

ESA ASTRONAUT SELECTION 2021





Your way to space

#SpaceCare

CONTENTS

Your way to space	3
Who can apply?	4
Requirements to apply	5
Parastronaut project	6
Selection process	7
How to apply	8
The European Space Agency: space for everyone	9
Benefits of spaceflight	10
ESA astronauts	11
Astronauts in space	12
Astronauts on Earth	13
Support team	14
Phases of training	15
Training locations	16
CAVES	17
Pangaea	18
ESA's human and robotic exploration destinations	19

International Space Station	20
Gateway	21
Orion European Service Module	22
Rockets	23
ESA Member States	24
Establishments and facilities	25
Infographics	26
Images	27
Videos	28
Websites	29
Contact	30

This document contains videos and links to web pages for more information. Click on the  and  icons to discover more information. Links to recommended images, videos and animations are provided towards the end of this information kit. An internet connection is required to access the webpages.

For the first time since 2008, ESA is seeking new astronauts to join a journey of discovery for the benefit of Earth.

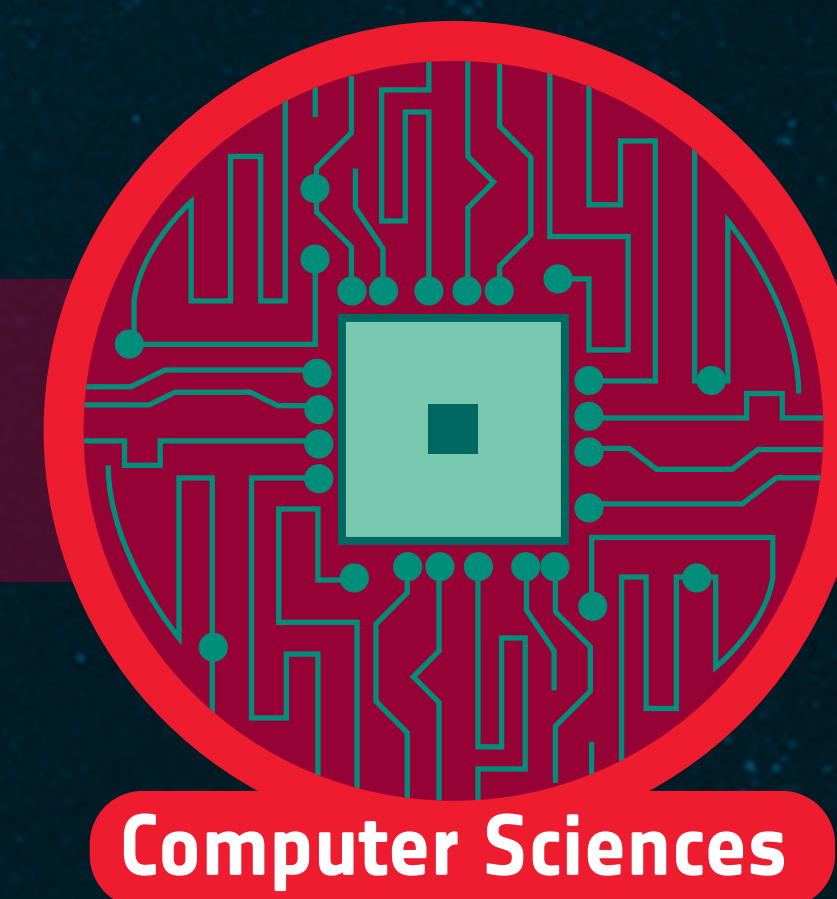
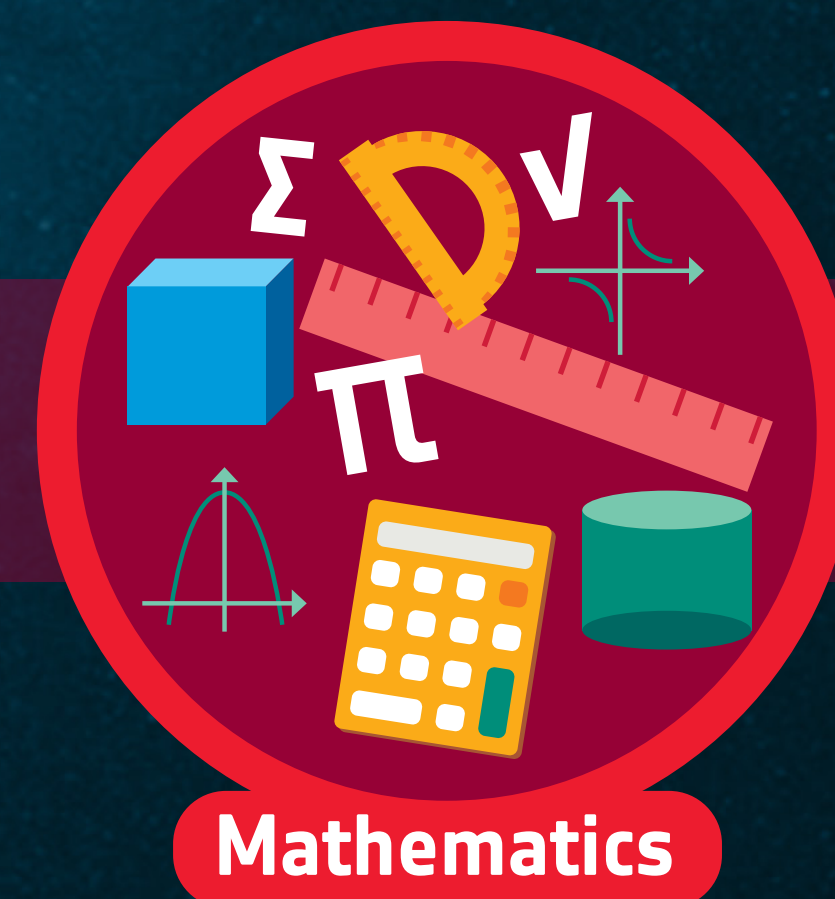
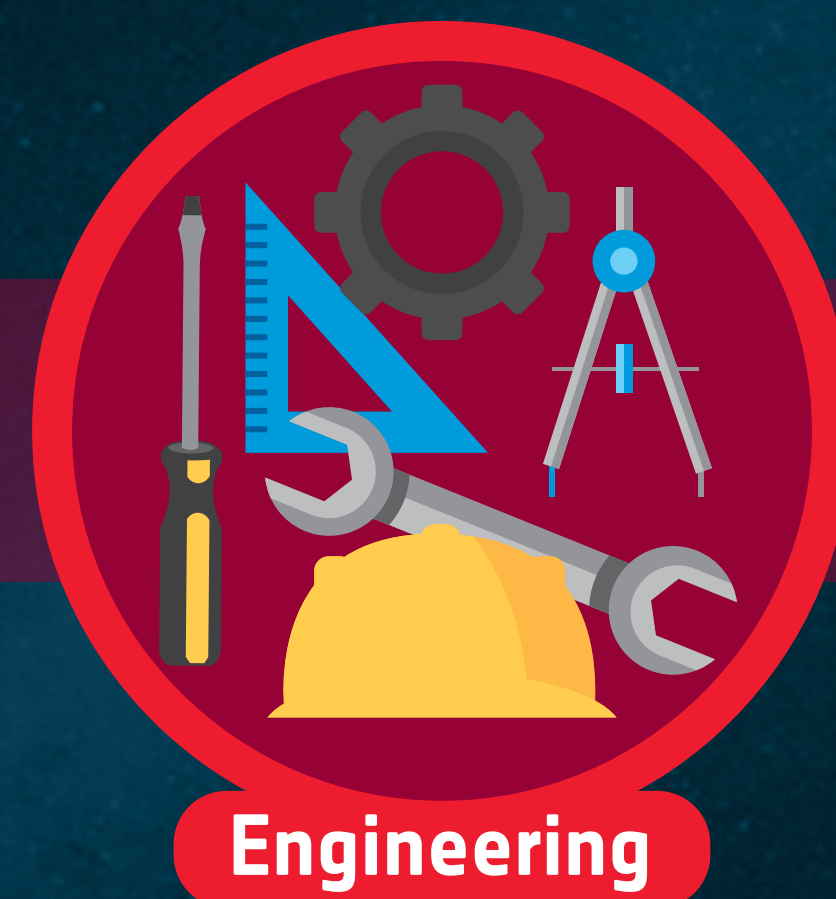
This collection of infographics gives a small insight into the role of an ESA astronaut, selection requirements, astronaut training, what ESA does and – most importantly – how you can apply!

Are you ready?
Read on for your way to space.

EUROPEAN SPACE AGENCY

WHO CAN APPLY?

There are many paths to becoming an astronaut...
ESA is seeking candidates with a Master's degree
(or higher) and a minimum of three years'
experience in:




Applications from all **qualified candidates**,
irrespective of gender, sexual orientation, ethnicity,
beliefs, age, or other characteristics, are welcome.

ESA is also issuing a **special call** for candidates
with physical disabilities to apply to its astronaut
reserve. Discover this new opportunity on the
ESA astronaut selection website.

REQUIREMENTS TO APPLY

**All aspiring astronauts must fulfil requirements described in the vacancy notice.
These include, but are not limited to:**

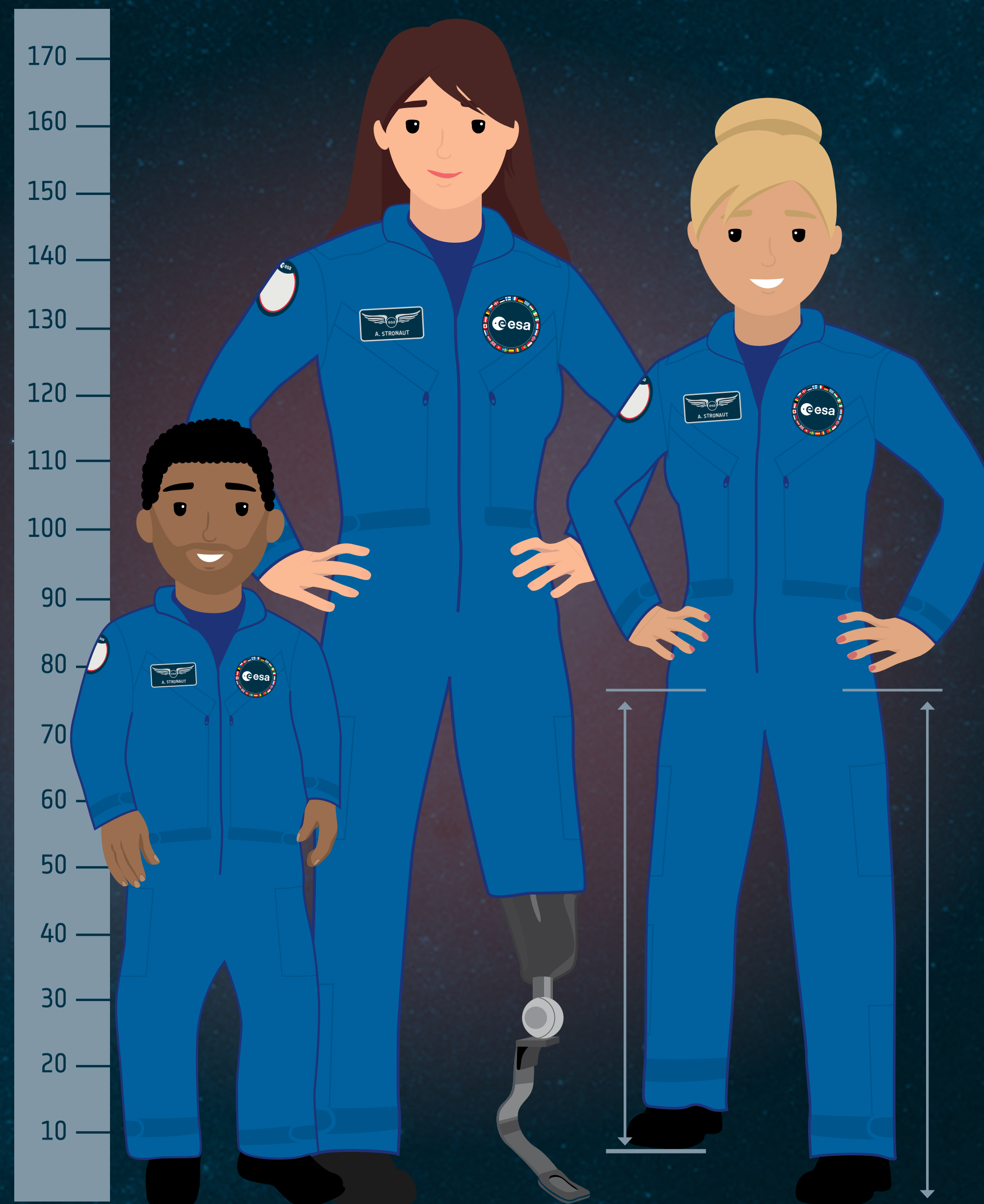
- 
- ☐ Citizen of an ESA Member or Associate Member State.
 - ☐ Master's degree (or higher) in: natural sciences (including physical sciences, Earth, atmosphere or ocean sciences, biological sciences, medicine), engineering, mathematics, computer sciences; or an experimental test pilot degree.
 - ☐ Three years' relevant professional post-graduate experience, showing progressive increase in responsibilities.
 - ☐ Fluent in English (minimum CEFR C1). Knowledge of additional languages (minimum CEFR B1-B2) is an asset.
 - ☐ Strong motivation and ability to cope with irregular working hours, frequent travel, and long absences from home, family and regular social life.
 - ☐ Flexible with regards to place of work (inside or outside Europe).
 - ☐ Calm under pressure.
 - ☐ Willing to participate in life science experiments.



