





European Space Tech lifting off





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Intergovernmental organisation dedicated to the peaceful exploration and use of Space

The European Space Agency (ESA) is Europe's gateway to space. Its mission is to shape the development of Europe's space capability and ensure that investment in space continues to deliver benefits to the citizens of Europe and the world.

Established in 1975, European Space Agency includes 22 Member States. By coordinating the financial and intellectual resources of its members, it can undertake programmes and activities far beyond the scope of any single European country.

As part of its Agenda 2025, ESA intends to boost commercialisation of Space technology. ESA is working actively to open up to new European players helping them to innovate faster.

Learn more about

European Space Agency

Leading applied research and technology transfer foundation

The E. Amaldi Foundation was established on 28 March 2017 by the Italian Space Agency and the Hypatia Research Consortium, as an ambitious project that aims to propose a new way of interpreting applied research and technology transfer in support of the national scientific heritage.

The primary objective of the E. Amaldi Foundation is to promote and support scientific research aimed at technology transfer, starting from the space sector, as a fundamental tool for the country's economic development and as a source of innovation for improving competitiveness, productivity and employment.

Access to the Foundation is open to companies, research institutes and all those entities that wish to share scientific, economic and social objectives.

Learn more about

E. Amaldi Foundation

Global startup & venture capital intelligence platform

Dealroom.co is the foremost data provider on startup, early-stage and growth company ecosystems in Europe and around the globe.

Founded in Amsterdam in 2013, we now work with many of the world's most prominent investors, entrepreneurs and government organizations to provide transparency, analysis and insights on venture capital activity.







What is Space Tech?

Upstream Space Tech

The segment encompasses companies operating in space or developing products for space: developing and/or operating satellites, launch vehicles, developing spacecraft payloads and components, innovative materials for use in space, etc.

Some of the most innovative areas in this segment include technologies that can enable long-term human presence in space: space resource exploration and in-situ resource utilization, space utilities (in-space datacenters, power grids, etc.) and space habitats, as well as space tourism.

The segment also includes companies where space is not their core business. For example, 3D printing, advanced materials tech companies that target space among a number of other industries or those that have participated in space projects, or biotech companies that have sent experiments to space with the goal of exploring the potential use of their technology in space.

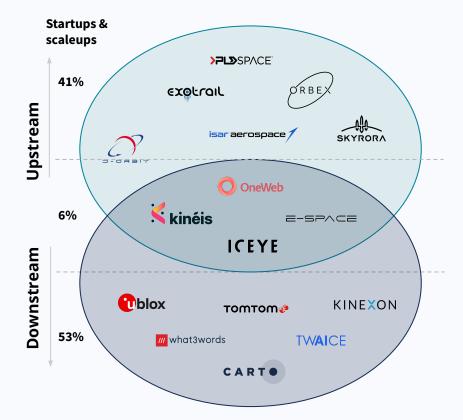
Downstream Space Tech

Downstream space sector encompasses technologies derived from space for use on Earth (e.g. materials and sensors originally developed for space but having found use in Earth-based applications) as well as technologies used in space with the main goal of serving Earth-based applications (mainly satellites: Earth observation, communication, navigation).

The segment also includes companies where space / space-derived tech is not their core tech. For example, companies that mention the use of satellite data among multiple other data sources.

Some companies belong to both Downstream and Upstream segments. For example, those operating their own satellites to deliver products / services on Earth (Earth observation satellite data for agritech, energy, etc.)

Some startups operate in both Upstream and Downstream sectors









European Space Tech overview - Upstream sector

Satellites

Earth observation

Designing, manufacturing and operation of Earth observation / remote sensing satellites





Communication / connectivity

Designing, manufacturing and operation of communication / connectivity satellites







Navigation

GNSS satellite systems (currently state owned), assistance in their operation, alternative PNT using satellites, etc.





Ground infrastructure

Ground segment (incl. Ground Segment-as-a-Service). ground-based antennas and related software, etc.z







Space transportation

Launch vehicles

Rocket-propelled vehicles to carry payload from Earth to space







In-space transportation spacecraft

Orbital transfer and in-space logistics vehicles, satellite deployers, separation systems, etc.







Stratospheric balloons & platforms

High-altitude balloons for space tourism as well as for uncrewed flights to carry payloads to space







Spaceplanes & hypersonic flight

Planes incorporating features of an aircraft and a spacecraft, some of which can travel at extreme speeds





Space exploration

Space resource exploration

Rover platforms, robotic explorers, etc. for Lunar, planet and asteroid exploration and in-situ resource utilization







Space utilities

In-space datacenters, power grids, lunar satellites, satellites for interplanetary communication/navigation, etc.







In-space manufacturing

Robotic assembly, additive manufacturing, etc. for in-space manufacturing, construction of spacecraft,







In-space human presence

Space habitats, space stations, greenhouses, etc. and tools to develop them on-site; in-space food manufacturing, etc.







