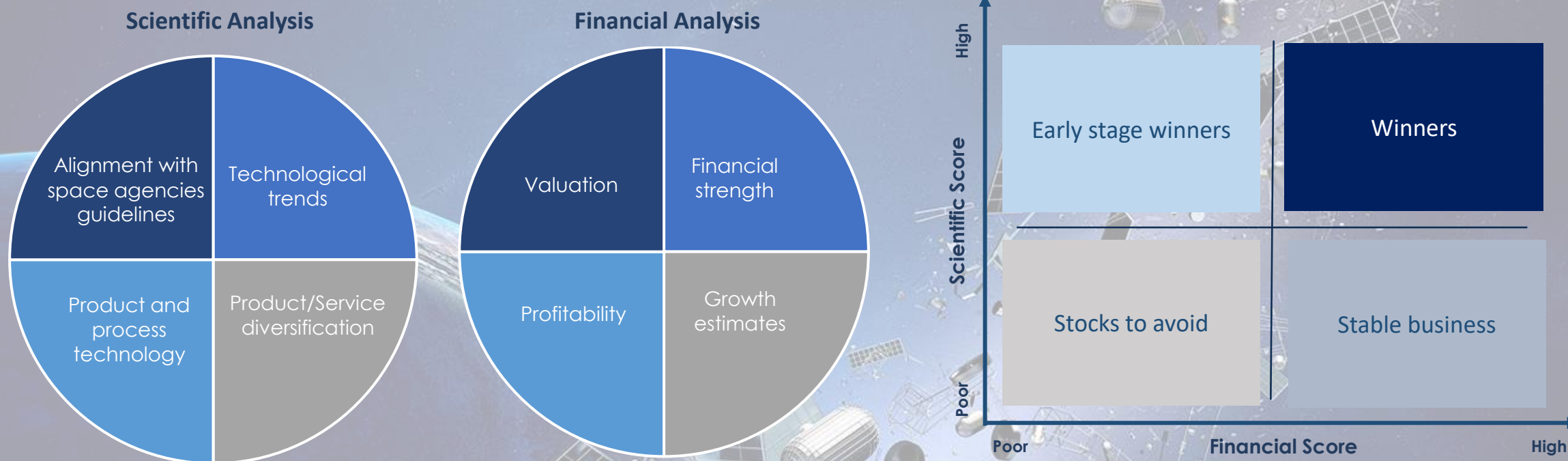
**Andrea** is a physicist (PhD) and journalist, managing editor of the monthly magazine Focus (Mondadori Scienza S.p.A.). He graduated in physics at Scuola Normale Superiore, in Pisa and he received his doctorate at Radboud University in the Netherlands. In 2019 he obtained an Executive MBA at the MIP Politecnico di Milano. He has written and edited several books.