PARASTRONAUT PROJECT

As part of ESA's commitment to enhance inclusiveness and fair representation, the Agency is launching the parastronaut feasibility project to assess the conditions for including **astronauts with disabilities** to work in space. This project is a new endeavour for Europe and a global first.

The feasibility project aims at offering **professional spaceflight opportunities** to a wider pool of talents. Starting with selected disabilities to have a thorough understanding of the potential challenges in terms of safety and operations in space, the scope of disabilities may then be extended aiming at broader inclusion.

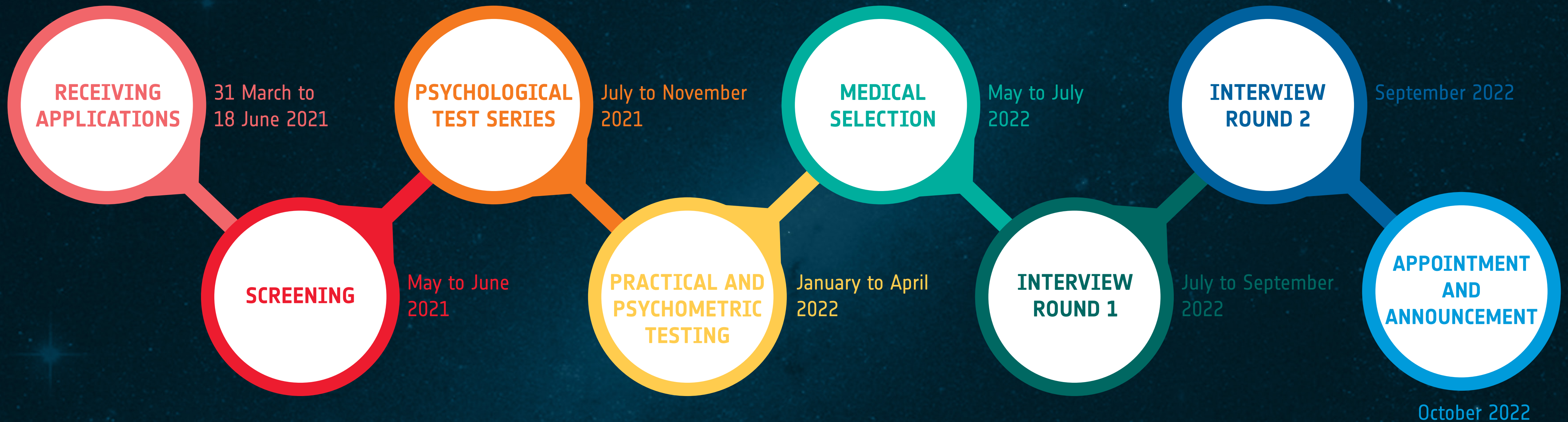


The selected candidate(s) will work with ESA to assess and optimise the conditions allowing people with physical disabilities to **work and live in space**.

The educational and psychological requirements for these candidates are the same as for the ESA astronaut selection. However, with respect to **physical requirements**, this feasibility project will allow the inclusion of candidates with the following disabilities:

- a lower limb deficiency, as follows:
 - Single or double foot deficiency through ankle
 - Single or double leg deficiency below the knee
- a pronounced leg length difference
- a short stature (<130 cm)

SELECTION PROCESS



The situation regarding COVID-19 may change this schedule.

HOW TO APPLY

- 1** Applications open 31 March 2021 and close 18 June 2021
- 2** Submit a complete application online through the **ESA careers website** before the vacancy closes
- 3** Create an account and answer an online questionnaire
- 4** Upload all documents specified in the vacancy notice:
 - a Europass CV (in English)
 - a motivation letter (in English)
 - a copy of your passport
 - a medical certificate issued by an aviation medical examiner showing you are medically certified for a Private Pilot Licence or higher. You do not need to actually hold a pilot licence.

Please take care when applying. All incomplete, late, or incorrectly submitted applications will be disregarded without exception.



THE EUROPEAN SPACE AGENCY: SPACE FOR EVERYONE

Established in 1975, ESA now has 22 Member States and cooperates with many others. These countries are home to more than 500 million European citizens. If you're one of them, then we're working for you.

Our mission is the peaceful exploration and use of space for the benefit of everyone. We watch over Earth, develop and launch inspiring and unique space projects, fly astronauts and push the boundaries of science and technology, seeking answers to the big questions about the Universe.

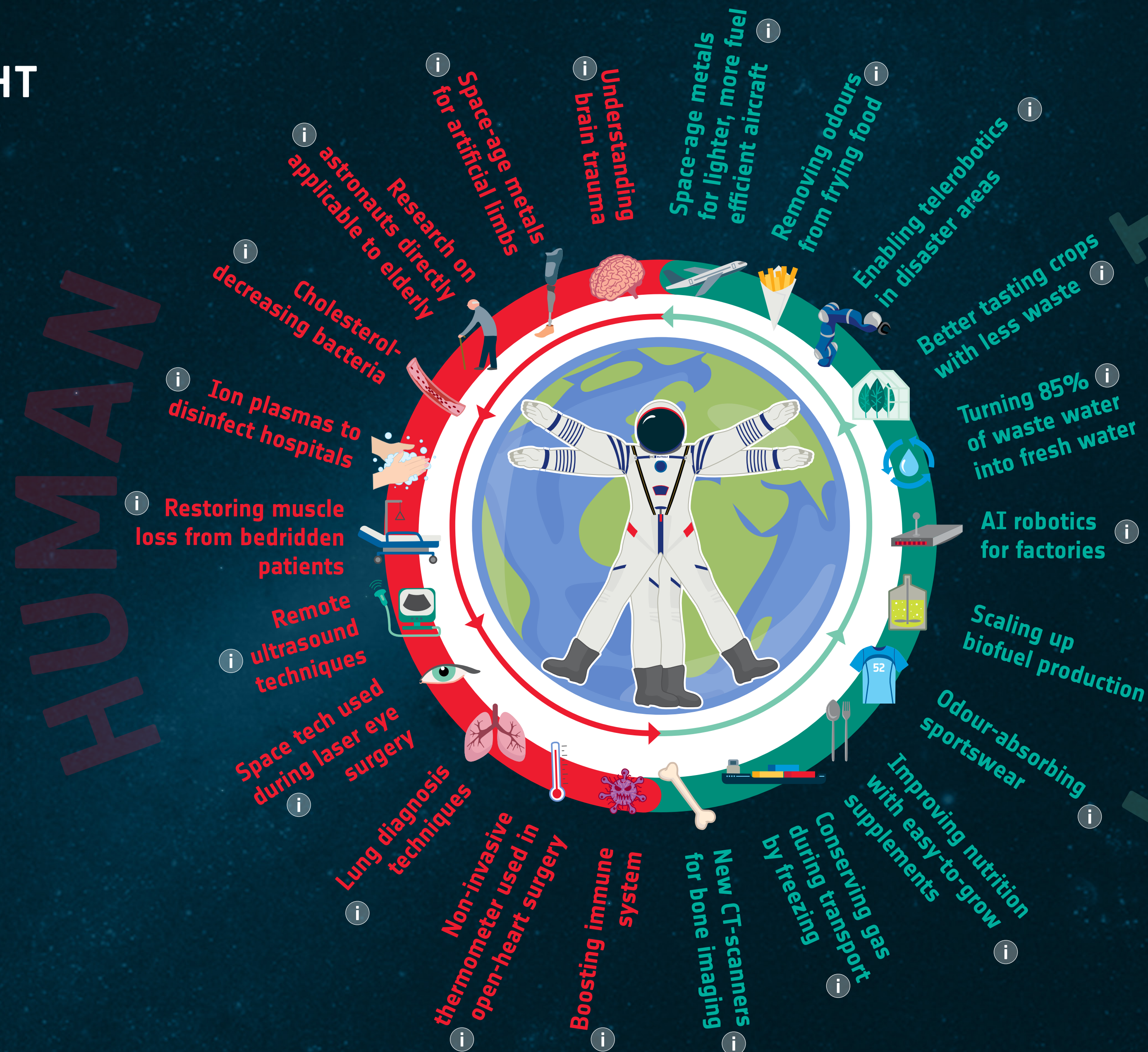
We are a family of scientists, engineers and business professionals from all over Europe, working together in a diverse and multinational environment.



BENEFITS OF SPACEFLIGHT

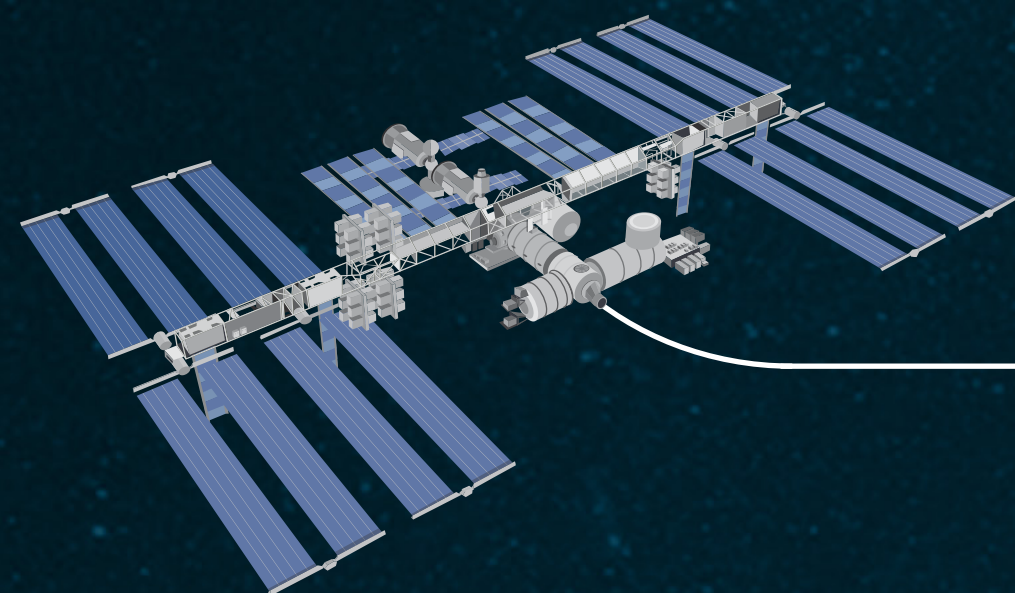
Human and robotic spaceflight contributes to a **circular economy**. Our research and technology developments improve energy efficiency, automation, robotics and artificial intelligence, as well as habitation, recycling, waste management and additive manufacturing processes and technology.

