ASTRONAUT APPLICANT HANDBOOK

What you need to know to apply

Applications accepted until 28 May 2021 on jobs.esa.int

#YourWayToSpace
What you need to know to apply

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WE ARE
THE EUROPEAN SPACE AGENCY

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ASTRONAUT TRAINING
In 1977, ESA took its initial steps into human spaceflight by organising its first astronaut selection. This event marked the beginning of more than four decades of successes, with missions ranging from the first flight of Spacelab in 1983 to the age of long-duration spaceflight on board the International Space Station. In November 2019, ESA’s Space 19+ Ministerial Council discussed the ambitions of Europe in space, and confirmed its commitment to space exploration. This includes continued astronaut flights to the International Space Station, the first European astronaut flights beyond low Earth orbit to the lunar Gateway and continued robotic exploration of Mars. Other long-term goals include landing a European astronaut on the lunar surface by 2030 and the European participation in a human mission to Mars.

Astronauts are highly skilled personnel who train for a variety of space missions. Representing all of humankind, these space travellers test the limits of the human body in space, perform research, support the development of new technologies and explore the wonders of the Universe in one of the most extreme environments known.
ESA has issued three calls for astronauts since 1978, with the most recent selection taking place in 2008-09. Now, in an exciting and rare opportunity, ESA plans to recruit an estimated four new astronauts in 2021-22, to take part in its future activities in space.

With its 22 Member States, ESA is a truly international space agency that benefits every day from the great wealth and diversity of the cultures they represent.

Any citizen from one of ESA’s Member States (Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, the United Kingdom) and Associate Members (Slovenia and Latvia) can apply for the ESA astronaut vacancies.

At ESA, we want to go beyond the debate about the benefits of diversity and inclusiveness. For the first time in history, we are launching a call for qualified professionals living with a physical disability, included in the list of eligible disabilities, to apply to become an astronaut. The successful candidate(s) will join the astronaut reserve and participate in the Parastronaut Fly! Feasibility Project – an initiative investigating the feasibility of sending an astronaut with a physical disability into space.
We are the European Space Agency.

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, train astronauts and push the boundaries of science and technology, seeking answers to the big science 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. We are dedicated to a united space in Europe and united Europe in space.
Duties and responsibilities are the same for all astronauts. All astronauts are highly skilled professionals who must be able to apply their knowledge and expertise in situations of high stress and pressure. They are often away from their families and normal social life for extended periods. They take on high levels of responsibility while in space and have a strong determination to succeed.

Astronauts receive unique and continual training to fulfil their duties efficiently. As the most visible face of European human spaceflight, ESA astronauts are also natural ambassadors for ESA and its programmes. In this role, they participate in space-related activities and events, are also very active on media and social media channels, and make frequent public appearances.

Human exploration in low Earth orbit and beyond is an international cooperative endeavour. Astronauts live and work together with colleagues from international partner space agencies, especially the USA, Russia, Canada and Japan. They will train and work at these partner agencies and form an international team with a single chain of command during their missions, adhering to multilaterally agreed legal frameworks, policies and rules, including an astronaut code of conduct.

For more information on the duties and responsibilities of the ESA astronauts, please read both vacancy notices, for Astronaut and Astronaut (with a physical disability).
ESA astronauts are based primarily at the European Astronaut Centre (EAC) in Cologne, Germany, but may also be posted in other locations around the world. The EAC is a centre of excellence at the forefront of astronaut training, medical support and operations.

The European Astronaut Centre offers support to astronauts and their families during preparation for, and throughout their missions, and rehabilitation after a mission.

Astronauts spend most of their time preparing for their next mission. There are three main phases of training.

**Basic training**: following the selection process, basic training starts. This lasts one year at the EAC where astronauts will acquire the experience necessary for assignment to a space mission. This first phase covers the fundamentals of a wide range of engineering and science disciplines, lessons in Russian, training for a private pilot's licence, spaceflight training, survival techniques and lessons in space systems and orbital mechanics.

**Pre-assignment training**: this second phase can vary in duration and location and also includes astronauts from partner space agencies. This advanced training focuses on the specifics of the International Space Station, gaining the knowledge and in-depth skills to operate, service and maintain the Station’s modules, systems, payloads and transport vehicles. After basic training and during pre-assignment training, astronauts will be requested to perform duties within the Directorate of Human and Robotic Exploration, e.g. supporting other astronauts during their missions by conducting ground control operations.