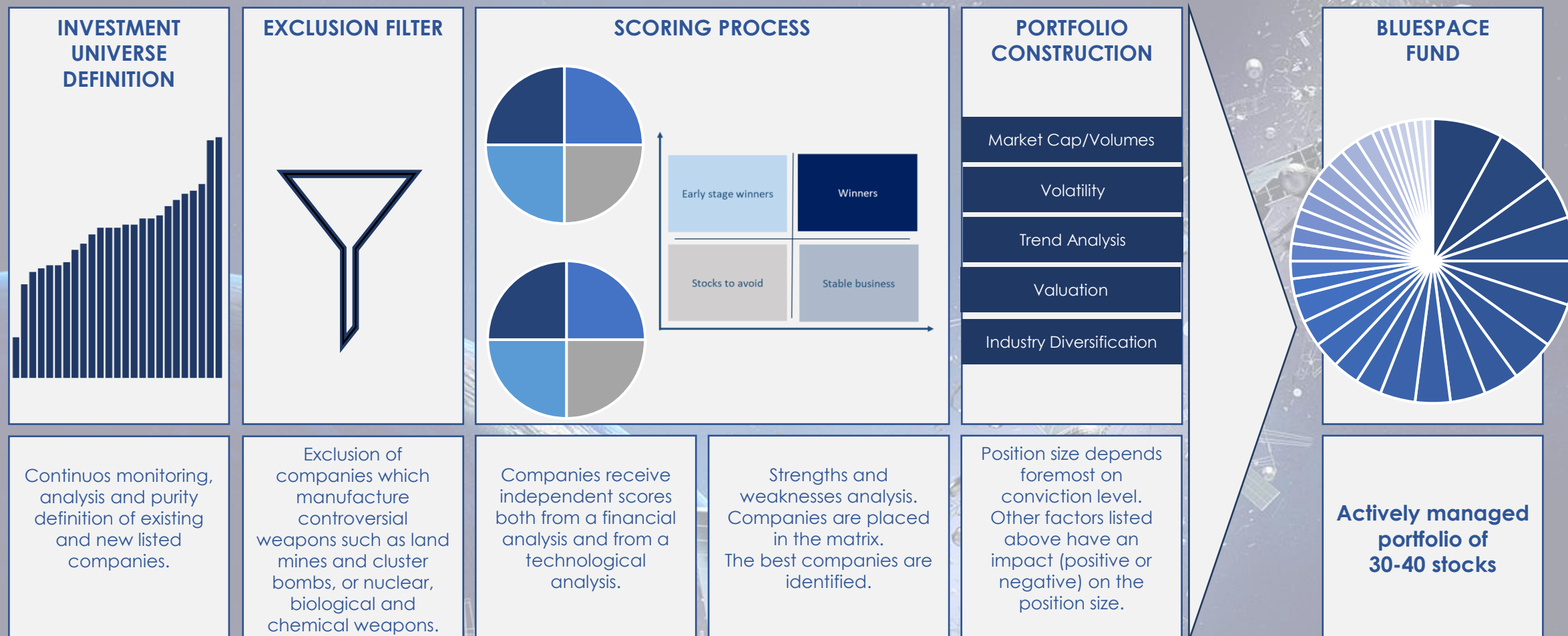
# Investment Process

The construction of the investible universe is the direct result of research conducted on a regular basis by members of the investment team. The companies included in the investible universe are analysed independently both from a technological and scientific point of view as from a financial point of view.

The overlap of the two scoring methods places the company in the following matrix:

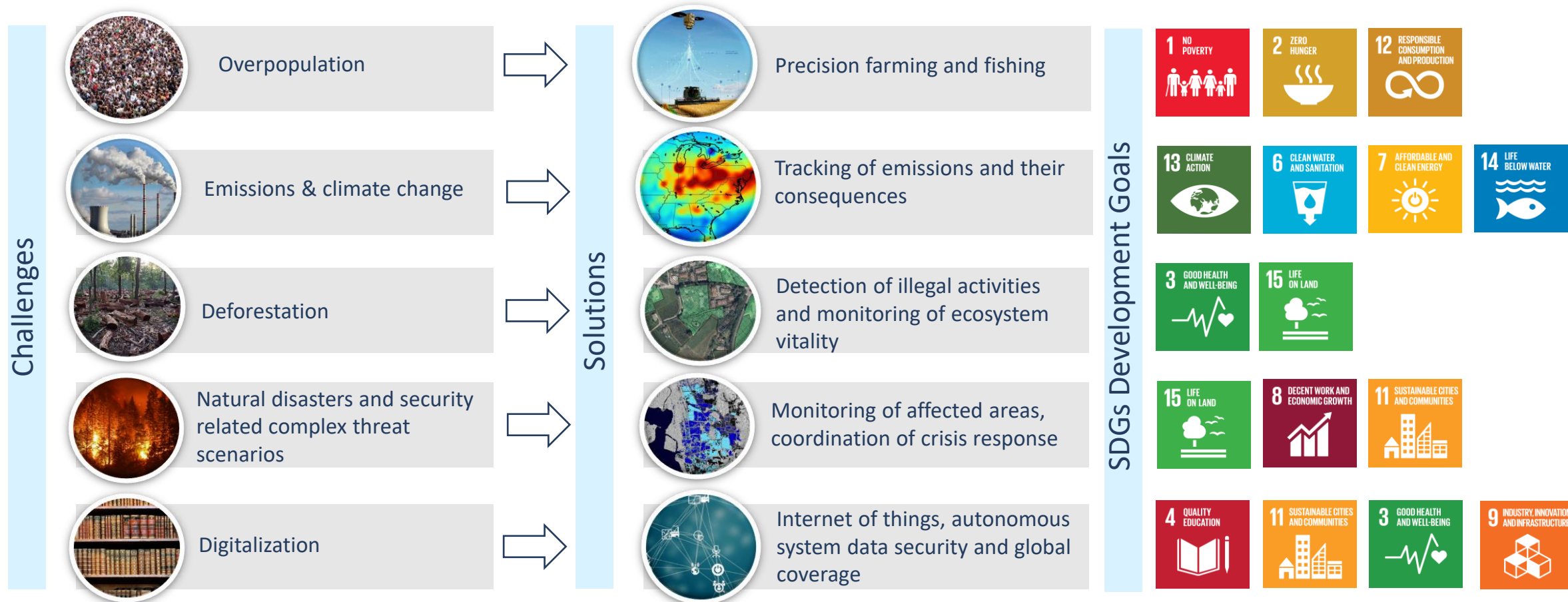


# Investment Process





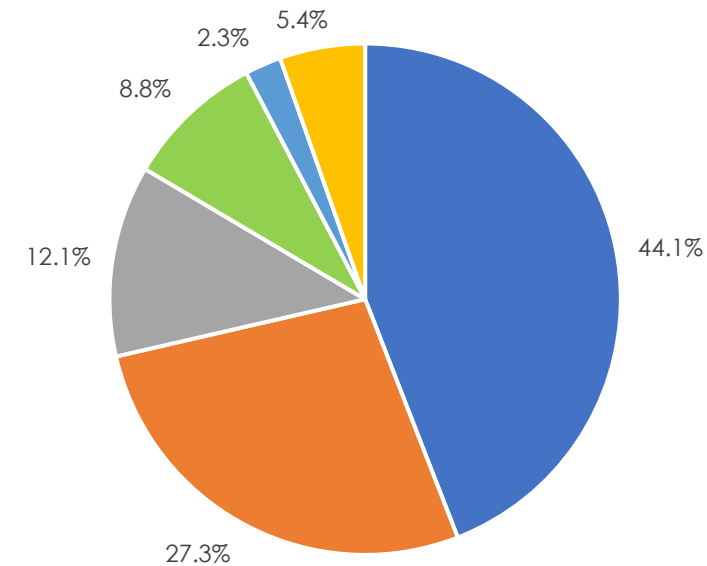
# Space solutions to major global challenges



Source: Delivering on strategy «OHb 2025» – OHb – February 11 2021;  
 Source: <https://www.unoosa.org/oosa/en/ourwork/space4sdgs/index.html>

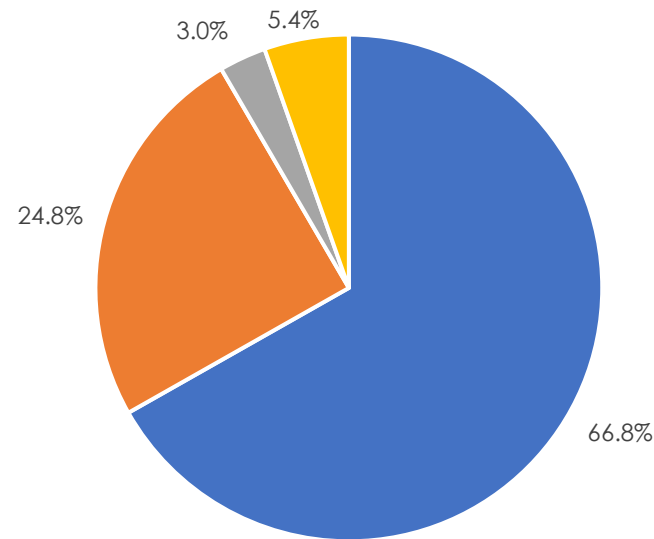
# Portfolio

GICS Sector Breakdown



- Industrials
- Telecommunication Services
- Information Technology
- Consumer Discretionary
- Other
- Cash