Click on the benefits to the right for more information about each subject and how it is helping people on Earth.



ESA ASTRONAUTS

European astronauts on the International Space Station



Umberto Guidoni



STS-100
April – May 2001

Claudie Haigneré



Andromède
October 2001

Roberto Vittori



Marco Polo
April – May 2002

Philippe Perrin



STS-111
June 2002

Frank De Winne



Odissea
October – November 2002

Frank De Winne



OasISS
May – December 2009

Léopold Eyharts



STS-122
February – March 2008

Hans Schlegel



STS-122
February 2008

Paolo Nespoli



Esperia
October – November 2007

Christer Fuglesang



Celsius
December 2006

Thomas Reiter



Astrolab
July – December 2006

Roberto Vittori



Eneide
April 2005

André Kuipers



DELTA
April 2004

Pedro Duque



Cervantes
October 2003

Christer Fuglesang



Alissé
August – September 2009

Paolo Nespoli



MagIStra
December 2010 – May 2011

Roberto Vittori



DAMA
May 2011

André Kuipers



PromISSe
December 2011 – July 2012

Luca Parmitano



Volare
May – November 2013

Alexander Gerst



Blue Dot
May – November 2014

Samantha Cristoforetti



Futura
November 2014 – June 2015

Andreas Mogensen



Iriss
September – October 2015

Tim Peake



Principia
December 2015 – June 2016

You?



Matthias Maurer



Cosmic Kiss
Autumn 2021

Thomas Pesquet



Alpha
April 2021

Luca Parmitano



Beyond
July 2019 – February 2020

Alexander Gerst



Horizons
June – December 2018

Paolo Nespoli



Vita
July – December 2017

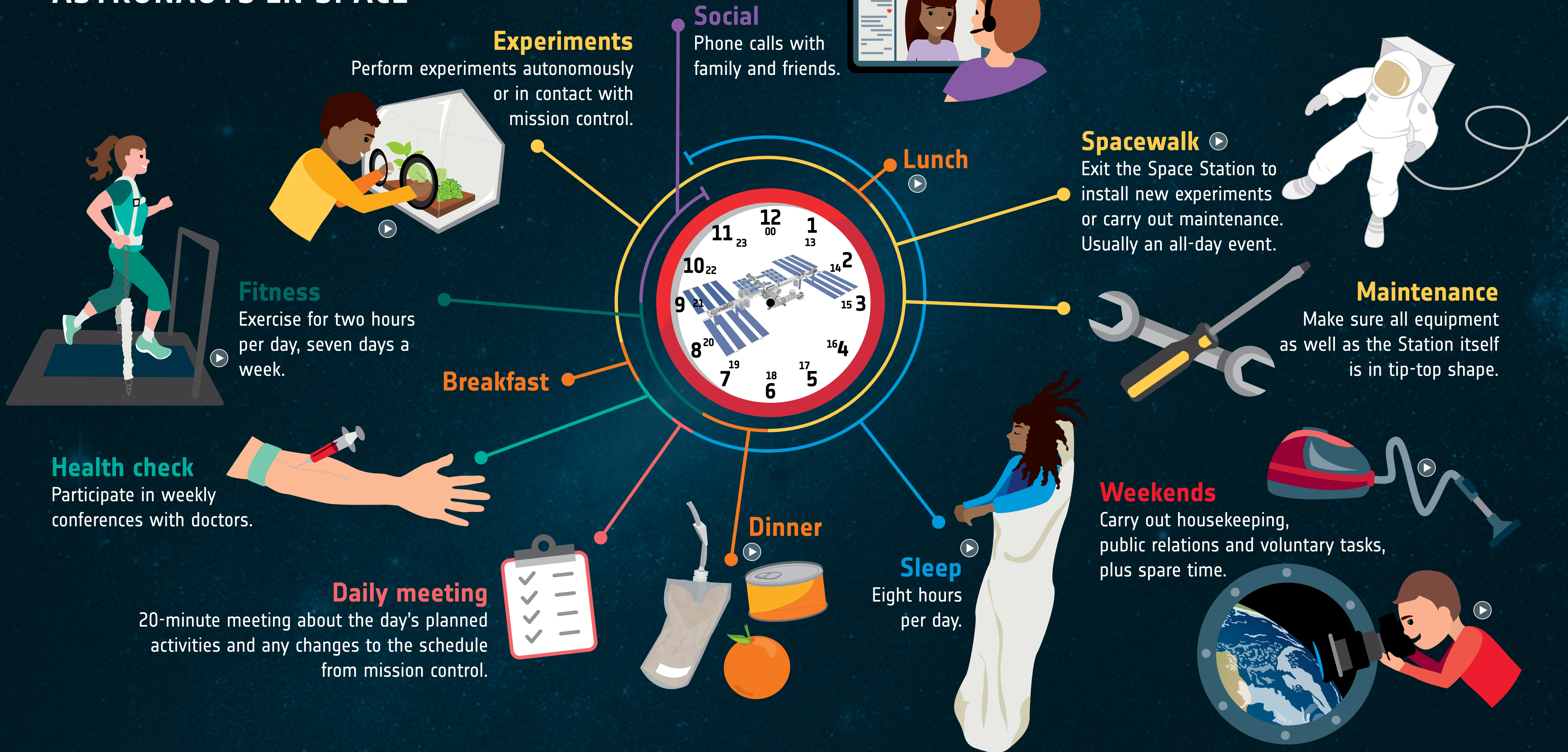
Thomas Pesquet



Proxima
November 2016 – May 2017



ASTRONAUTS IN SPACE

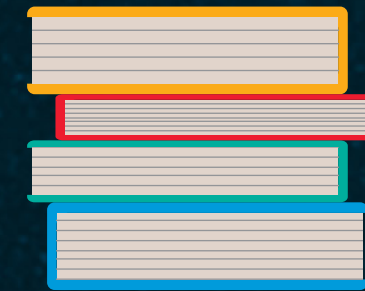


ASTRONAUTS ON EARTH

Tasks ESA astronauts perform when they are not in space.

Office work

Attend meetings and briefings, serve on boards, advise on procedures and protocols.

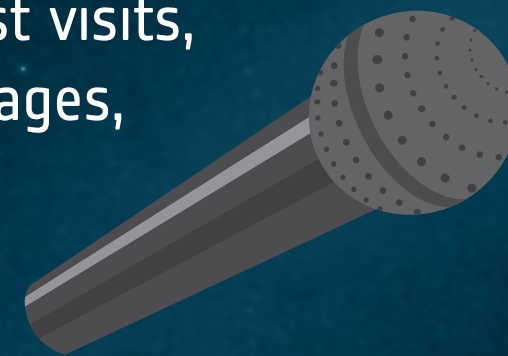


Training

Refresher sessions, language classes, medical training, mission-specific training.

Public relations and media

Give interviews, host visits, record special messages, social media.



Education and outreach

Attend special events, speak with young people about ESA and space topics.

Mission support

Lead team in charge of ESA astronaut operations and crew support.

Exercise

Maintain an adequate level of fitness through sport and exercise.



Travel

Travel for events, conferences, training and longer-term postings with partner agencies.



Mission control

Guide astronauts through spacewalks and spacecraft operations by radio from mission control.



Special assignments

Participate in analogue missions such as NASA's NEEMO and ESA's CAVES and Pangaea training.

SUPPORT TEAM

Space exploration is a team effort, requiring many functions. Here are a few other roles that help ensure mission success.

Eurocoms

Europe's specialist communicators and biomedical engineers are the voice link between astronauts in space and ground control teams on Earth.

Crew support

The wellbeing of astronauts and their families is supported by a dedicated crew operations team.

Medical experts

Flight surgeons, exercise specialists, administrators and other experts take care of an astronaut's health.

Scientists and researchers

Principal investigators and their teams develop and support the experiments astronauts perform in orbit.

Trainers

Astronaut trainers prepare crew members to carry out tasks and experiments in space.

Planners

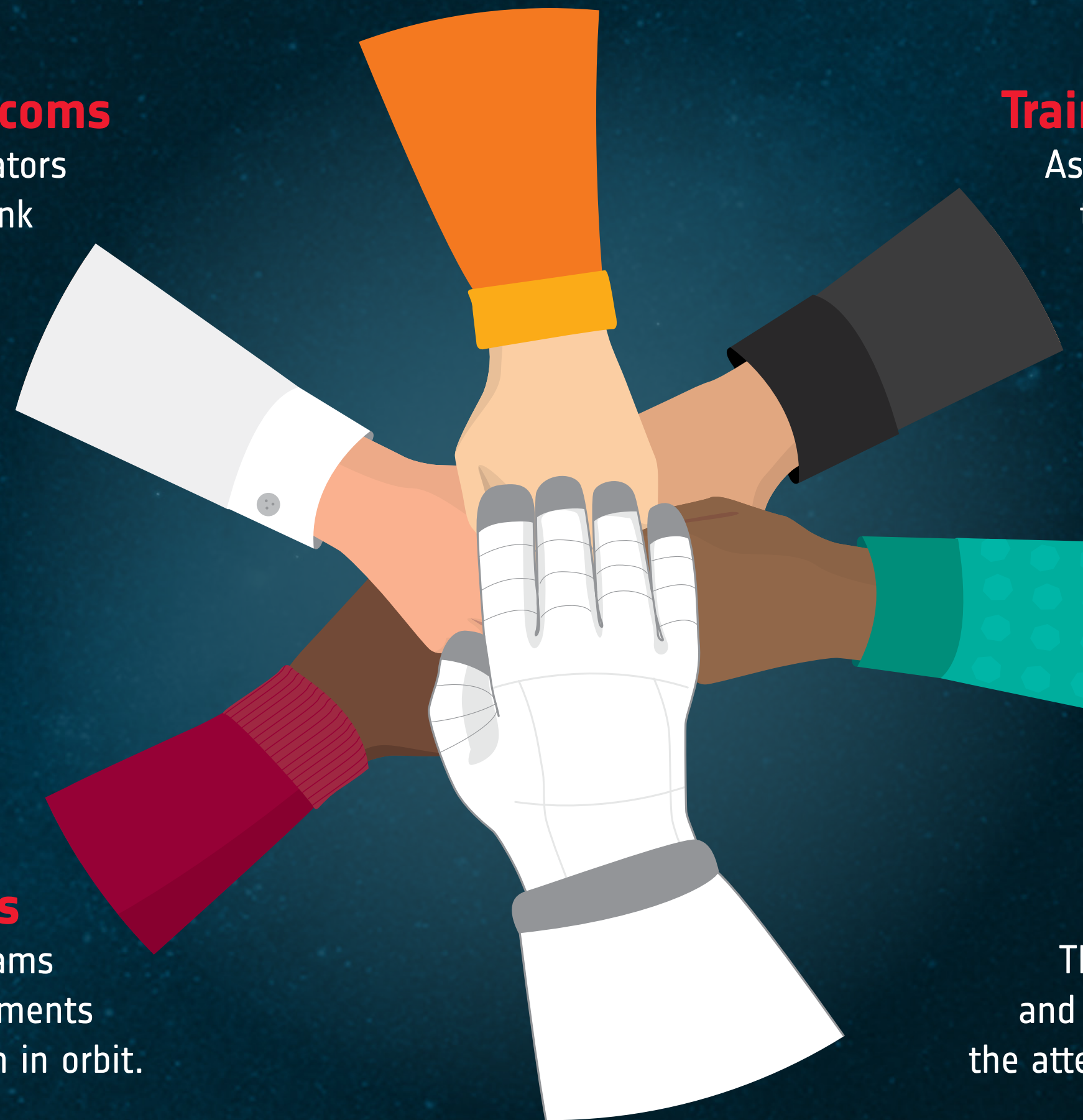
An astronaut's time is a precious resource, planners make sure this is scheduled for use in the most efficient way.