**Increment training**: the third phase starts once an astronaut is assigned to a mission. This training is oriented towards the mission’s particular needs and characteristics. During assigned mission training (about 1.5 years), the skills and knowledge from previous training are applied to the experiment programme. The astronaut learns to operate the research equipment and the scientific background to the experiment. Depending on the mission, intensive training for the crew transport vehicle and emergency procedures may also be conducted.

The training for an astronaut is a **continuous journey with broad scientific, physical and academic training at space facilities** all around the world.
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APPLICATION AND SELECTION PROCESS

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Applications for the two vacancy notices, Astronaut and Astronaut (with a physical disability), are accepted from 31 March 2021 until 28 May 2021.

Only applications made online through the jobs.esa.int and submitted before the deadline of 28 May 2021 can be considered.

Please include all relevant information in a concise and structured manner in your CV, to facilitate the evaluation of your application.

In addition to completing the application form and attaching the required documents, you will need to answer an online questionnaire. This will play a major role in the first stage of the selection process, dealing with the requirements and asset criteria listed in the vacancy notices and this handbook.

The following document provides you with detailed information on the medical standards for private pilots.

At the time of application, it is not necessary to upload your academic qualifications and degrees; nor is it necessary to provide references. They will be checked and verified at a later stage in the selection process. Should you make it to that stage in the selection process, you will be asked to produce the necessary documentation and information.
To apply, you will need to create an account and upload the documents specified in the vacancy notice:

**ASTRONAUT APPLICANT HANDBOOK**

**APPLICATION AND SELECTION PROCESS**

**VACANCY: ASTRONAUT**

- Create an account
- Fill in the online questionnaire
- Documents to upload:
  - Europass CV
  - Motivation letter
  - Copy of passport
  - **European Part-MED, Class 2 (Private Pilot) medical certificate issued by an aviation medical practitioner**

**VACANCY: ASTRONAUT (WITH A PHYSICAL DISABILITY)**

- Create an account
- Fill in the online questionnaire
- Documents to upload:
  - Europass CV
  - Motivation letter
  - Copy of passport
  - **Standard medical certificate** from your General Practitioner or family doctor stating that if not for your disability, you would fulfil the criteria for an European Part-MED, Class 2 (Private Pilot) medical certificate.
  - **Medical file with details of the disability**
    (Every applicant will receive an email to upload the file via a dedicated link. The medical documents will be reviewed by the ESA Medical Board to determine eligibility).
There will be six selection stages and the whole process will last from the closure of the vacancies on 28 May 2021 to the announcement of the selected astronauts in autumn 2022.

The selection process for both vacancies is the same. The only difference, for astronauts with a physical disability, is a medical screening at stage 1 and a dedicated medical review of the disability during stage 4.

The astronaut selection procedure will be subject to certain confidentiality requirements in order to safeguard the proprietary and sensitive nature of the test and assessment procedure, the rights of privacy of the candidates and information that is not intended for public disclosure.
Several rounds of screening will be conducted on the basis of documents submitted, the application form and the screening questionnaire.

In addition, applications for the vacancy ‘Astronaut (with a physical disability)’ will undergo a medical screening.

Test Phase 2 is an assessment centre consisting of additional psychometric tests, individual and group exercises and practical tests.

Interview Round 1 is a panel interview that will test your technical and behavioural competencies. At this stage, your educational qualifications will be verified and a criminal record check conducted.

Test Phase 3 is a medical selection that will assess your physical and psychological condition in view of long-duration astronaut missions.

Applicants to the vacancy ‘Astronaut (with a physical disability)’ will undergo a review of their disability by the ESA Medical Board and might need to undergo additional medical tests.

Interview Round 2 is the last selection stage, usually consisting of an interview with the ESA Director General, after which the final decision will be taken.
The entire selection process is extensive and will take over a year. Please prepare yourself for this strenuous process and the corresponding waiting time.

After each selection stage, only those candidates who meet the requirements and perform the best in the tests will continue. You will be notified after each stage whether or not you have been successful, and can proceed. We are expecting to receive a large number of applications and it may take some time before you are informed about the outcome of any given stage.

For this reason, while every candidate will be informed by email of the outcome of their application, only those who reach Stage 5 of the selection process can be given verbal feedback, upon request.

If you succeed at any stage: congratulations, you will be one step closer to becoming an astronaut!

The astronaut selection is highly competitive and geared towards a very specific candidate profile. ESA offers many other exciting job opportunities.

We are currently planning for all test phases and interview rounds to be held face-to-face, requiring travel to different locations across Europe. Unless COVID-19 measures are lifted in the near future, travel restrictions will need to be taken into account and protective measures put in place, which may affect the timeline.