Geographical Breakdown



- North America
- Europe
- Asia
- Cash

**AuM: USD 15.5mln**

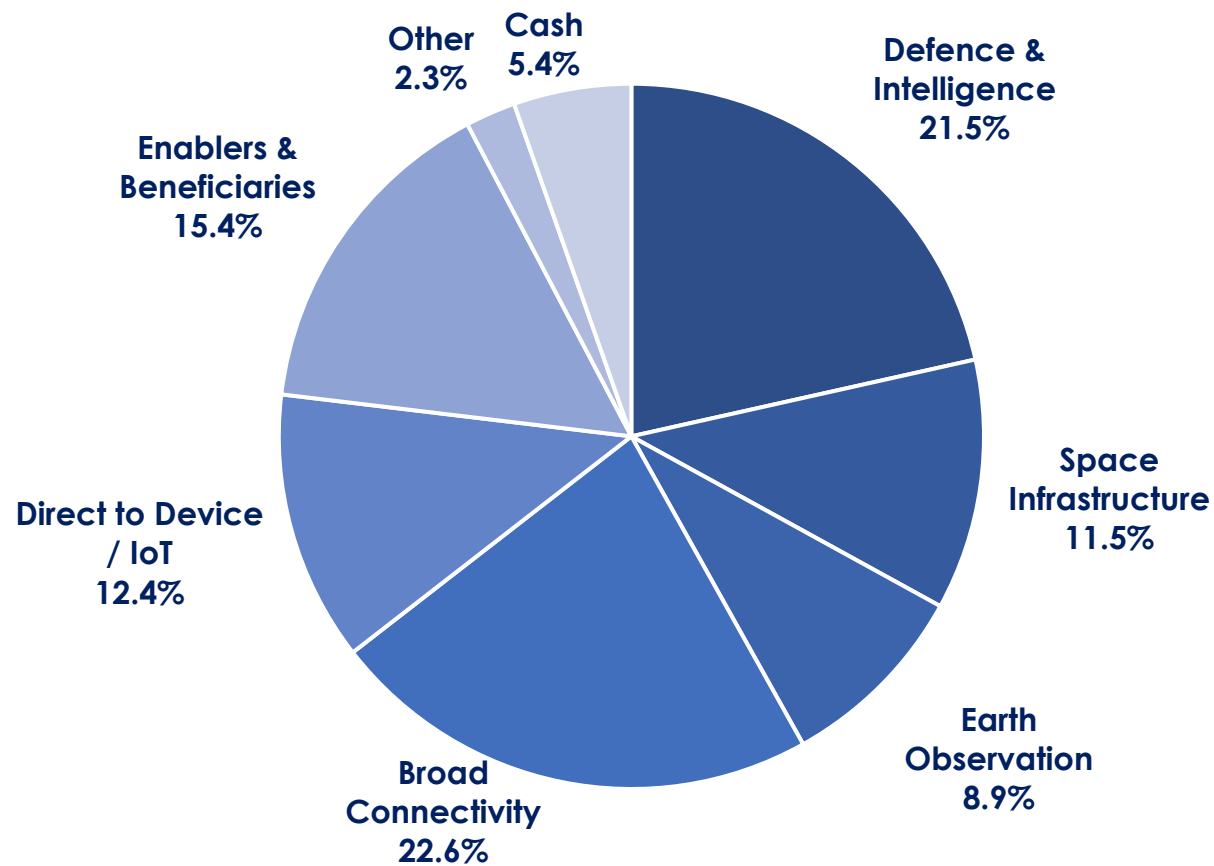
## Top Ten Holdings:

Planet Labs	5.1%
SES	4.8%
Iridium	4.6%
Amazon	4.5%
Garmin	4.3%
Eutelsat	3.8%
Airbus	3.7%
Thales	3.6%
Viasat	3.2%
Redwire	3.1%
BAE Systems	3.1%