Flight directors

The team at ESA's Columbus Control Centre make sure astronauts work safely in Europe's space laboratory, and command and control systems from the ground.

Public relations, media and communications

This team brings the fascinating science and operations of astronaut missions to the attention of the public.



PHASES OF TRAINING

Astronaut training is constantly evolving. However, there are **three key phases** for European astronauts.

BASIC TRAINING

One year, at European Astronaut Centre

Introduction to:

- ESA
- International space programmes
- Engineering and science fundamentals
- Space systems and vehicles

- Basic astronaut skills
- Russian language
- Survival skills

PRE-ASSIGNMENT TRAINING

Length varies, at all partner sites

Gain in-depth knowledge:

- Resource and data operations, robotics
- Navigation
- Maintenance
- Spacewalks

- Medical practices and payloads
- At this stage astronauts also support operations for ongoing missions

INCREMENT TRAINING

Around two years, at multiple locations

Once assigned a spaceflight:

- Prepare for assigned mission
- Focus on specific tasks and experiments to be performed in space



TRAINING LOCATIONS

Canadian Space Agency
Robotics Training Centre
Montreal, Canada

NASA
Johnson Space Center
Houston, United States

SpaceX
Dragon training
Hawthorne, United States

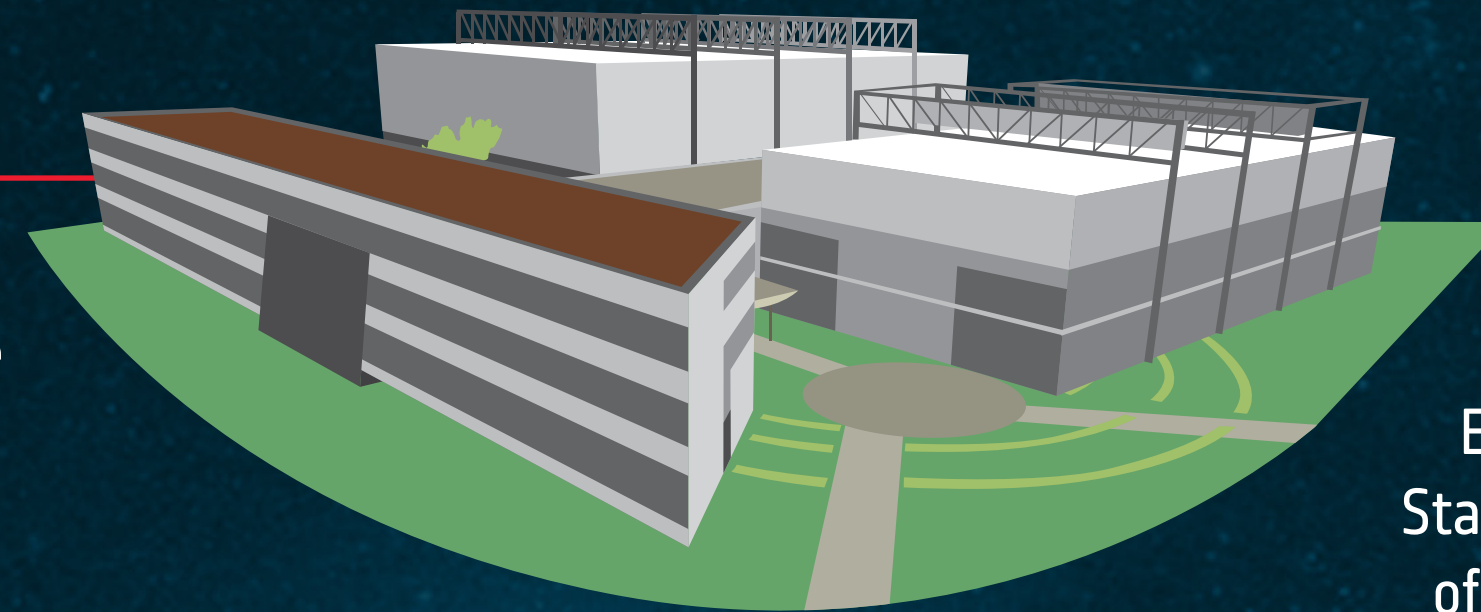
NASA
Kennedy Space Center
Florida, United States

ESA
European Astronaut Centre
Cologne, Germany

Roscosmos
Yuri Gagarin Cosmonaut Training Centre
Star City, Russia

Roscosmos
Baikonur Cosmodrome
Baikonur, Kazakhstan

JAXA
Tsukuba Space Center
Tsukuba Science City, Japan



European Astronaut Centre
Home to ESA's astronaut corps, it trains Europeans to fly to the International Space Station, while preparing for an exciting future of space exploration beyond low Earth orbit.

200+
People involved in astronaut training across the globe.



30+
Astronauts from all over the world train each year at ESA's astronaut centre.



CAVES

CAVES stands for Cooperative Adventure for Valuing and Exercising human behaviour and performance Skills. The three-week course prepares astronauts to work safely and effectively in **multicultural teams** in an environment where safety is critical – in caves.



The cave environment provides many space-relevant conditions, including **isolation** from the outside world, confinement, minimal privacy, technical challenges, as well as limited equipment and supplies for hygiene and comfort. Participants must adapt to living and working together in a unique environment to meet scientific and exploration objectives.

Constant attention to **safety rules**, procedures and equipment is critical to the successful completion of the mission.

PANGAEA

The Pangaea course provides European astronauts practical knowledge of **geology of Earth, Moon and Mars** to prepare them to work with planetary scientists and engineers in the next exploration missions.

Astronauts train to work together with robots, scientists and engineers on Earth, using the best field geology and planetary observation techniques.

The course is split into several parts over a year, in these locations:

Earth and lunar geology

Nördlinger Ries crater,
Germany

Geological field training and astrobiology

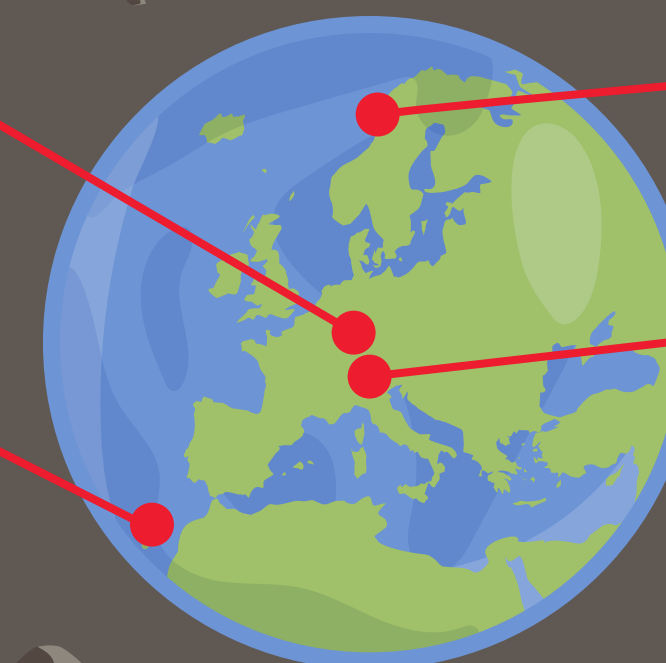
Lanzarote, Spain

Moon highland terrain

Lofoten, Norway

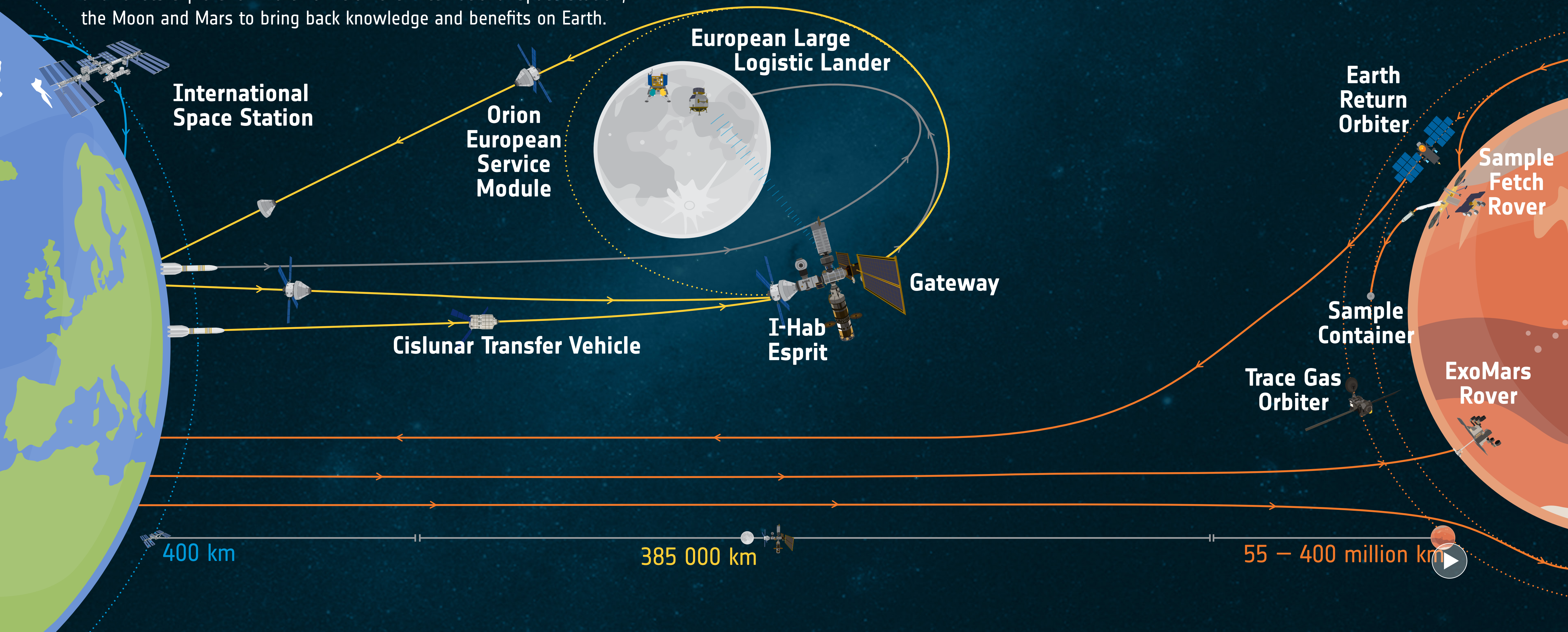
Martian sedimentary geology and surface processes

