EU-funded space research

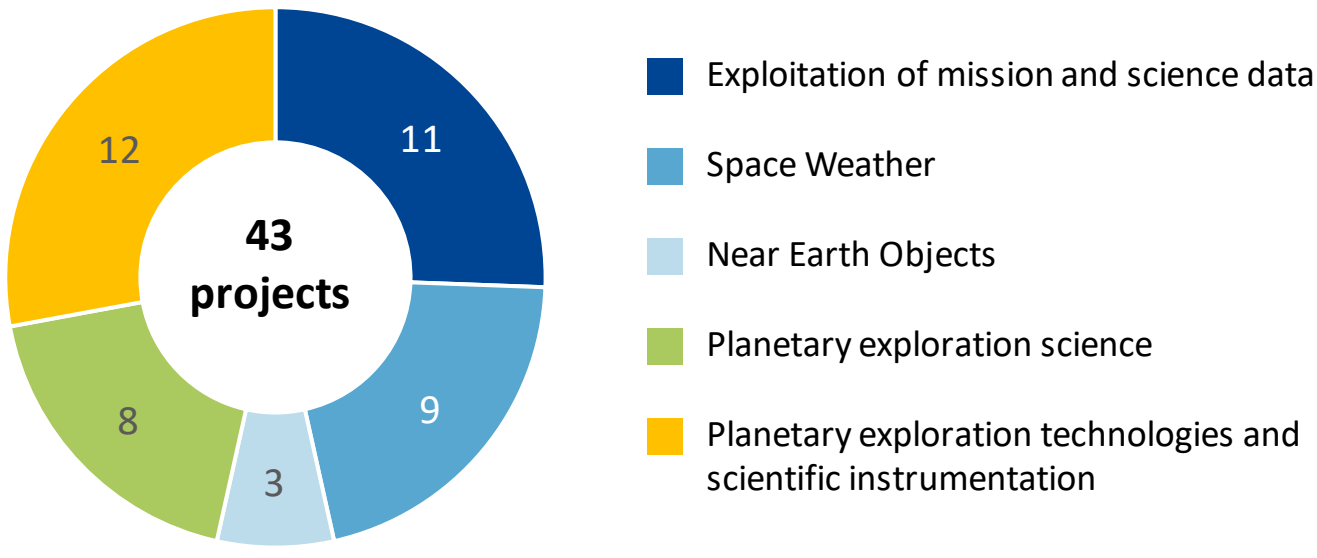
Space Science, Instrumentation and Exploration

Space Sciences are a fundamental part of the Strategic Research and Innovation Agenda (SRIA) for EU-funded space research. They contribute to the mid to long-term competitiveness in space by developing new concepts and technologies. The following domains are currently funded within Space Sciences:

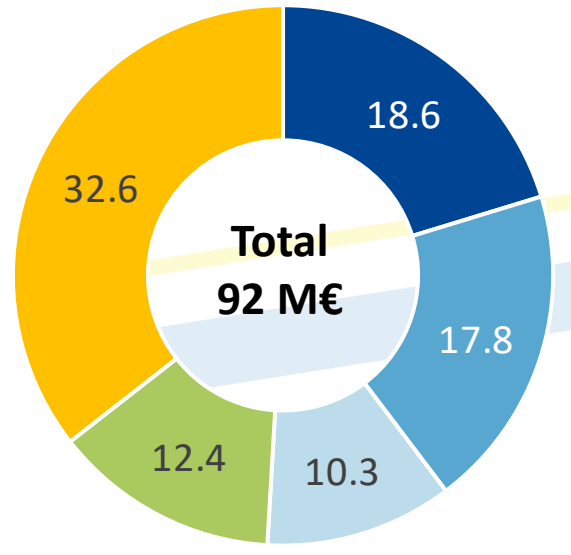
- **Exploitation of mission and science data**: the amount of scientific data and complexity of research questions increase rapidly
- **Space Weather**: Increasing solar activity, more technology in space, and a high dependence of society and economy on space infrastructure make the understanding and modelling of Space Weather a priority
- **Near Earth Objects (NEOs)**: NEOs can be a threat to Earth and have substantial implications for space mining
- **Planetary exploration science**: The answer to major scientific challenges
- **Planetary exploration technologies and scientific instrumentation**: Enabling future scientific, robotic, and human planetary exploration and space missions

In Horizon 2020 **43 Space Sciences projects** have been funded within the above described domains:

Number of projects
by domain 2014-2020

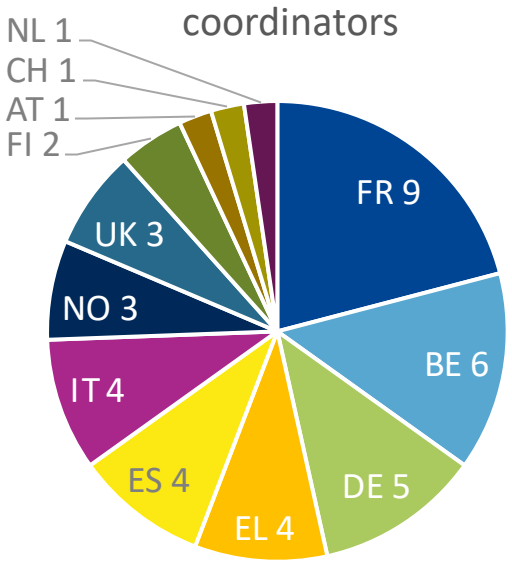


EC contribution
by domain in M€ 2014-2020

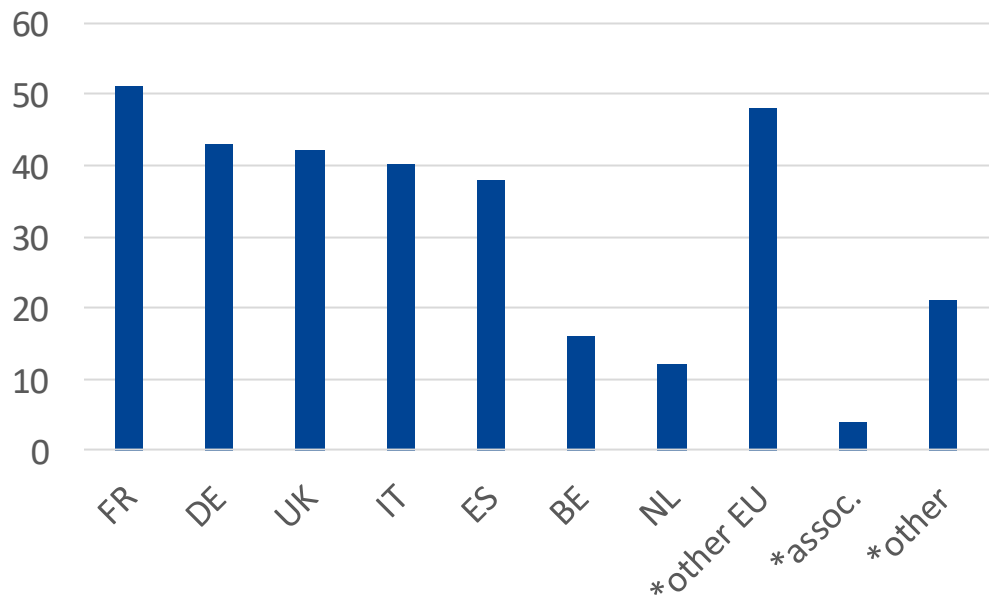


A total of 339 beneficiaries received funding:

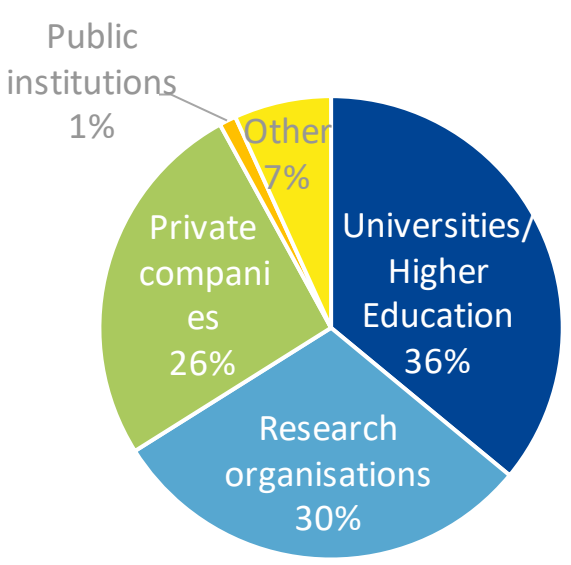
Country split of 43 project coordinators



Country split of 315 participants
(incl. associated & third countries, excl. coordinators)



% of beneficiaries by type



*other EU: AT, CZ, DK, EL, FI, HU, IE, LU, PL, PT, SE, SI
*associated: IL, NO
*other: AU, BG, CA, CH, CY, EE, JP, RO, RU, US

Prepared by STARS*EU, source: HaDEA, CORDIS, SRIA

EU SPACE

EU-funded space projects with focus on

Space Science, Instrumentation and Exploration – H2020 projects

Exploitation of mission and science data

Astronomy and Astrophysics

2016-2018, completed

RADIOFOREGROUNDS
1.5 M EUR
Providing the best characterisation of the physical properties of polarized microwave emissions
UK, IT, FR, **ES**