In-space operations

Spacecraft servicing; space debris removal & recycling

In-space satellite inspection, relocation, de-orbiting, refuelling, etc.; space debris monitoring and removal







Mission planning & control

Tools enabling spacecraft autonomy, space traffic management and collision avoidance, etc.







In-space research

In-space research around materials, tissues, aging, diseases, etc., as well as tools and equipment enabling it





Cybersecurity for space missions

Technologies enabling cybersecurity of space missions, ground segment, ground/space communication links, etc.





Components & payloads

Spacecraft parts, structures & payloads

Main spacecraft parts and structures (e.g. satellite buses, actuators, etc.), as well as payloads (antennas, etc.)





mynaric

Propulsion systems

Propulsion technologies (chemical/electric, solid/liquid/hybrid, etc.) for space applications







Chips & sensors

Design, development, production of semiconductors tailored for space environment





Materials

Development and manufacturing of advanced materials for space applications











Space Tech for Earth applications - the Downstream European Space Tech sector.

Agriculture & food

Satellite communications for data transmission, Earth observation for monitoring of soil moisture & weather forecasts, satellite navigation for asset tracking, in-space research for studying plant growth & biology









Aviation

Satellite services for air traffic management, airline operational communications & passenger in-flight connectivity, airport management & meteorology; urban air mobility: reduction of environmental impact in aviation











Culture & entertainment

Satellite technologies for content apps (e.g. location tracking in photo apps, earth observation data for content creation), gaming (e.g. enhancing AR/VR experiences), sports (acquiring 3D navigational data), etc.









Education

Satellite connectivity enabling access to online education around the world, including rural areas and developing countries.



-AMBASAT

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kitsat







Energy

Space-based data for mapping and measuring wind, wave, tidal and solar resources; satellite communications, navigation and Earth observation for the hydrocarbon and nuclear sectors; in-space research to study heat transfer processes.





Environment

Satellite technologies to monitor the essential climate variables, support in ocean conservation and restoration of land and forests, to assist companies in monitoring their environmental footprint & ESG compliance.







kanop TESSELO

Finance

Satellite data for investment evaluation, risk assessment, event impact assessment. real-time asset/portfolio monitoring, carbon offsets auditing, etc.







Tourism

Satellite technologies for

intelligent routing and smart

guides, up-to-date maps and

weather reports.

high-resolution imagery for

3D views & digital panoramas

for marketing, data on tourist

flows.





Health

Satellite tech for telemedicine & digital monitoring devices and for enabling the concept of One Health: research in microgravity (tissue engineering, cancer research, etc.) for health technology improvements









Maritime

Satellite technologies for maritime surveillance and safety/emergency response, transportation, all aspects of marine life and environment. aquatic-life monitoring. aguaculture & fisheries.















Materials, mining & manufacturing

Satellite tech for site monitoring and connectivity at industrial plants and mining/construction sites: the use of advanced materials developed for space in Earth applications: in-space research leading to new achievements in industrial tech.









Mobility

Satellite navigation and connectivity for mobility and logistics and freight systems (e.g. for smart traffic management, goods tracking and connecting infrastructures)











Security & safety

Space-based services and satellite technologies for maritime surveillance, border control, disaster preparedness. emergency response, critical infrastructure management. secure communications, humanitarian operations, etc.











Smart cities

Satellite connectivity for grid management (waste management, etc.), navigation for transport information & traffic modelling, Earth observation for urban planning & urban agriculture, etc.



















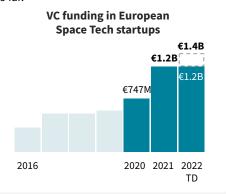


Key takeaways.

2021 was a record year for European Space Tech, and 2022 is on track to surpass it.

VC investment in Upstream Space Tech startups has reached €527M in 2022 so far excluding megarounds, on track to surpass last year all-time-high. Communication and connectivity satellites has been the most funded Upstream segment.

These investments are also having a large impact on the Downstream sector. Downstream startups working with ESA raised €709M in 2022 so far.

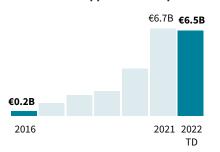


ESA plays a central role in boosting the Space Tech ecosystem in Europe.

ESA is supporting the Space Tech ecosystem with initiatives ranging from incubation, networking and investor access to research, engineering, facilities and technical support.

ESA BIC, the largest network of space incubators in Europe, has backed companies which are now worth €6.5B up from just €0.2B in 2016. ESA BIC is supported by local partners such as the E. Amaldi Foundation in Italy.

Combined enterprise value of ESA BICs supported startups



The Italian startup Space Tech ecosystem is starting to grow.

The combined enterprise value of Italian Space Tech startups has now reached €852M, up 18% from last year.

Italian Space tech startups have also raised €92M since 2016. However Italy has still much room to grow. It ranks in fact 4th in Europe by the number of Space Tech startups, but only 11th by VC funding raised.