Bletterbach canyon, Italy



ESA'S HUMAN AND ROBOTIC EXPLORATION DESTINATIONS

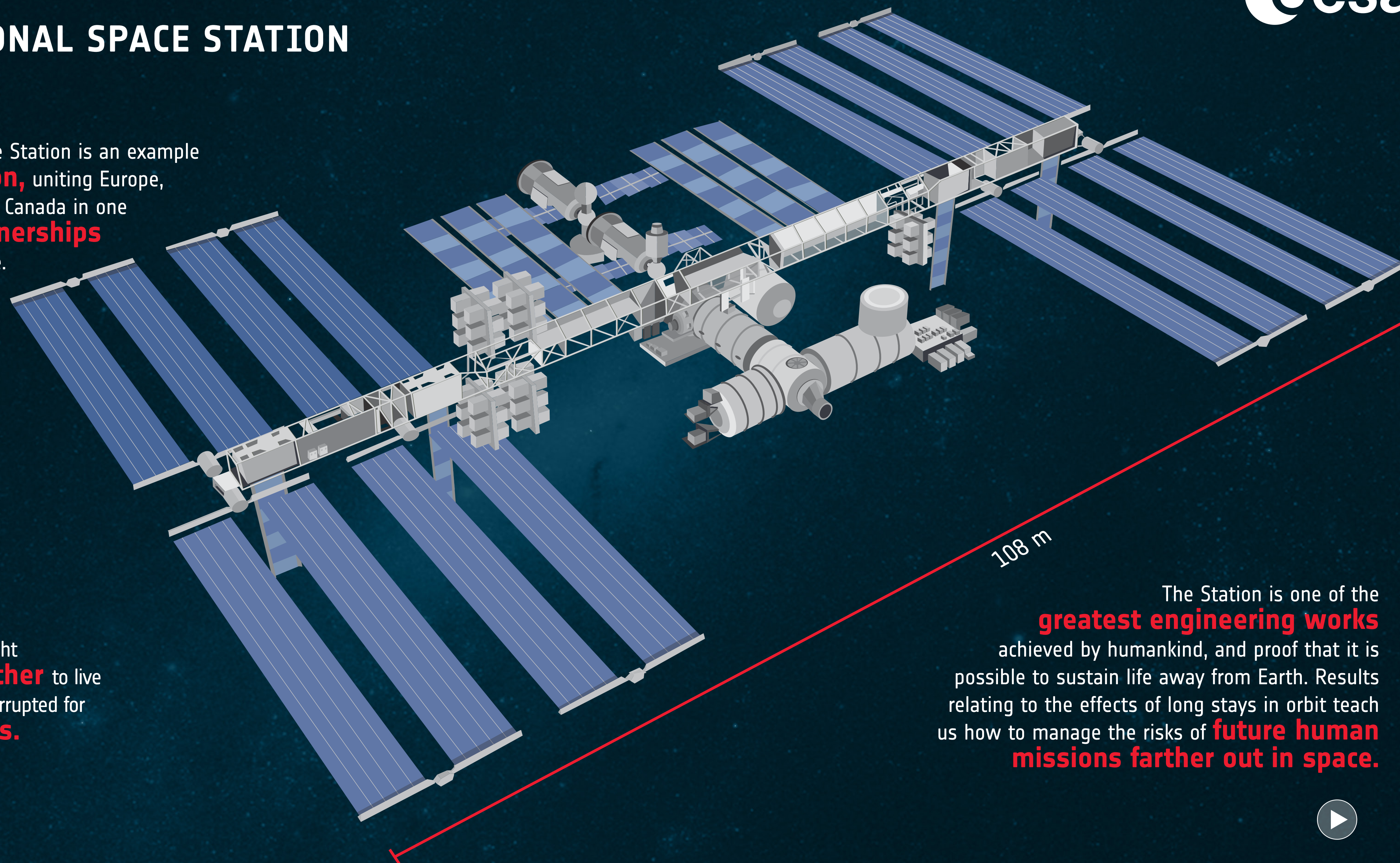
ESA's Human and Robotic Exploration programme will see astronauts and robots explore low Earth orbit on the International Space Station, the Moon and Mars to bring back knowledge and benefits on Earth.



INTERNATIONAL SPACE STATION

The International Space Station is an example of broad **cooperation**, uniting Europe, USA, Russia, Japan and Canada in one of the **largest partnerships** in the history of science.

The endeavour has brought **humankind together** to live and work in space uninterrupted for **over two decades**.



The Station is one of the **greatest engineering works** achieved by humankind, and proof that it is possible to sustain life away from Earth. Results relating to the effects of long stays in orbit teach us how to manage the risks of **future human missions farther out in space**.



GATEWAY

The lunar Gateway will be assembled and operated in a highly elliptical **orbit around the Moon.**

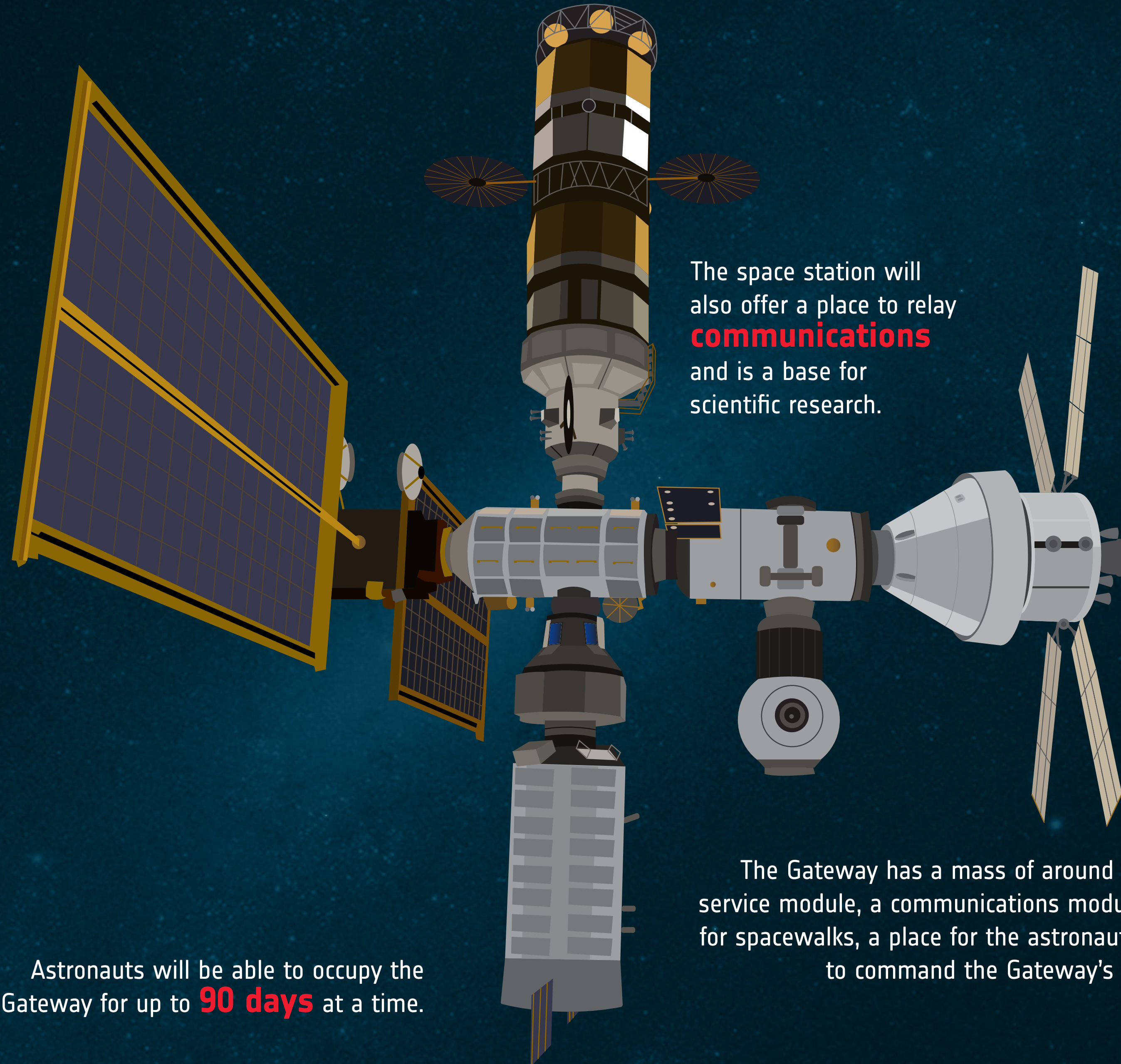
It will be a staging post for missions to the Moon and Mars. It will provide shelter and a place to stock up on supplies for astronauts en route to more **distant destinations.**

Astronauts will be able to occupy the Gateway for up to **90 days** at a time.

The space station will also offer a place to relay **communications** and is a base for scientific research.

Astronauts will use the **Orion spacecraft** to travel to the Gateway.

The Gateway has a mass of around **40 tonnes** and will consist of a service module, a communications module, a connecting module, an airlock for spacewalks, a place for the astronauts to live and an operations station to command the Gateway's robotic arm or rovers on the Moon.

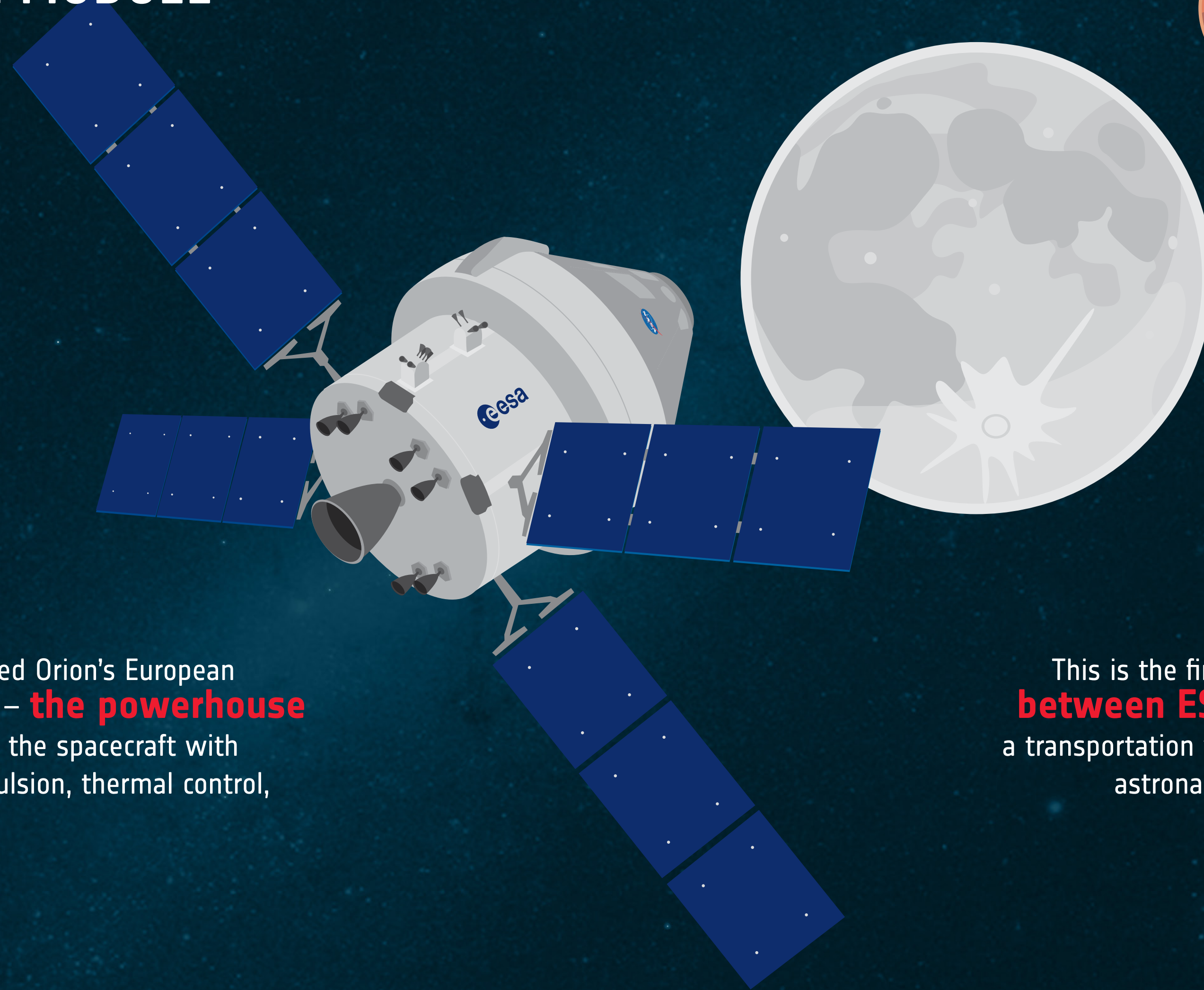


ORION EUROPEAN SERVICE MODULE

Orion is a NASA spacecraft set for missions to **the Moon, Mars and beyond.**

ESA has designed Orion's European Service Module – **the powerhouse** that will supply the spacecraft with electricity, propulsion, thermal control, air and water.