2016-2020, completed

StarFormMapper
1.8 M EUR
Combining Gaia & Herschel data with ground facilities to constrain massive star & star cluster formation mechanisms
NL, ES, FR, **UK**

2018-2020, completed

BeyondPlanck – 1.5 M EUR
Delivering state-of-the-art observations of the microwave sky from 30 to 70 GHz for the next decade
FI, IT, EL, **NO**

2018-2022, completed

AIDA – 1.5 M EUR
Employing Artificial Intelligence to the analysis of heliophysics data.
EL, IT, US, FR, NL, **BE**

2018-2022, completed

EWC – 1.6 M EUR
Enabling weak lensing cosmology by improving the modelling of astrophysical effects that affect the signal of Euclid
PT, NL, ES, IT, DE, FR, **UK**

2021-2023, ongoing

SHARP – 1.5 M EUR
Achieving a breakthrough in our understanding of collisionless shocks on the basis of comprehensive data analysis.
IL, SE, US, NL, **FI**

2021-2024, ongoing

XMM2ATHENA – 2.0 M EUR
Developing new software & methods need to be used by the next generation X-ray observatory, Athena
DE, ES, EL, UK, **FR**

2021-2024, ongoing

GaiaUnlimited – 1.6 M EUR
Determining the Gaia survey selection function and providing corresponding data and tools
UK, IT, US, AU, DE, **NL**

2021-2025, ongoing

NEMESIS – 1.7 M EU
Using AI for the interpretation of the largest, panchromatic data collection of young stellar objects to understand star formation
CH, HU, **AT**

Heliophysics

2020-2023, ongoing

EXPLORE – 2.0 M EUR
Gathering experts with different expertise to develop new tools for the exploitation of space science data
UK, DE, IL, LU, AT, **FR**

2021-2024, ongoing

SERPENTINE – 2.0 M EUR
Understanding the origin of Solar Energetic Particle events & provides a analysis platform for the heliophysics community
UK, DE, ES, FR, **FI**

Secondary focus | Space Weather

EU SPACE

EU-funded space projects with focus on

Space Science, Instrumentation and Exploration – H2020 projects

Space Weather

2015-2017, completed

FLARECAST – 2.4 M EUR
Development of an automated forecasting system for solar flares

IE, CH, UK, IT, FR, **EL**

2015-2017, completed

HESPERIA – 1.1 M EUR
Understanding the physical mechanisms that result into high-energy solar particle events

CH, DE, ES, BE, FR, FI, **EL**

2015-2018, completed

PROGRESS – 2.4 M EUR
Producing forecast tools for the occurrence and severity of space weather events

US, RU, DE, UA, SE, FI, FR, **UK**

2017-2020, completed

TechTIDE – 1.6 M EUR
Developing warning & mitigation technologies for Travelling Ionospheric Disturbances Effects

CZ ,ZA, BE, DE ,ES, FR, BG, CY, **EL**

2018-2021, completed

ESC2RAD – 1.3 M EUR
Modelling space radiation-induced effects on both biological matter and functional materials for spacecraft

ES, UK, FR, **BE**

2018-2021, completed

SWAMI – 1.2 M EUR
Providing a comprehensive representation of the neutral atmosphere from the surface to 1500 km altitude

UK, DE, FR, **ES**

2019-2022, ongoing

EUHFORIA_2.0 – 2.6 M EUR
EUHFORIA is a space weather modelling tool that computes the time-evolution of the inner heliospheric plasma environment

FI, DE, UK, US, ES, FR, **BE**

2020-2022, ongoing

SafeSpace – 3.0 M EUR
Advancing space weather nowcasting and forecasting capabilities and, consequently, at contributing to the safety of space assets

CZ, FR, ES, BE, **EL**

2020-2022, ongoing

Pager – 2.4 M EUR
Providing space weather predictions that will be initiated from observations on the Sun & will predict radiation in space & its effects on satellite infrastructure

CZ, US, UK, FR, **DE**

Near Earth Objects (NEO)

2015-2017, completed

NEOShield-2 – 4.2 M EUR
Studying physical & orbital properties of Near Earth Objects (NEOs) and develops technology for NEO impact prevention.

UK, IT, FR, ES, **DE**

2020-2023, ongoing

NEOROCKS – 2.1 M EUR
Studying the dynamical and physical properties of NEOs to determine their orbit and characterize their nature.

FR, PL, RO, ES, CZ, UK, **IT**

2020-2023, ongoing

NEO-MAPP – 4.0 M EUR
Studying the response of asteroids to ex-ternal forces (e.g. kinetic impacts) and its physical & dynamical properties.