Combined enterprise value of Italian Space Tech Startups

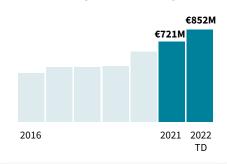






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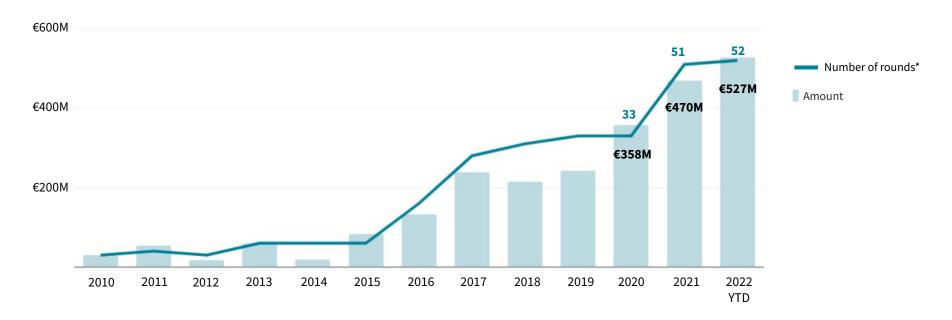
1

Space Tech and venture capital in Europe

With €527M to date, VC investment in European Upstream Space Tech has already exceeded the 2021 level. This is excluding megarounds.

VC funding in Upstream Space Tech startups & scaleups, excluding megarounds (€100M+)

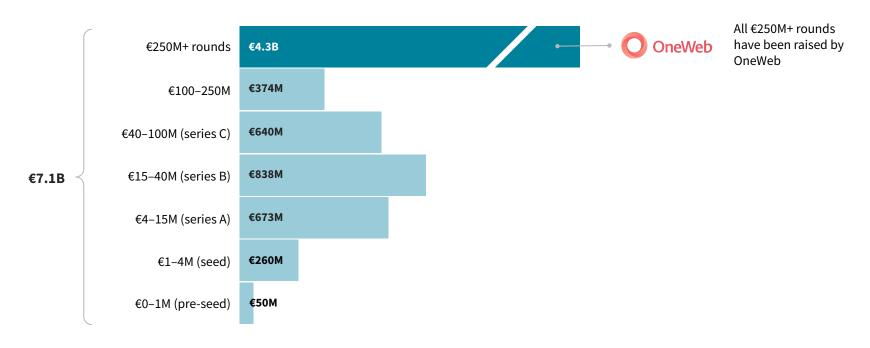
» view online





When including mega-rounds, €7.1 billion has been invested in European Upstream Space Tech since 2010.

European Upstream Space Tech VC funding by stage (2010-2022 YTD)



When including adjacent Downstream Space Tech companies, VC investing already matched last year's total with €1.2 billion.

VC funding in Space Tech startups & scaleups, excluding megarounds (€100M+)

» view online

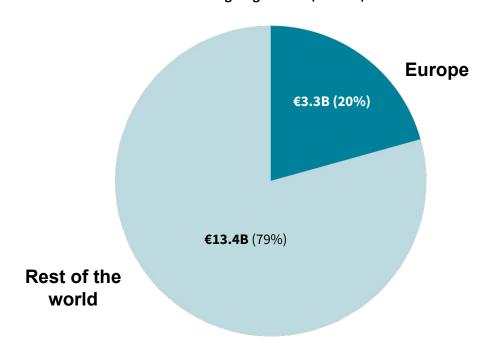






Europe accounted for 20% of the global VC investment in Upstream Space Tech in 2020-2022.

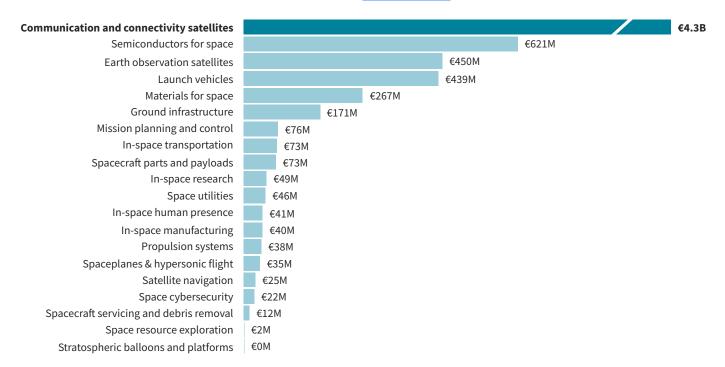
VC funding in Upstream Space Tech by startup HQ location (2020-2022), including megarounds (€100M+)



Communication and connectivity satellites have been the most funded segment in Upstream Space Tech in Europe, followed by Semiconductors for space.