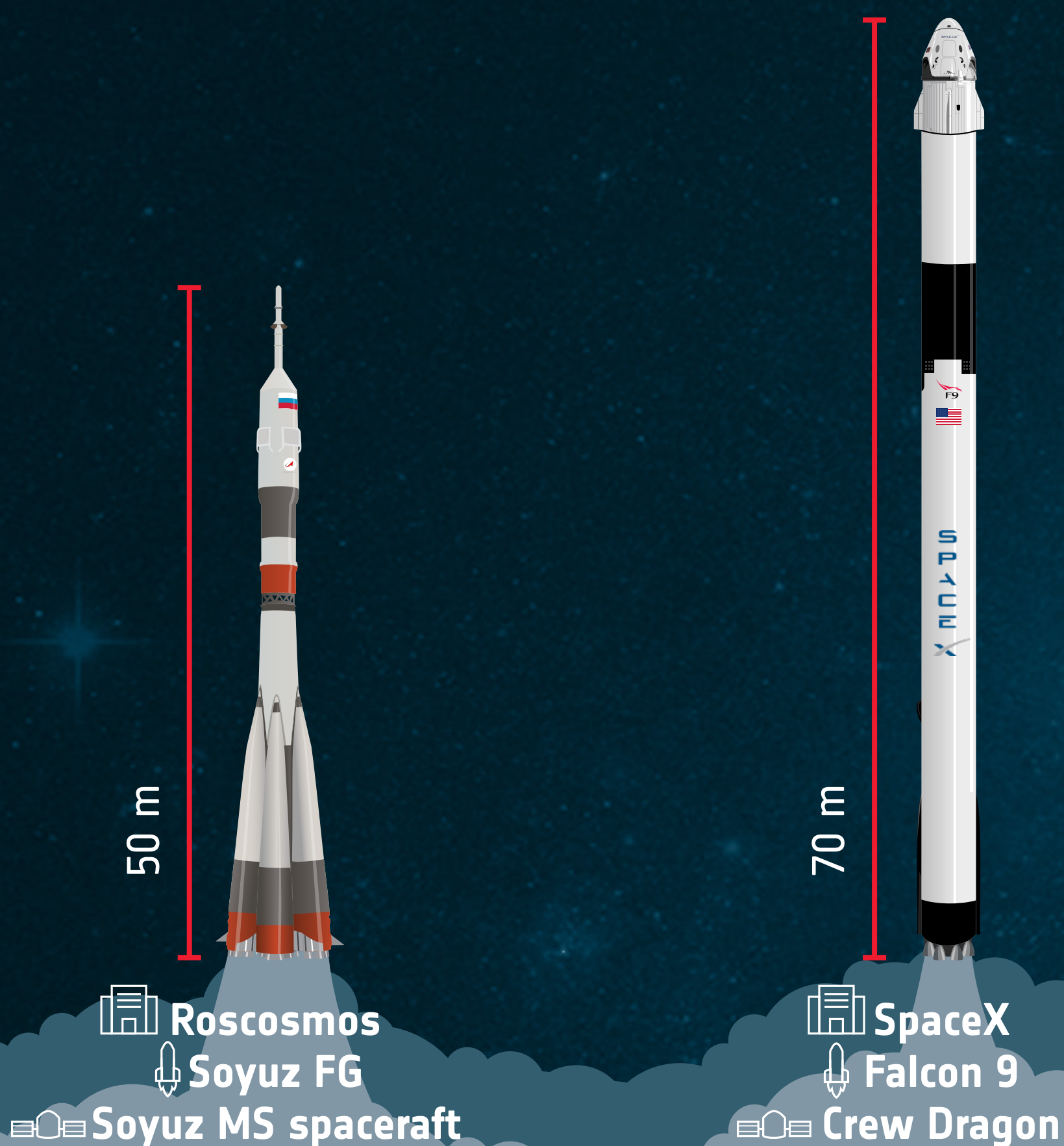
This is the first **collaboration between ESA and NASA** on a transportation vehicle that will carry astronauts farther into space than ever before.



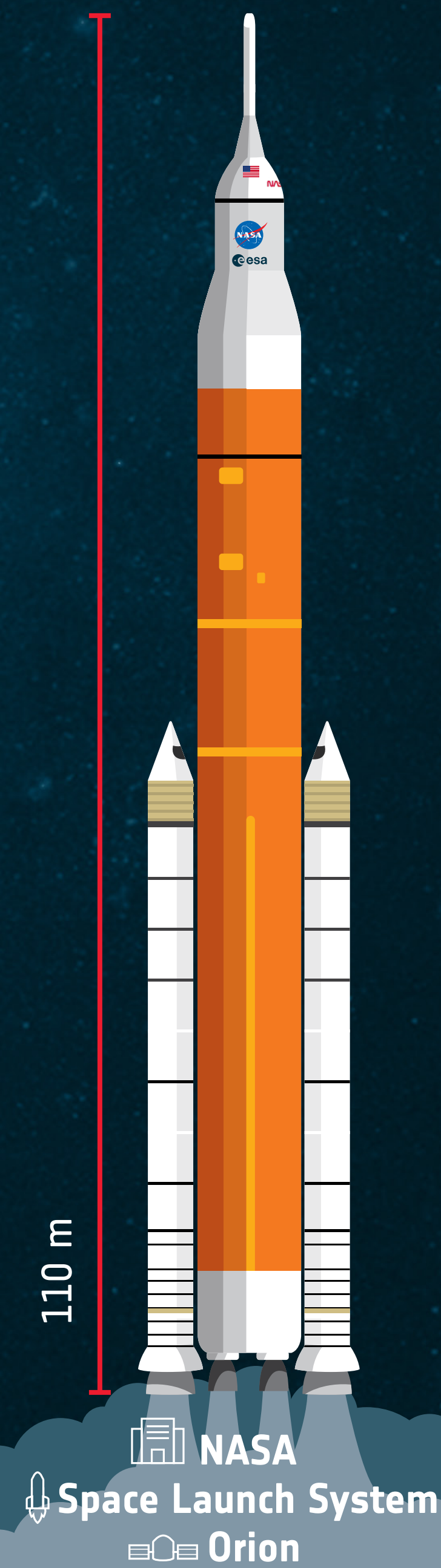
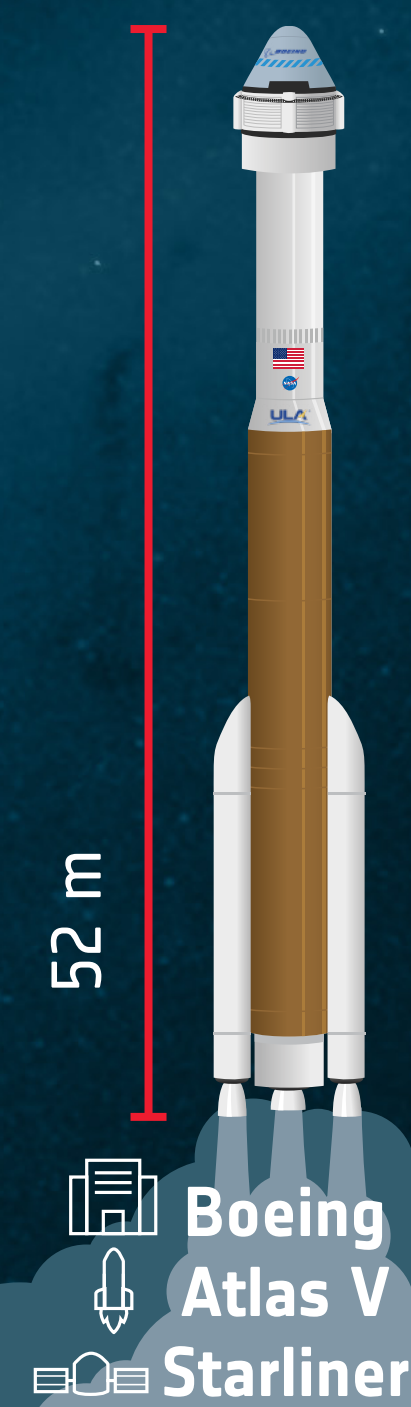
ROCKETS

Going to space

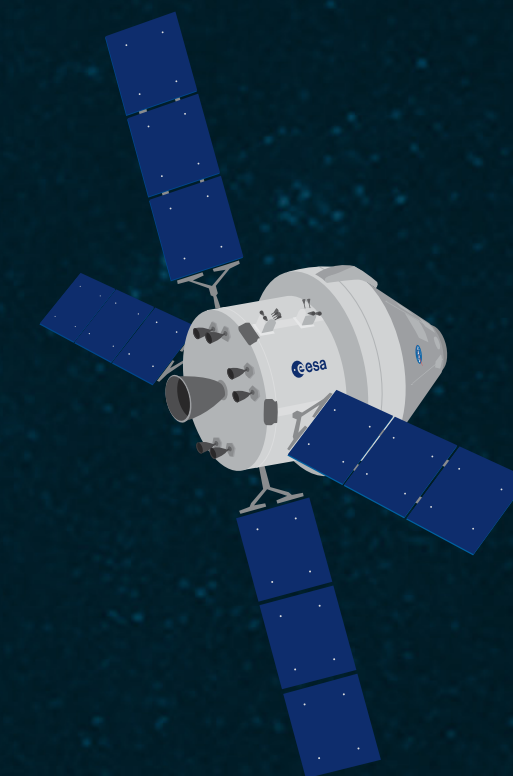
Getting to space requires a **rocket launch**. These are the rockets that ESA astronauts could be launched on.



The Russian Soyuz, commercial SpaceX Crew Dragon and Boeing Starliner fly to the **International Space Station**.



The Space Launch System rocket will launch the **Orion spacecraft** on Artemis missions to the Gateway and the Moon.



ESA MEMBER STATES

ESA is an **international organisation** with 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.