As of 2023, April 28th

## Space Growth Themes

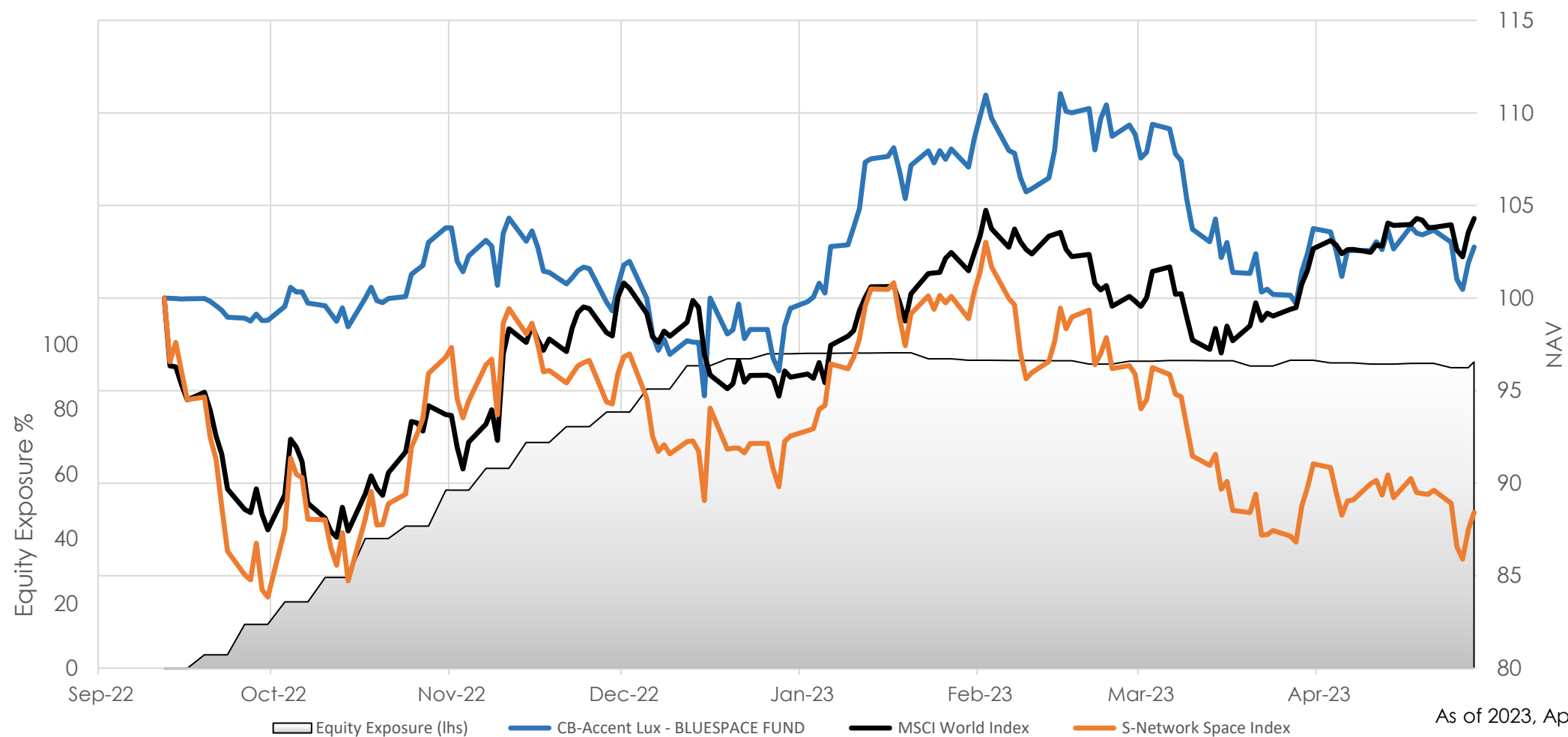
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As of 2023, April 28th



# Performance



As of 2023, April 28th

# Why invest in BlueSpace Fund



**Experienced investment  
management team**



**International  
technological advisory  
team**



**Pureplay investment in  
the space economy**



**Access to the  
New Space Economy**



**Support the UN Sustainable  
Development Goals**

- ★ Strong upside: the space sector is at the beginning of a new strong upside trend that will last decades.
- ★ Disruptive tech: new technologies, applications and services are growing as lowered launch costs permit a democratized access to space.
- ★ Space is everywhere: it is involved in the most important future trends like new connectivity, 5G-Internet of Things, autonomous driving, climate change, national security, cybersecurity, etc.
- ★ Investment process that couples financial analysis with a technological scoring provided by a leading scientific advisory board.
- ★ Pureplay, focused space fund.