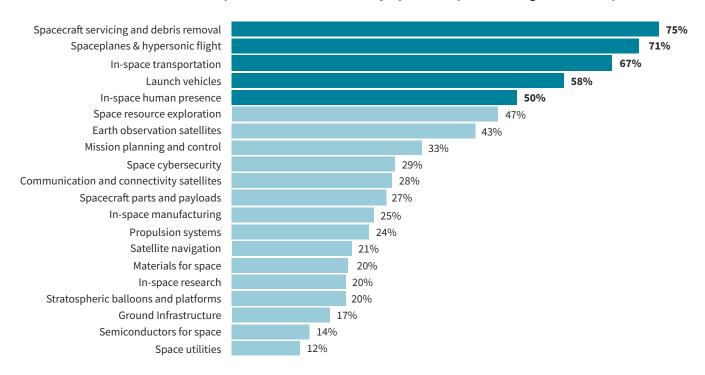
VC funding in Upstream Space Tech segments in Europe (2016-2022 YTD)

» view online

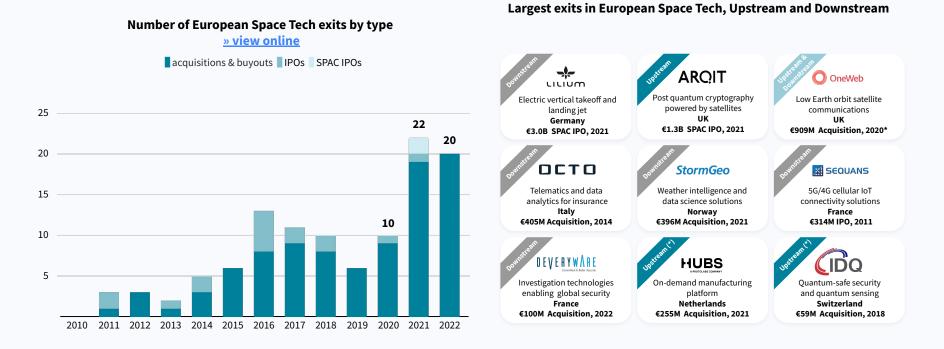


Spacecraft servicing and debris removal, spaceplanes & hypersonic flight, in-space transportation, launch vehicles and in-space human presence are emerging segments in Upstream Space Tech.

% of startups established after 2018 by Upstream Space Tech segment in Europe



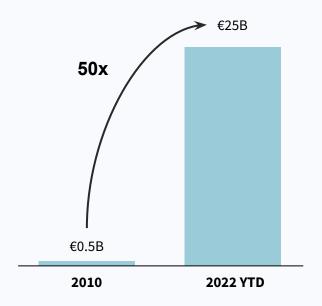
Exits in European Space Tech are slowly ticking up in 2021-2022, with notable SPAC IPOs of Lilium and Argit and acquisitions such StormGeo and Deveryware.



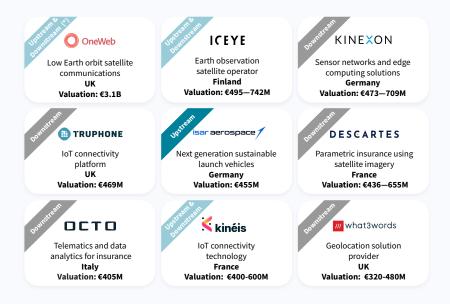


Meanwhile, the combined enterprise value of privately owned Space Tech startups in Europe has grown to €25 billion, up 50x from 2010.

Combined enterprise value of privately owned Space Tech companies in Europe <u>wiew online</u>



Most valuable private European Space Tech startups & scaleups



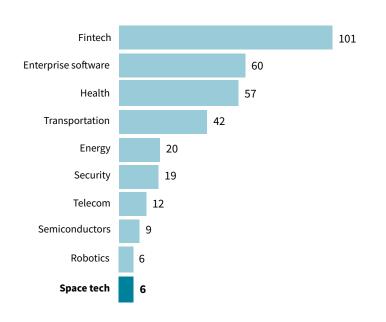






European space tech has created only a few unicorns, compared to other industries.

Unicorns created in Europe per industry



Of them, the majority operate in the Downstream sector.

European unicorns in Upstream and Downstream space tech » view online









Aside from the big exits and known unicorns, there is a strong pipeline of rising stars and future unicorns.

Upstream/Downstream Upstream Downstream isar aerospace 1 KINEXON /// what3words CARTO Kinéis Beacon **Future unicorns** DESCARTES \$250-999M TRUPHONE **=-5P/CE** SATREV TWAICE C CAPMO TEKEVER SKYRORA aerospacelab **Rising Stars** Skyports LiveE3 KAYRROS <\$250M

SATELLITEVU

Streetbees

Sylvera

w unseenlabs

Total value: €22.5B » view online



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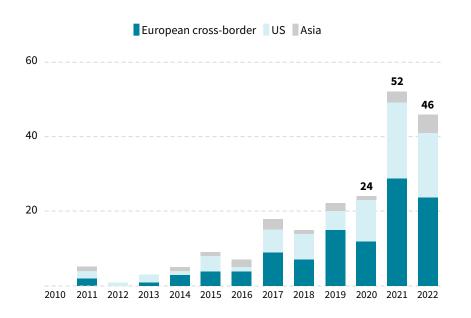
blackshark.ai

>**PLD**SPACE

NAWATECHNOLOGIES

Foreign investors are more active than ever investing in Upstream Space Tech, with 46 rounds so far this year.