Member States

- | | |
|----------------|-----------------|
| Austria | Italy |
| Belgium | Luxembourg |
| Czech Republic | The Netherlands |
| Denmark | Norway |
| Estonia | Poland |
| Finland | Portugal |
| France | Romania |
| Germany | Spain |
| Greece | Sweden |
| Hungary | Switzerland |
| Ireland | United Kingdom |

Associate Members

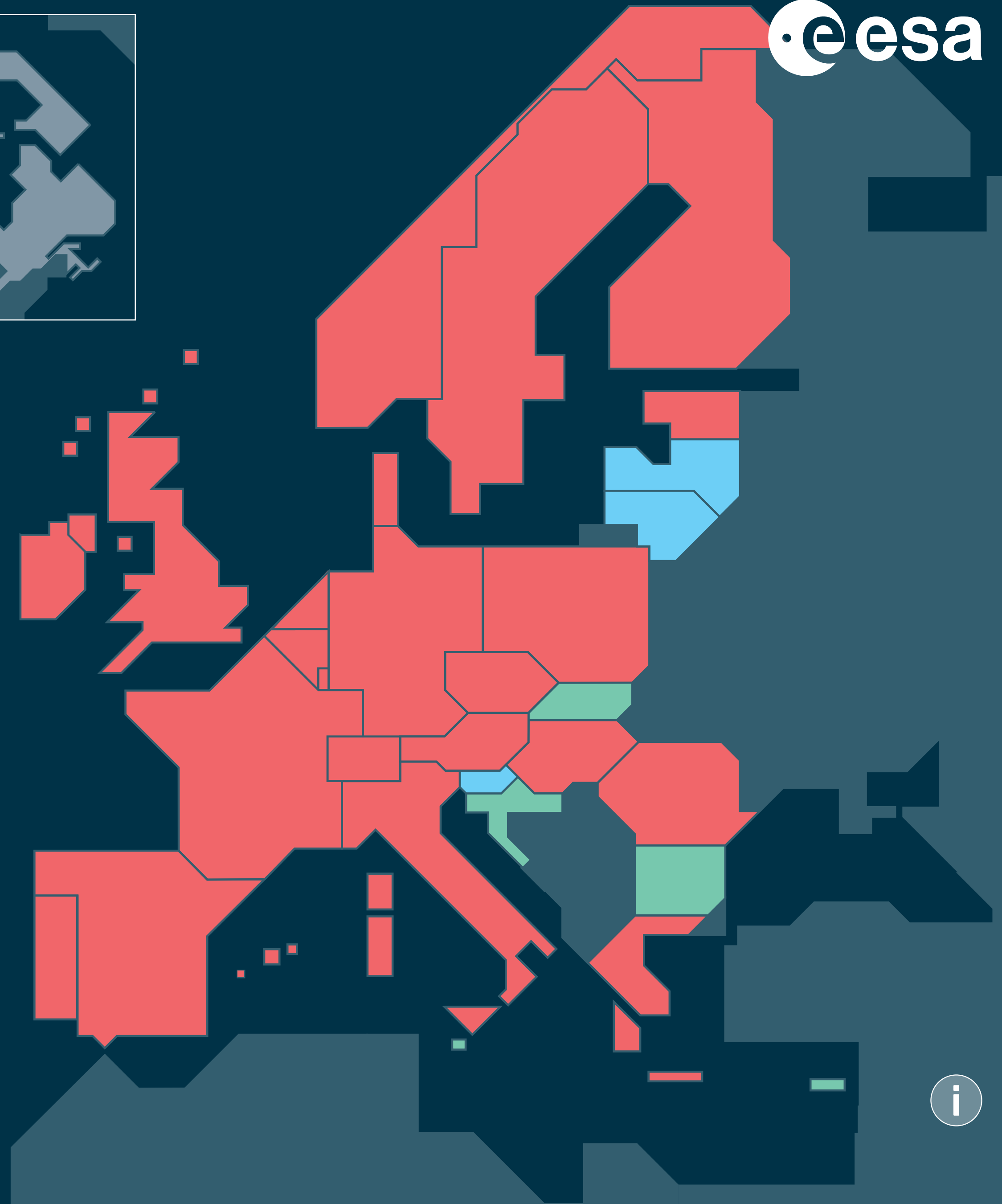
- Latvia
- Lithuania
- Slovenia

Long-standing Cooperating State

- Canada

Cooperating States in Europe

- Bulgaria
- Croatia
- Cyprus
- Malta
- Slovakia



ESTABLISHMENTS AND FACILITIES

ESA ESEC

Innovating in space security and education.

ESA HQ

Guiding Europe's activities in space.

ESA ESTEC

ESA's technical and research heart.

ESA EAC

Europe's hub of astronaut activity.

ESA ESOC

Where space missions come alive.

ESA ECSAT

Applying space to daily life.

EUROPE'S SPACEPORT

Guaranteeing European access to space.

ESA ESAC

ESA's window on the Universe.

ESA ESRIN

Keeping watch over our planet.

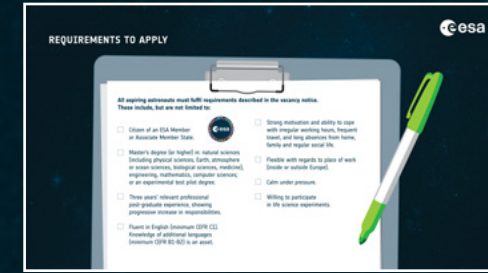
INFOGRAPHICS



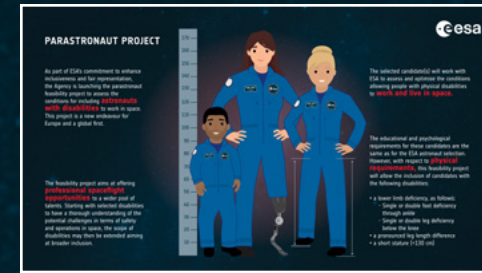
Your way to space



Who can apply?



Requirements to apply



Parastronaut project



Selection process



How to apply



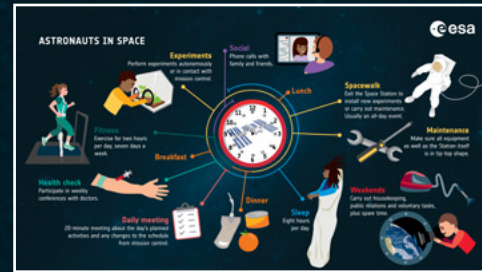
The European Space Agency: space for everyone



Benefits of spaceflight



ESA astronauts



Astronauts in space



Astronauts on Earth



Support team



Phases of training



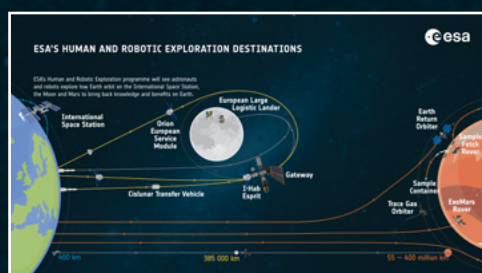
Training locations



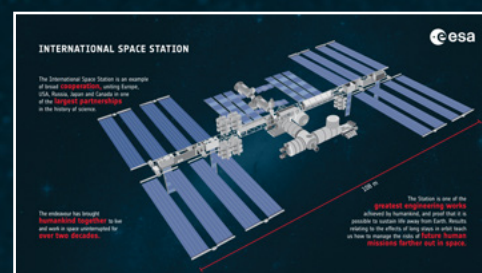
CAVES



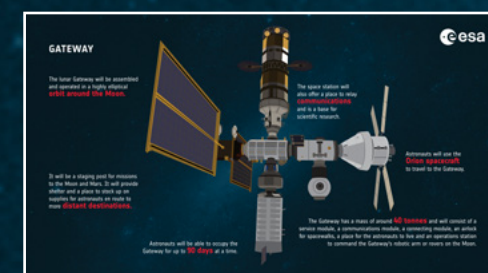
Pangaea



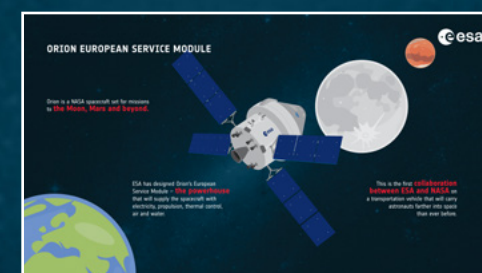
ESA's human and robotic exploration destinations



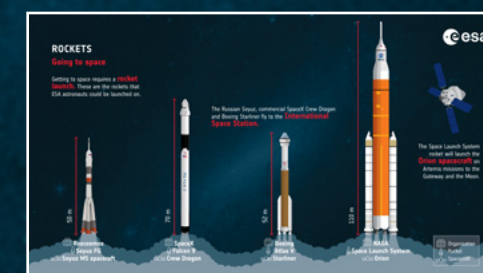
International Space Station



Gateway



Orion European Service Module



Rockets



ESA Member States



Establishments and facilities

IMAGES



Ten years of ESA's 2009 class of astronauts



Running experiments



Spacewalk



Orion



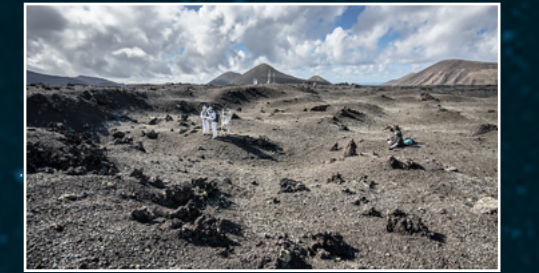
Gateway



Spacewalk training



CAVES course



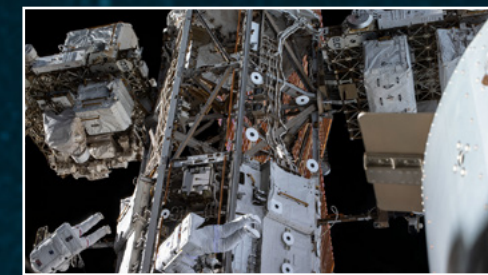
Pangaea course



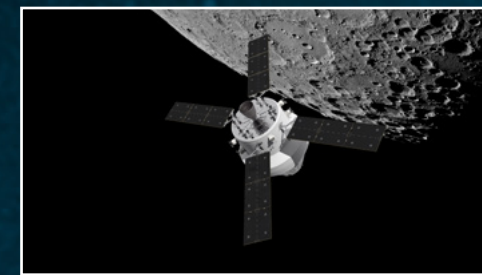
ESA astronauts, class of 2009



Science



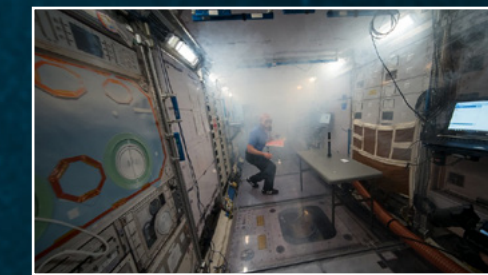
Spacewalk



Orion



Gateway



Training



CAVES course



Pangaea course



ESA astronauts, class of 2009



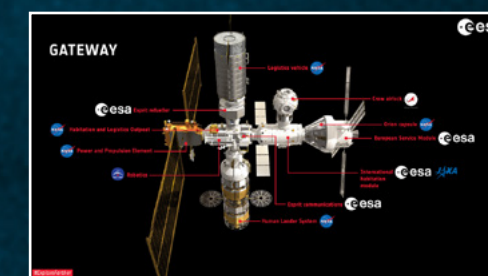
Science



Spacewalk



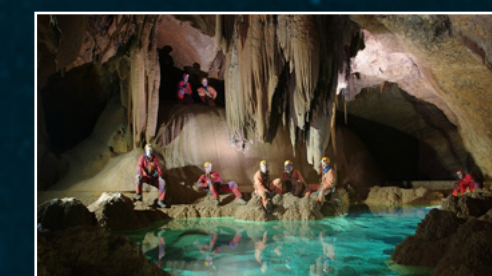
Orion European Service Module



Gateway concept



Training



CAVES course

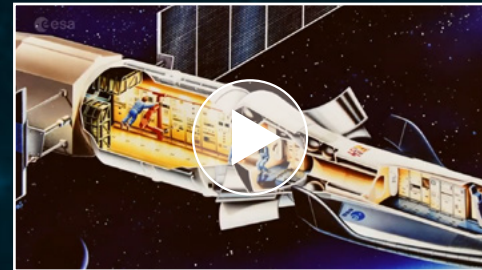


Pangaea course

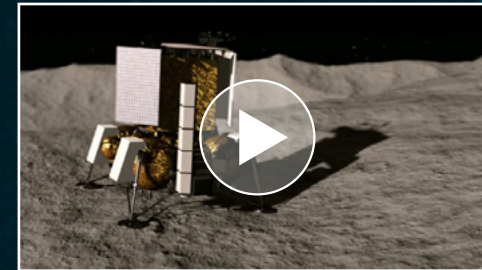
VIDEOS



International Space Station: 20 years in 60 seconds



A decade of European space science on Columbus



Human spaceflight and robotic exploration future



Visions of human spaceflight and robotic exploration



Alpha mission training — Thomas Pesquet



Blue Dot mission summary — Alexander Gerst



Tour of the Columbus laboratory with Tim Peake



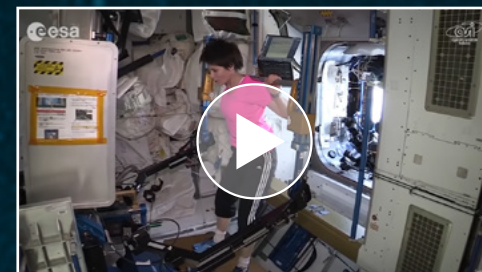
Destination: low Earth orbit



New eyes — Thomas Pesquet



Wall of the world — Alexander Gerst



Space medicine: staying fit in space



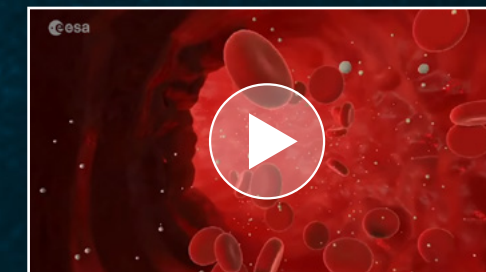
Space medicine: staying healthy in space