ESA reserves the right to conduct additional selection stages if necessary (for example, further medical examinations, tests or interviews).
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HOW TO BECOME AN ASTRONAUT

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→ VACANCY NOTICE
There are two vacancy notices, published on 31 March 2021, one titled ‘Astronaut’ and one titled ‘Astronaut (with a physical disability)’. Both vacancy notices have the same requirements, with one notable difference: **only candidates with an eligible physical disability will be considered in the selection process for the vacancy notice for an Astronaut (with a physical disability).**

The duties of an astronaut require moderate to arduous physical exertion involving walking, running, standing, crouching, crawling and potential exposure to inclement weather. Therefore, astronauts need to be willing to perform arduous physical activities as part of their duties.

Astronaut candidates will be required to pass a swimming test during the first month of training. Therefore, astronauts need to be proficient swimmers or willing to submit to a swimming test.

The duties of an astronaut require participation in flight operations during parabolic flights aiming to simulate microgravity conditions. Therefore, astronauts need to be willing to undergo this type of flight training.

To simulate microgravity in space, astronaut candidates and astronauts participate in training that requires extended time underwater (up to eight hours a day), using scuba gear or an adaptation of one of the existing extravehicular spacesuits (e.g. NASA’s Extravehicular Mobility Unit (EMU) or Russia’s Orlan suit). Therefore, astronauts need to be willing to spend extended time training underwater.

The vacancy notices show the minimum requirements that every candidate must fulfil, as well as asset criteria that are considered highly desirable and will play an important role in the shortlisting and eventual selection of candidates.

Each successful candidate will undergo an extensive training programme. Therefore, in addition to the criteria listed in the vacancy notices, the following requirements apply:
To be mobile in certain locations, astronauts must hold a driving licence. Candidates who do not yet possess a valid driving licence for their home country, or an international driving licence, need to be willing to obtain one.

It is paramount that astronauts work well in a team, in confined spaces and under stressful conditions. Experience in working as part of a team to achieve challenging objectives is an asset.

Space travel is associated with many risks and dangers. Therefore, it would be an asset if applicants have already experienced activities with personal exposure which required a sound capability of risk management.

Each space mission represents an extremely large investment for all stakeholders. For this reason, and to ensure that each astronaut recruited has the possibility to fly at least two missions during their employment with ESA, ESA is obliged to set a maximum age limit of 50 years. Any applications from candidates over the age of 50 at the time of application cannot be taken further in the selection process.

If you are truly motivated and meet the minimum requirements, even if you are unsure whether you fulfil all the asset criteria, we encourage you to apply.
To overcome the challenges and face the complexities of such a hostile environment as space, astronauts need to comply with a set of physical, medical and psychological health standards.

Being an astronaut is extremely demanding on the body and mind, with long periods away from family and friends, a heavy workload, irregular working hours and challenging activities.

The health and wellbeing of an astronaut and their whole team is a prerequisite for the success of any mission. For these reasons, all applicants for the vacancy of Astronaut must upload with their application form an European Part-MED, Class 2 (Private Pilot) medical certificate issued by an aviation medical examiner or aeromedical centre. For the purpose of the astronaut selection, ESA will accept UK CAA and Canada CAR certificates for private pilots. USA FAA certificates for private pilots can also be accepted by equivalence. It is not necessary to hold an actual pilot licence but candidates need to be medically fit to perform the duties of a private pilot. The medical certificate will be held in your application file and will only be accessible by the ESA staff responsible for the first screening of applications and the ESA medical board.

In view of the specific demands placed on astronauts, both in training and in space, the selection process will include a particular focus on psychological health, using psychometric testing in many of the selection stages. In addition, the selection process includes a medical screening based on international standards for long-duration missions in space.

ESA’s Human Space Exploration programmes are implemented in partnership with other space agencies and activities are shared between them. ESA has to assign astronauts who comply with the body size requirements of the vehicles used by partner agencies. These requirements are dictated by technical constraints: rejection of applications who do not fulfil these requirements implies no value judgement on the relevant candidate.
Astronaut applicants must have:

- A height **between 150 and 190 cm** to enable assignment to space missions using current space suits and vehicles. Applicants under 130 cm may be eligible for the ‘Astronaut (with a physical disability)’ selection.

- A Body Mass Index (BMI) representing a **normal weight** (as defined by the World Health Organization).

- Visual acuity in line with the requirements for private pilots.