European Upstream Space Tech rounds with a foreign investor <u>» view online</u>



Foreign investors that have invested in European Upstream space tech in 2021-2022

US investors





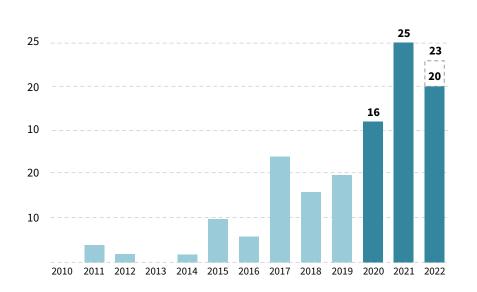






European Upstream Space tech has seen a meteoric rise in corporate investment last year. With 20 rounds to date, 2022 is on track to almost reach 2021.

European Space Tech rounds with a corporate investor » view online



Corporate investors that have invested in European Upstream space tech in 2021-2022

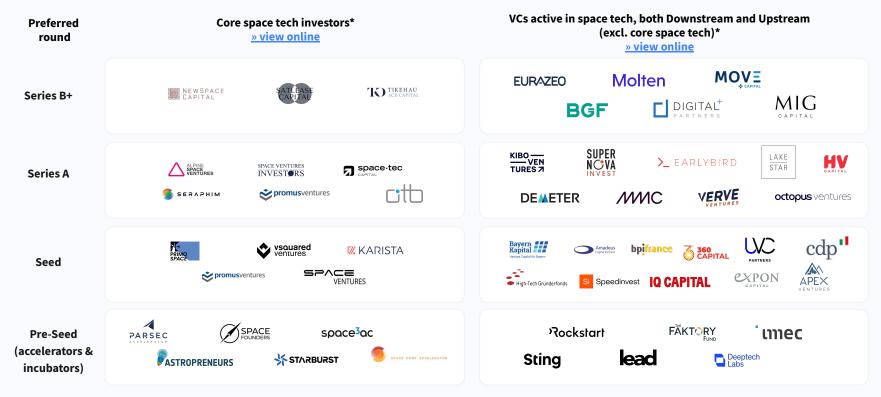






Notable European Space Tech investors.

Investors in European space tech







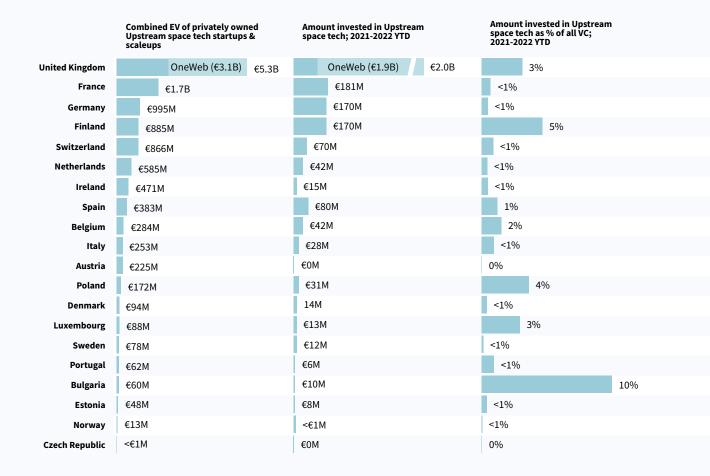


UK, France, Germany and Finland are the key hubs for Upstream Space Tech in Europe.

The UK boasts the most valuable Upstream space tech startup ecosystem. Its biggest player - OneWeb - with its €3.1B valuation, takes up nearly 60% of the entire ecosystem value.

Excluding OneWeb, UK runs 4th after France, Germany and Finland by the total amount raised in 2021-2022 YTD.

Among the biggest space tech ecosystems, UK and Finland have the highest % of VC funding going to Upstream Space Tech.







2

ESA's role in boosting space tech

ESA is supporting the Space Tech ecosystem with initiatives ranging from incubation, networking and investor access to technical support and research.

ESA BICs

The largest network of space incubators in Europe, supporting entrepreneurs who develop applications using space-based systems, use space technologies in a non-space domain, and/or develop innovative products and services for the space sector.

» Explore ESA BICs supported startups

ESA Network

The ESA network includes mature, startups, SMEs and service providers in the ESA member States, ESA Associate Members and participants under Cooperation Agreement and beyond. ESA cooperates with these companies in initiatives ranging from joint research to acceleration and incubation.

» Explore ESA Network companies

ESA SMEs

Companies that ever work for/with ESA as part of projects. ESA helps SMEs with training and technical support, consultation and policy implementation, networking, funding and more.

» Explore ESA SMEs

ESA InCubed

ESA division that aims to exploit and stimulate the favorable conditions of the European Earth observation market. The division creates or discovers new ideas, selects and nurtures the good ones, develops the corresponding solutions by maturing and testing them, and invests in the best ones via the InCubed programme.