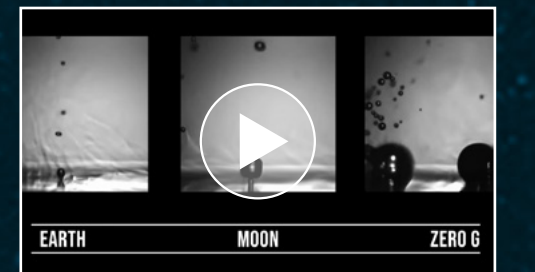
Science: Foams



Science: fluid mixtures



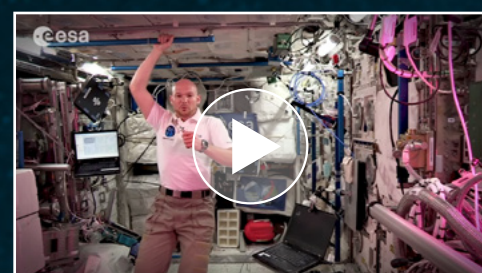
Science: growing blood vessels



Science: boiling



Space Station science with Samantha Cristoforetti



Three months of science in space with Alexander Gerst



Dizziness experiment with Tim Peake



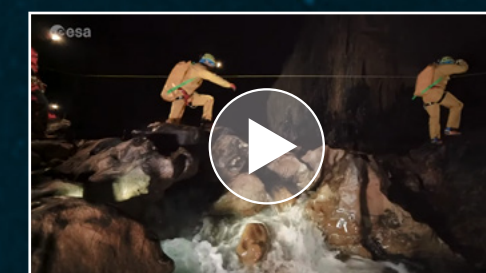
Sloshing liquids with Thomas Pesquet



Gyroscopes in space with Tim Peake



Training for a spacewalk with Matthias Maurer

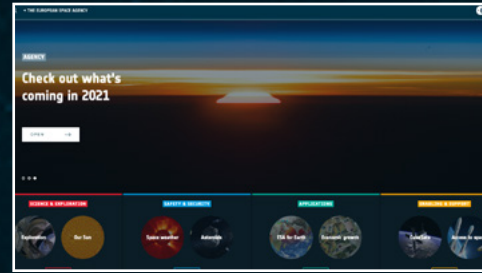


CAVES 2019

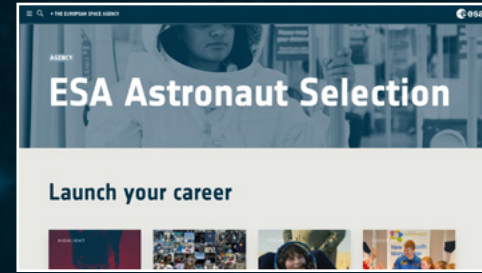


Pangaea-X

WEBSITES



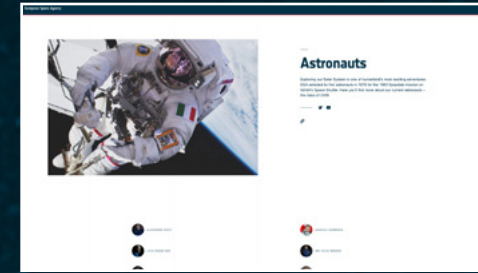
ESA



ESA astronaut selection



Careers at ESA



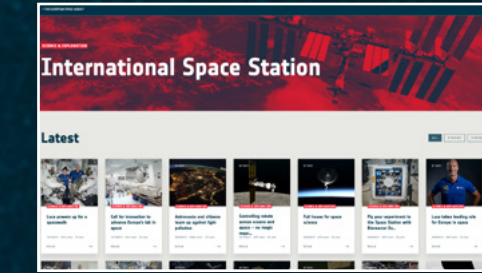
ESA astronauts



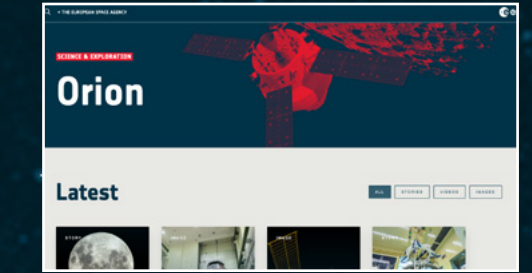
The European astronaut corps



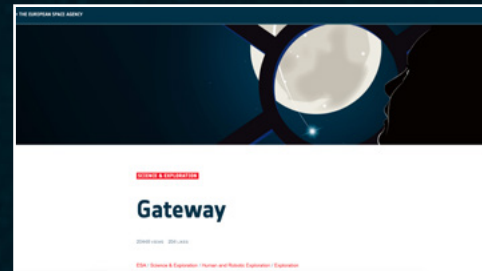
European Astronaut Centre



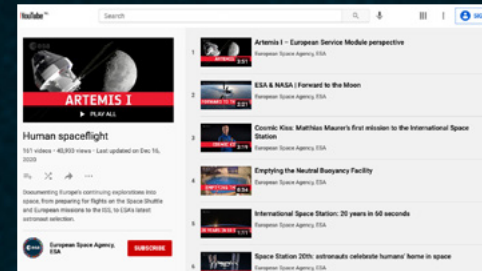
International Space Station



Orion



Gateway



Human and robotic exploration



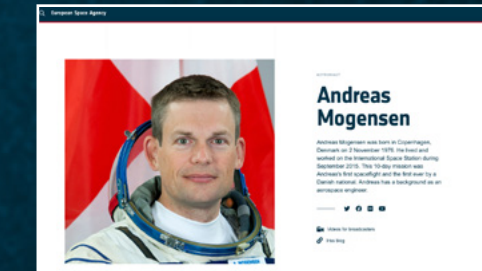
Luca Parmitano



Alexander Gerst



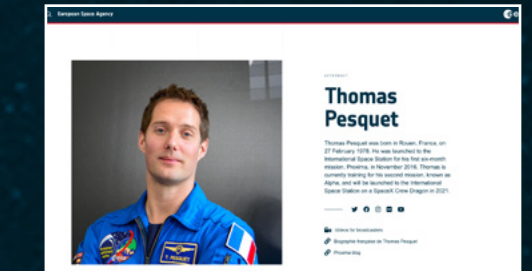
Samantha Cristoforetti



Andreas Mogensen



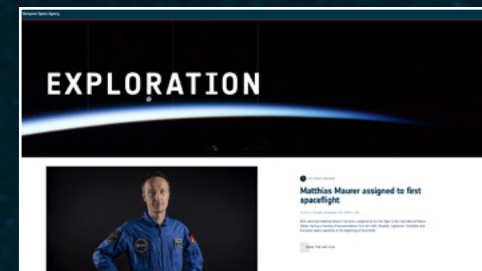
Tim Peake



Thomas Pesquet



Matthias Maurer



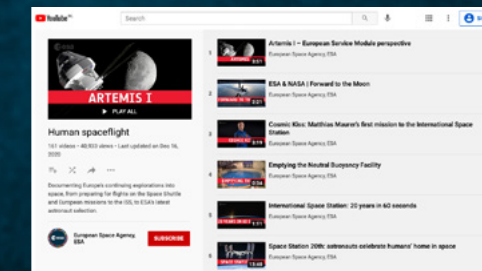
ESA exploration blog



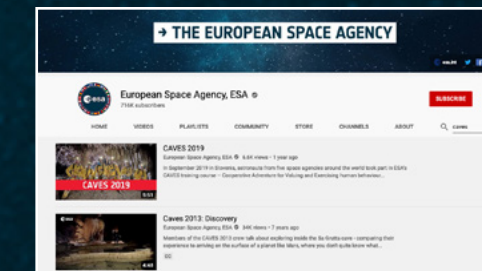
CAVES and Pangaea blog



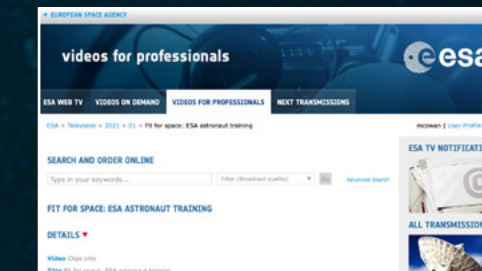
Lunar web documentary



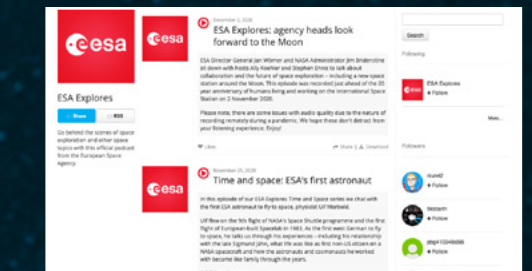
Human and Robotic Exploration on YouTube



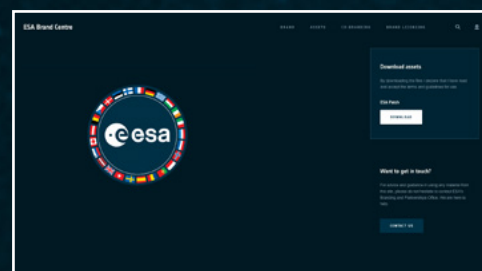
CAVES videos



ESA videos for professionals: Fit for space



ESA Explores podcast



ESA Brand Centre — ESA Patch

CONTACT

Ninja Menning

Head of Newsroom and Media Relations

media@esa.int

ESA ESTEC, Netherlands

 www.esa.int/YourWayToSpace

 facebook.com/EuropeanSpaceAgency

Jules Grandsire

Corporate Communication Manager

Jules.Grandsire@esa.int

ESA Headquarters, Paris, France

 instagram.com/EuropeanSpaceAgency

 youtube.com/EuropeanSpaceAgency

Marco Trovatello

Communication Programme Officer

Marco.Trovatello@esa.int

ESA EAC, Cologne, Germany


 flickr.com/EuropeanSpaceAgency

Rosita Suenson

Communication Programme Officer

Rosita.Suenson@esa.int

ESA ESTEC, Noordwijk, The Netherlands

 linkedin.com/company/european-space-agency/

 twitter.com/esa
twitter.com/esaspaceflight

Official hashtag: **#YourWayToSpace**



An ESA Production
Copyright © 2021 European Space Agency