# CASE STUDIES

## BLUESPACE FUND

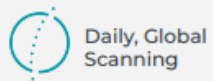
BLUESTAR  
Investment Managers



# Planet Labs



UNIQUE  
DATA



High Resolution  
Tasking

LARGE  
ADDRESSABLE  
MARKET



AGRICULTURE



DEFENSE &  
INTELLIGENCE



CIVIL



TECHNOLOGY &  
SERVICES



NATURAL RESOURCE  
MANAGEMENT



ENERGY



FINANCE



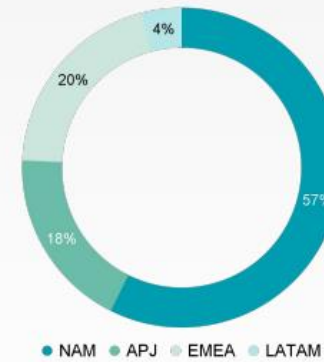
INSURANCE

HIGHLY SCALABLE  
BUSINESS MODEL

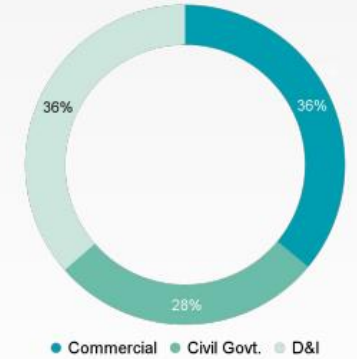


One-to-Many Model

FY23 Revenue  
by Geography



FY23 Revenue  
by Customer Type



Annual Revenue (\$ in millions)



## Planet Labs

### Tracking the Chinese Balloon

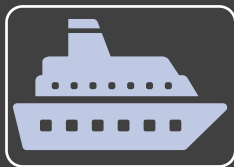
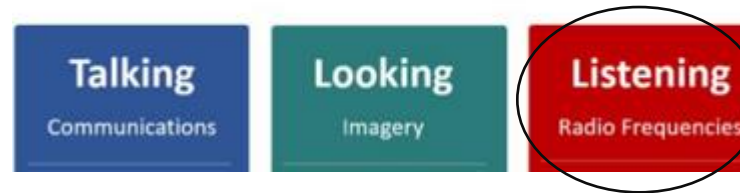
AI startup Synthetiaic used Planet's satellite data archive, model wind data (colored lines), and machine learning to trace the Chinese balloon from North America to its origin on Hainan Island.

The balloon was successfully identified by Synthetiaic's efficient machine learning algorithms within a large search area.



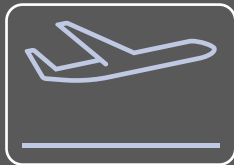
# Spire Global

## Three Unique Satellite Categories



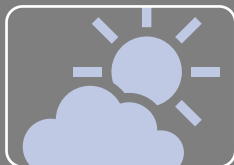
### Maritime

AIS data from ships. Tracking, route optimisation, supply chain and port operations, ship safety, illegal activities monitoring.



### Aviation

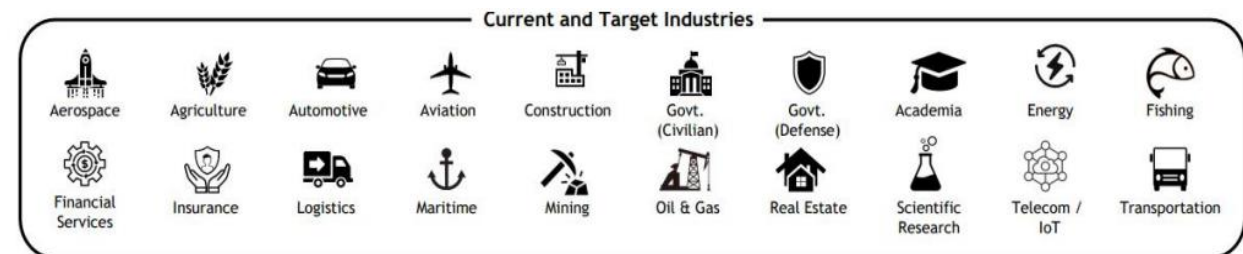
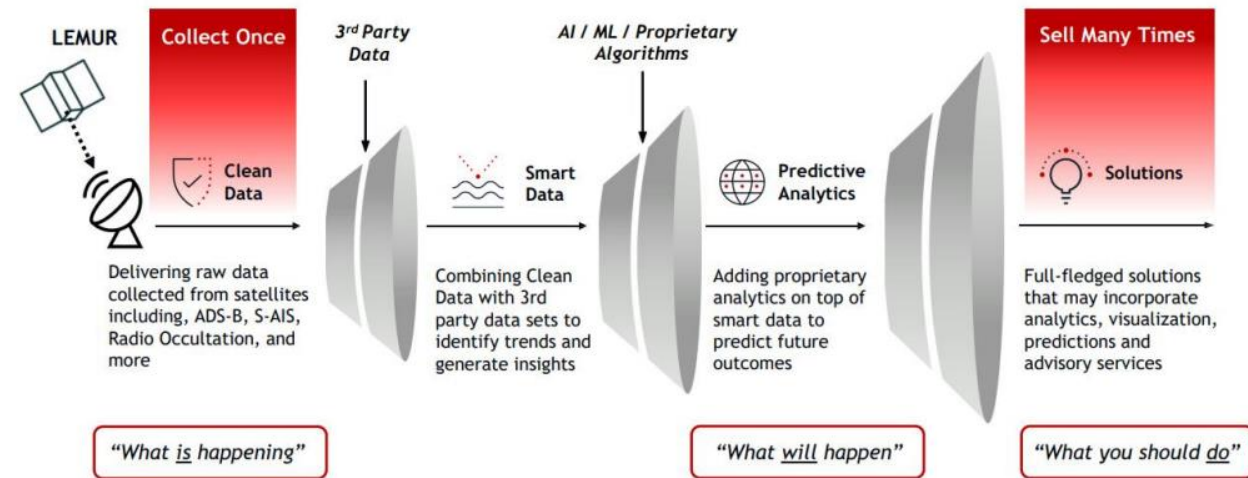
ADS-B data from aircrafts. Flight tracking, ETA and data for airport operations and logistic companies, analysis of air cargo capacity.