» Explore ESA InCubed startups

ESA Investor Network

The network of investors cooperating with ESA on the basis of the Collaboration Agreements with several General Partners of Venture Capital Funds.

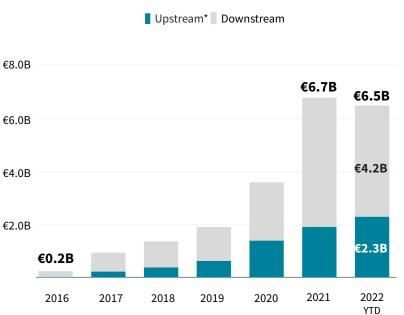
» Explore ESA Investor Network





ESA BIC - the largest network of space incubators in Europe - supports Space Tech startups, which are now worth €8.9B, up from just €0.2B in 2016.

Combined enterprise value of ESA BICs supported startups



Selected startups & scaleups in the ESA BIC network

» view online

Upstream

isar aerospace 1

Next generation rockets for sustainable access to space Germany Valuation: €455M

₹ 9T LABS

Advanced carbon composite manufacturing technology Switzerland Valuation: €62-93M

mynaric

Optical communications terminals Germany Valuation: €139M

ATLANT

Autonomous electronics component manufacturing Denmark Valuation: €55-82M

(unseenlabs

Satellite-based radio frequency (RF) geolocation of ships France

Valuation: €80-120M



transportation services Italv

Valuation: €40-60M1

Downstream

DESCARTES

Parametric insurance using

satellite imagery

France

Valuation: €436-655M

xsun

KINEXON

Sensor networks and edge computing solutions Germany

Valuation: €473-709M

stratio

Predictive fleet maintenance platform **Portugal**

Solar powered autonomous drones for earth observation France Valuation: €44-65M

Valuation: €21-32M

LILIUM Air taxi utilizing tech derived from space Germany

Valuation: €314M

ENTOCYCLE

Insect farming tech to produce Sustainable protein UK

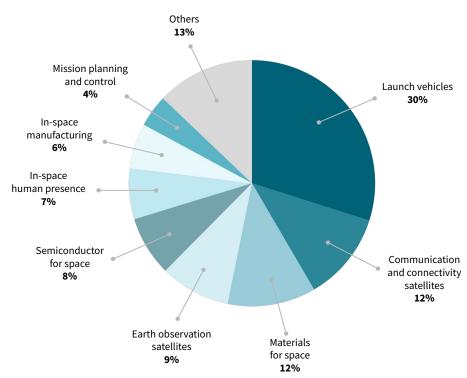
Valuation: €25-37M





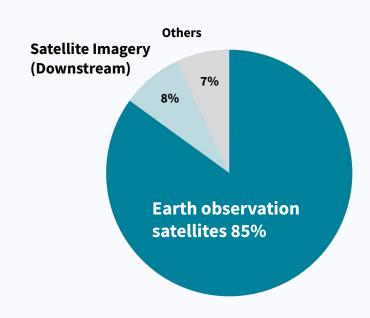
ESA BIC has supported Space Tech startups across a wide range of Upstream segments.

Combined funding 2016-2022: \$491M



The ESA InCubed programme was born to support Earth Observation, but is expanding into other areas of space activity.

Combined funding 2016-2022: \$202M





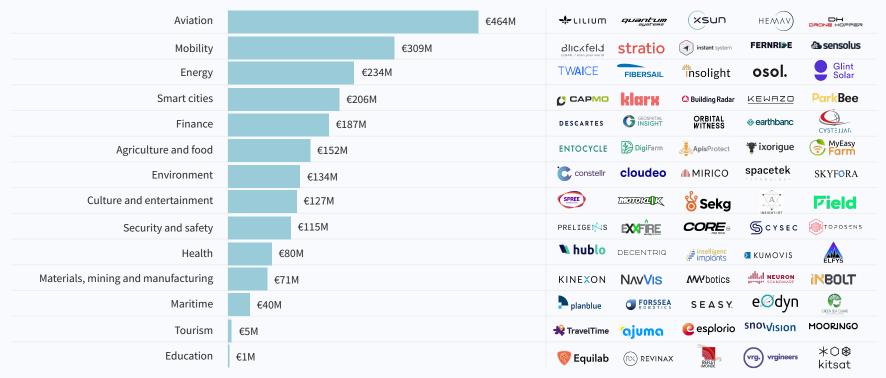


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Aviation leads the Downstream sector among ESA BIC supported startups in Europe, followed by Mobility and Energy.

VC funding raised by ESA BICs supported Downstream Space Tech startups

(2016-2022 YTD) <u>» view online</u>







Outside the ESA BIC, ESA is also supporting startups and SMEs located in Europe by working on joint projects and providing training, support, consultation and policy implementation, networking and funding.