ES, PT, LU, EL, CH, DE, BE, IT, **FR**

Secondary focus | Exploitation of mission and science data | Planetary exploration science

Prepared by STARS*EU, source: HaDEA, CORDIS

EU SPACE

EU-funded space projects with focus on

Space Science, Instrumentation and Exploration – H2020 projects

Planetary exploration science

2015-2018, completed

UPWARDS – 2.1 M EUR
Understanding the Mars water cycle, the exchange of gases between atmosphere & interior, dust storms & the subsoil
IT, BE, UK, FR, **ES**

2016-2018, completed

MiARD – 1.0 M EUR
Providing an integrated description of physical & chemical properties of comet 67P/Churyumov-Gerasimenko (Rosetta mission)
DE, UK, NL, FR, **CH**

2016-2018, completed

PPOSS – 1.0 M EUR
Contributing to the future of planetary protection policy related to the exploration of outer solar system bodies
IE, UK, DE, IT, **FR**

2016-2019, completed

SBNAF – 1.5 M EUR
Addressing critical points in reconstructing physical & thermal properties of near-Earth, main-belt, and trans-Neptunian objects.
PL, ES, HU, **DE**

2016-2021, completed

PTAL – 1.5 M EUR
Building & exploitation a multi-instrument spectral data base & interpretation tools to characterise the surface of planets.
ES, FR, **NO**

2018-2021, completed

PLANMAP – 1.5 M EUR
Providing geological maps of the 3 main bodies of interest for European space missions: Mars, Mercury & the Moon.
DE, UK, FR, **IT**

2018-2021, completed

ExoplANETS_A – 1.5 M EUR
Analysing the atmospheres of exoplanets by integrating models of star-planet interaction, atmospheric chemistry & planet formation.
AT, DE, UK, ES, NL, **FR**

2020-2023, ongoing

ROADMAP – 1.5 M EUR
Understanding the Martian atmosphere via laboratory studies, modelling of specific phenomena, data analysis, & global modelling.
DK, DE, ES, **BE**

Secondary focus

Exploitation of mission and science data

EU SPACE

EU-funded space projects with focus on

Space Science, Instrumentation and Exploration – H2020 projects

Development of instruments and technology (incl. robotics) for planetary exploration and space missions

Cutting-edge scientific instrumentation in support of space missions	Space exploration technology and human spaceflight	Robotic exploration	Exploration technology

2019-2021, completed

LUVMI-X – 3.0 M EUR

Development of a rover to search for water & other volatiles in polar regions of the moon for future human missions

DE, UK, NL, **BE**

2015-2018, completed

TIME SCALE

TIME SCALE – 3.8 M EUR

Bringing closed regenerative life support system to the next level by further development of the European modular cultivation system

NL, IE, BE, IT, DE, **NO**

2019-2021, completed

ADE – 3.0 M EUR

Developing a rover for data collection, autonomous long traverse surface exploration, & optimal exploitation of resources

AT, IT, DE, BE, FR, UK, **ES**

2015-2016, completed

IRENA – 0.8 M EUR

Creating a cluster of European & international stakeholders to develop entry/re-entry technologies

JP, IT, DE, EL, **FR**

2018-2022, ongoing

HERMES-SP – 3.3 M EUR

Developing CubeSats for the low Earth orbit to probe X-ray emissions of Gamma-Ray bursts and gravitational wave events.

SI, HU, DE, ES, **IT**

2015-2019, completed

EDEN ISS – 4.5 M EUR

Developing plant cultivation technologies & operations procedures for food production on-board the ISS & for future human space exploration missions

AT, IT, CA, NL, SE, IE, **DE**

2019-2021, completed

PRO-ACT – 3.1 M EUR

Developing 3 robots capable of cooperation & manipulation for assembling an in-situ resource utilisation plant on the moon

ES, UK, DE, PL, FR, **BE**

2015-2017, completed

EURO-CARES – 2.0 M EUR

Developing a European sample curation facility for samples returned from missions to asteroids, Mars, the Moon, and comets

DE, BE, IT, AT, FR, **UK**

2019-2023, ongoing

PIONEERS – 3.0 M EUR

Development of a new generation seismic instrumentation to analyse internal planetary structures during future planetary missions

DE, BE, CH, **FR**

2016-2019, completed

BIOWYSE – 3.0 M EUR

Developing a biocontamination control system for water & humid areas, habitat management, payloads, cargo & crew transportation elements

IT, DE, EE, CZ, UK, **FR**

2021-2023, ongoing

CoRob-X – 1.5 M EUR

Developing a multi-agent robotic teams for the exploration of planetary surfaces, with a focus on hard-to-reach areas

BE, NO, FR, ES, **DE**

2015-2017, completed

DEMOCRITOS – 1.0 M EUR

Investigating technologies that are necessary for high power nuclear electric propulsion

CZ, ZA, BE, DE, ES, FR, BG, CY, **EL**

Secondary focus

Exploitation of mission and science data