- Hearing capacity of **25 dB or better per ear**. Astronauts are sometimes exposed to high levels of noise while at the same time needing to ensure accurate communication over various devices and in noisy environments.
For the first time, ESA will also establish an astronaut reserve. This group will comprise approximately 20 of the best remaining candidates. Candidates who agree to join the reserve will not be employed as ESA staff members. However, they will be required to maintain an annual medical certification and will be offered general training opportunities at EAC. This will require them to be at EAC for approximately one week per year. Astronauts in the reserve may be called and trained for missions when and if they arise. They will remain employed by their current employers under a letter of agreement with ESA for their participation in the reserve, that will be presented to the candidates after the selection for their consideration. If and when asked to conduct a mission, they will need to sign a letter of appointment with ESA for the duration of the mission.

All astronauts, whether in the reserve or in the corps, will need to successfully pass the selection process.
The position of ESA astronaut is classified within the A2-A4 grade band of the Coordinated Organisations’ salary scale with a monthly base net salary ranging from €5400–8600, depending upon the number of years of relevant professional experience.

ESA staff members have the status of international civil servants and are therefore exempt from national income tax in ESA Member States, in line with Annex I of the ESA Convention.

Benefits and allowances such as expatriation allowances, ESA childcare facilities and family allowance. Expatriated staff are also entitled to an education allowance whereby ESA contributes towards the educational costs of their children.

A relocation support package for those moving from their home country to work for ESA. This consists of help in finding accommodation, reimbursement of removal expenses, plus an installation allowance to help with the costs associated with settling into a new home.

Medical insurance and pension packages, with a current retirement age of 63.

Yearly adjustment and/or monetary rewards depending on performance.

Six weeks of paid holiday per year plus an additional 12 public holidays.

Expatriated staff are also entitled to home leave every two years, which consists of a paid trip for themselves and their family back to their home country and an additional eight days of leave.

Any salary, benefits and allowances will be paid according to ESA’s Staff Regulation Rules and Instructions.

If you are offered an ESA staff position, you will receive a detailed explanation of the legal framework pertaining to the working conditions.
JOIN THE PARASTRONAUT FLY! FEASIBILITY PROJECT

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→ VACANCY NOTICE
In a first for ESA and human spaceflight worldwide, ESA is launching a call for interest for individual(s) who are psychologically, cognitively, technically and professionally qualified to be an astronaut, but who live with a physical disability that would normally prevent them from being selected due to the requirements imposed by the use of current space hardware.

The intention of the vacancy of ‘Astronaut (with a physical disability)’ is to select individual(s) with a specific physical disability to join ESA’s astronaut reserve.

The successful candidate(s) will become part of the Parastronaut Fly! Feasibility Project investigating the feasibility of sending an astronaut living with a physical disability into space. They will contribute to testing the boundaries of science and technology to find innovative ways of approaching space travel. Their work will involve overcoming barriers, conducting extensive research, adapting existing systems and possibly developing and building new systems.

The project will seek operational and technological solutions to enable a person with a disability to conduct space missions, including working as an astronaut on the International Space Station. In collaboration with ESA’s Member States, partner space agencies, stakeholders and industry, it will consider how astronaut training can be adapted for a person with a physical disability, what physical impact space travel will have on them, what type of capsule will allow them to reach the Space Station and whether adjustments to the vehicle or the Station are needed or possible. In all of this, it will be of utmost importance to mitigate the risks of space travel and ensure the safety and security of the individual and their team.
There are two vacancy notices, published on 31 March 2021, one titled ‘Astronaut’ and one titled ‘Astronaut (with a physical disability)’. Both vacancy notices have the same requirements, with one notable difference: only candidates with an eligible physical disability will be considered in the selection process for the vacancy notice for an Astronaut (with a physical disability).

The vacancy notices show the minimum requirements that every candidate must fulfil, as well as asset criteria that are considered highly desirable and will play an important role in the shortlisting and eventual selection of candidates. In addition to the criteria listed in the vacancy notice, the following requirements apply:

- **Physical Activities**: The duties of an astronaut require moderate to arduous physical exertion involving walking, running, standing, crouching, crawling and potential exposure to inclement weather. Therefore, astronauts need to be willing to perform arduous physical activities as part of their duties.

- **Proiciency in Swimming**: Astronaut candidates will be required to pass a swimming test during the first month of training. Therefore, astronauts need to be proficient swimmers or willing to submit to a swimming test.

- **Flight Operations**: The duties of an astronaut require participation in flight operations during parabolic flights aiming to simulate microgravity conditions. Therefore, astronauts need to be willing to undergo this type of flight training.