Selected startups & scaleups in the ESA SME network* » view online



Upstream

ICFYF

Earth observation satellite operator Finland

Valuation: €495-742M



Micro-satellites for earth observation and imagery Belgium Valuation: €xxM

ALL SPACE

Optics technology for antenna-satellites communication

Valuation: €182M

SATREV

Developer of nanosatellites for Earth observation Poland

Valuation: €136M

ORBEX Launch vehicle developer and

operator Valuation: €194-291M

GHGSAT

Satellite-based GHGs detection system Canada

Valuation: €136M

With European office

planet.

Earth-observation satellites network

Valuation: €1.4B



Earth-observation nanosatellite network

Valuation: €181M

Upstream SatixFv

Satellite communication technology Israel

Valuation: €833M

ispace

Landers and rovers for lunar exploration Japan Valuation: €167-251M

Japan

servicing Valuation: €396-595M

★stroscale

In-space satellite operations &



Space-based cellular broadband network

Valuation: €159M

Downstream



Earth observation for climate and energy data analytics

France Valuation: €160-240M

分 FocalPoint

Next-generation navigation and positioning software UK

Valuation: €72-108M

Skyports

Infrastructure for urban air mobility

Valuation: €105M

GEOSATIS

Electronic monitoring solution For enhanced public safety Switzerland Valuation: €65-97M

LiveE(3)

Infrastructure monitoring solutions

Valuation: €76-114M

evolution 📦

Ouantum-safe cybersecurity products & services Canada Valuation: €20-30M

hiSky

Satellite communications network serving multiple industries Israel

Valuation: €109-164M

$\overline{\mathbf{v}}$

VALERANN IoT system for real-time traffic

> management Israel Valuation: €18-27M

Downstream



Al-based asset and vegetation intelligence

Valuation: €72-108M



Solutions for drone operators And airspace managers

Valuation: €545-818K



23 Hydrosat

Ground temperature analytics through satellite data

Valuation: €36-55M



Satellite connectivity platform

Valuation: n/a



The ESA investor network has expanded to include 21 venture capital funds to foster the commercialisation of the European space sector.

Investors with the largest number of space tech investments in the ESA Investor Network

Investor	но	Number of European space tech startups in the portfolio*	Selected space tech startups in the portfolio*				
promus ventures	Luxembourg	6	ICEYE	ALL.SPACE	The Exploration Company	www.wakeo	€lliPSIS DRIVE
™ KARISTA	France	5	SEQUANS	E exotrail	_{lean} space	\$ CYSEC	Miratlas
ARMILAR VENTURE PARTNERS	Portugal	2	Cintoo	neuraspace	outsystems		
PRIMO VENTURES	Italy	8	astrocast	PAPOGEO SPACE	LEAF A SPACE	D-ORBIT	PANGEA* AEROSPACE
EXPANSION AEROSPACE & DEFENCE VENTURES	Greece	5	share my space	((()) Latitude	ION∙X	HYPR SPACE	ZEPHALT O
LAKE STAR	Switzerland	5	isar aerospace /	constellr	Pic terra	Streetbees	1 TERALYTICS
cdp"	Italy	4	27 2-08917	SIDEREUS (*C	BIONIT LABS	o Greenβone	
TX) TIKEHAU ACE CAPITAL	France	5	HEXAGON	PRELIGE⊮S	<u>HQUANS</u>	new imagins reo-naucises	KALRAY THE POWER OF MORE
II HERIUS CAPITAL	Hungary	2	_{lean} space	OKAPI			

Explore the full ESA Investor Network <u>» view online</u>





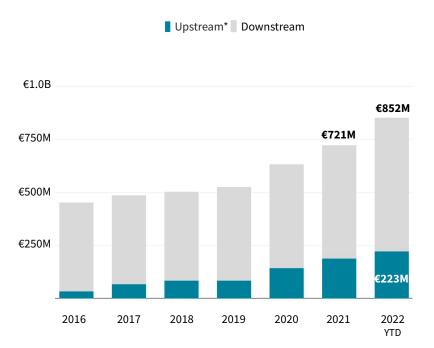


3 Italian Space Tech



The value of the Italian Space Tech startups keeps growing reaching €852M in 2022.

Combined enterprise value of the Italian Space Tech startups & scaleups by launch year » view online



Selected Italian Space Tech startups & scaleups

» view online

Upstream

Space logistics and orbital transportation services Est.: 2011 Valuation: €40-60M1

LEAF A SPACE

Operates a distributed ground station network Est.: 2014

Valuation: €20—30M

GreenBone Bone regeneration

technology Est.: 2015 Valuation: €40-60M

3D Printing of high-strength materials

Est.: 2014 Valuation: €13-20M

PAPOGEO SPACE

Aims to build a constellation of IoT connectivity nanosatellites Est.: 2015 Valuation: €20-30M

SIDEREUS (C)