### Weather

AI powered predictive weather analytics with space-based data. Radio occultation data from GNSS to obtain real time information like temperature, humidity, pressure from every layer of the atmosphere.

Weather forecasting, asset protection, optimize crop yields, reducing losses and insurance, minimize supply chain disruptions.





# Spire Global

## Supported by Massive Global Trends Driving Demand

### Climate Change

#### Global Economic Losses from Weather-related Disasters (2021 USD Billions)



Global economic costs from weather-related disasters (adjusted for inflation) from 1950-2021. Damages in 2021 were the third highest on record. Image credit: Aon 2021 Annual Report

### Global Security



Geopolitical events



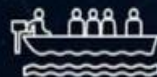
Increasing sanctions

>300% increase since Ukraine invasion



Illegal, unreported, and unregulated fishing

Up to \$50 billion annual economic loss



Piracy

\$16 billion annual economic loss



Dark Shipping

### Annual Recurring Revenue and Customer Evolution

ARR compounded annual growth rate: 109%

2022 net retention rate: 117%



# Share classes

SHARE CLASSES						
ISIN Code	Currency	Class	Investor Type	Management Fee	Performance Fee	Minimum Investment
LU2400604422	USD	A	Institutional	1.5%	10% HWM	100'000
LU2400604695	USD	B	Retail	1.5%	10% HWM	10'000
LU2400604778	USD	C	Institutional Expert	1.0%	10% HWM	5'000'000
LU2400604851	USD	D	Retail	2.0%	10% HWM	1'000
LU2400604935	USD	S	Institutional Expert	1.2%	none	10'000'000
LU2400605072	CHF (hedged)	A	Institutional	1.5%	10% HWM	100'000
LU2400605155	CHF (hedged)	B	Retail	1.5%	10% HWM	10'000
LU2400605239	CHF (hedged)	C	Institutional Expert	1.0%	10% HWM	5'000'000
LU2400605312	CHF (hedged)	D	Retail	2.0%	10% HWM	1'000
LU2400605403	CHF (hedged)	S	Institutional Expert	1.2%	none	10'000'000
LU2400605585	EUR (hedged)	A	Institutional	1.5%	10% HWM	100'000
LU2400605668	EUR (hedged)	B	Retail	1.5%	10% HWM	10'000
LU2400605742	EUR (hedged)	C	Institutional Expert	1.0%	10% HWM	5'000'000
LU2400605825	EUR (hedged)	D	Retail	2.0%	10% HWM	1'000
LU2405373890	EUR (hedged)	S	Institutional Expert	1.2%	none	10'000'000

# BLUESPACE FUND

## Characteristics:

- \* Long Only Equity fund
- \* UCITS V
- \* Luxembourg domicile
- \* Daily Liquidity
- \* Base Currency: USD
- \* Launch date: 12 September 2022

## Fund Structure:

- |                                   |                      |
|-----------------------------------|----------------------|
| * BlueStar Investment Managers SA | (Investment Manager) |
| * Exoplanet                       | (Scientific Advisor) |
| * CB-Accent Lux                   | (Sicav)              |
| * StateStreet Luxembourg          | (Custodian Bank)     |
| * Adepa Asset Management SA       | (Management Company) |
| * Ernst and Young                 | (Auditor)            |