Small, light and economical launch rockets Est.: 2019 Valuation: €7-10M

Downstream

DETO

Telematics and data analytics for insurance Est.: 2002 Valuation: €405M

$C \wedge R \wedge C \cap L$

Customized design-to-production 3D printing solutions Est.: 2017

Valuation: €14-21M

XFARM

Digital Farming Ecosystem using satellite mapping Est.: 2017

Valuation: €68-102M

GINOU-8

Enterprises Factory turning research into products Est.: 2015 Valuation: €34-50M

AI medical imaging for diagnosis and prognosis Est.: 2018 Valuation: €7-11M

waterview

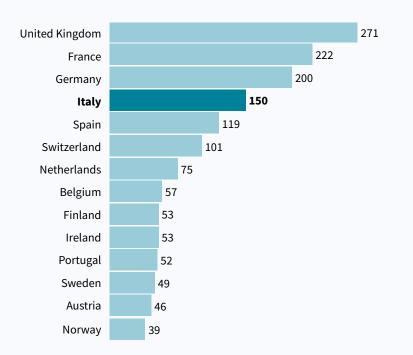
Weather big data collection & analysis from cameras Est.: 2015 Valuation: €4-7M





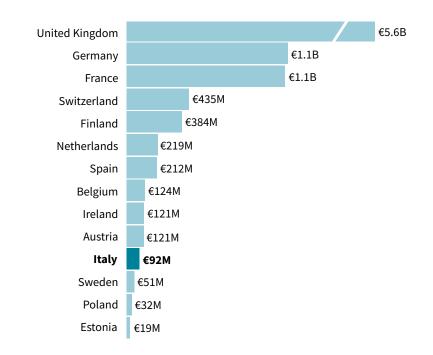
Italy ranks 4th in Europe by number of Space Tech startups ...

Number of Space Tech startups by startup HQ, founded after 2000



... but only 11th by VC funding in Space Tech startups.

VC funding in Space Tech startups by startup HQ 2016-2022 YTD* » view online







The majority of startups in the Italian Space Tech ecosystem that have been supported with grants and venture capital operate in the Downstream sector.





Turin

Rome



Piedmont region Space Tech ecosystem

Incubators & accelerators











Educational & research institutions

incubation centre

business

Technology leaders

ThalesAlenia





















Avio Aero»

Tyvak International





Government & non-profit institutions









Turin

Startups & scaleups (selected names)





























Lazio region Space Tech ecosystem

Incubators & accelerators & technology parks









Technology leaders

















ELEONARDO







Educational & research

























institutions























Turin



Government & non-profit

WUNINDUSTRIA



Startups & scaleups (selected names)

























Rome















Italian investors with Space Tech in their portfolios.









Explore the ecosystem **spacetech.dealroom.co**

Access over 3,900+ Space Tech startups, 3,800+ funding rounds, and our latest insights on the world of space.

» Visit the platform

Lead-initiator

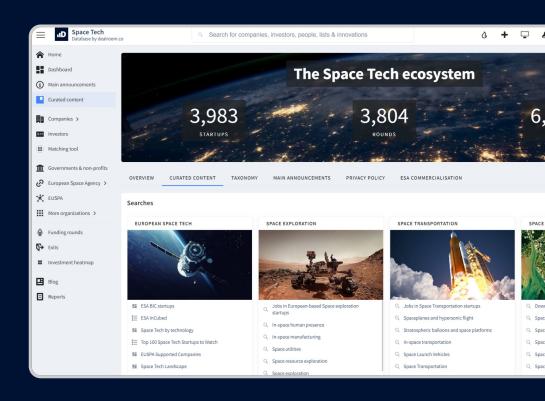


Co-initiator

Powered by







Venture capital methodology and definitions.

Startups, scaleups, grownups and tech

Companies designed to grow fast. Generally, such companies are VC-investable businesses. Sometimes they can become very big (e.g. \$1B+ valuation).

When startups are successful, they develop into scaleups (>50 people), grownups (>500 people) and result in big companies, like D-Orbit or Lilium.

Only companies founded since 1990 are included in this report.

Venture capital investment

Investment numbers refer to rounds such as Seed, Series A, B, C, late stage, and growth equity rounds.

Venture capital investment figures exclude debt or other non-equity funding, lending capital, grants and ICOs.

Buyouts, M&A, secondary rounds, and IPOs are treated as exits: excluded from funding data.

Investment rounds are sourced from public disclosures including press releases, news, filings and verified user-submitted information.

Valuation

The combined valuation of the tech ecosystem is based on their market cap or latest transaction value.

Transaction value is realized from exit or implied unrealised valuation from the latest VC round, which is either announced or estimated by Dealroom based on benchmarks.

Taxonomy

The space tech sector is broadly divided into Upstream and Downstream.

The space tech Upstream segment includes companies working directly in space activities (e.g. space exploration, space transportation, in-space operations)

The space tech Downstream segment includes companies applying space technologies in other industries on earth from agriculture to health, mobility (e.g satellite imagery applications, satellite localization services for mobility and navigation)

On the space tech ecosystem, you can find more details on the <u>full space tech taxonomy</u>.