- **Extensive Under-Water Training**: To simulate microgravity in space, astronaut candidates and astronauts participate in training that requires extended time underwater (up to eight hours a day), using scuba gear or an adaptation of one of the existing extravehicular spacesuits (e.g. NASA’s Extravehicular Mobility Unit (EMU) or Russia’s Orlan suit). Therefore, astronauts need to be willing to spend extended time training underwater.
To be mobile in certain locations, astronauts must hold a driving licence. Candidates who do not yet possess a valid driving licence for their home country, or an international driving licence, need to be willing to obtain one.

It is paramount that astronauts work well in a team, in confined spaces and under stressful conditions. Experience in working as part of a team to achieve challenging objectives is an asset.

Space travel is associated with many risks and dangers. Therefore, it would be an asset if applicants have already experienced activities with personal exposure which required a sound capability of risk management.

Each space mission represents an extremely large investment for all stakeholders. For this reason, and to ensure that each astronaut recruited has the possibility to fly at least two missions during their employment with ESA, ESA is obliged to set a maximum age limit of 50 years. Any applications from candidates over the age of 50 at the time of application cannot be taken further in the selection process.

If you are truly motivated and meet the minimum requirements, even if you are unsure whether you fulfil all the asset criteria, we encourage you to apply.
The role of an astronaut requires certain abilities to ensure safety and security and to perform work satisfactorily. We have adopted a methodology where eligible disabilities have been chosen by comparing the needs of this vacancy with the characteristics of each class of disabilities.

This is similar to the approach of paralympic sport where each sport requires different abilities and has its own classification. To define the classification for an astronaut with a disability, the categorisations and definitions published by the Paralympic Committee (Classification Rules and Regulations Edition of February 2018 and the Explanatory Guide to Paralympic Classification of December 2019) were used as a basis.

Furthermore, we have taken into consideration how much adjustment of existing devices or instruments would be realistic within the parameters and scope of the currently available technologies.

The eligible disabilities below have been established to:

- determine who is eligible to compete in the selection process;
- ensure that each eligible candidate has an equal chance in the selection process;
- maximise the probability that the successful candidate will be able to train and ultimately fulfil the tasks of an astronaut during a space mission (while recognising that the biomechanical execution of specific tasks may differ because of the disability and thus affect performance).
To ensure that the successful candidate is capable of fulfilling the duties and responsibilities of an ESA astronaut, we have limited eligibility to the following physical disabilities:

- **Lower limb deficiency** (e.g. due to amputation or congenital limb deficiency) as follows:
  - Single or double foot deficiency **through the ankle**;
  - Single or double leg deficiency **below the knee**.

- **Leg length difference** (shortened limbs at birth or as a result of trauma).

- **Short stature** (<130 cm).

The essential abilities below have been taken into account when determining the eligible disabilities:

- **Read** procedures, labels, and indicators with the help of **minimal visual aids**;

- **Execute** verbal commands and understand safety and emergency instructions;

- **Verbally communicate** with ground and the other crew members;

- **Operate, maintain and repair systems** (e.g. robotic manipulators) requiring fine motor skills, and ability to execute intricate manual tasks;

- **Stand, move autonomously and use one's muscles in a controlled way to the extent of being able to** **self-care while in orbit**;

- **Have the psychological ability to remain calm** under pressure and in situations of high stress;

- **Work in confined spaces** within a small team over **long periods**.

A person with any other disability than the eligible ones, will not be considered in the selection process for the vacancy of Astronaut (with a physical disability), even if they also have an eligible disability.
At the end of the selection process for the vacancy of ‘Astronaut (with a physical disability)’, ESA will select candidate(s) with a physical disability who will be offered a place in the ESA astronaut reserve to participate in the Parastronaut Fly! Feasibility Project.

This reserve will also include an estimated 20 of the best candidates who were not recruited at the end of the selection process for the ‘Astronaut’ vacancy notice.

Astronauts in the reserve will not be employed as ESA staff members. They will, however, be required to maintain a yearly medical certification and will be offered some introductory training opportunities at EAC. This will require them to be at the EAC approximately one week per year.

Astronauts in the reserve may be called and trained for missions when and if they arise. They will remain employed by their current employers under a letter of agreement with ESA for their participation in the reserve, that will be presented to the candidates after the selection for their consideration. If and when asked to conduct a mission, they will need to sign a letter of appointment with ESA for the duration of the mission.

All astronauts, whether in the reserve or in the corps, will need to successfully pass the selection process.
Join us

ESA recruits more than astronauts...

Discover other ways to join us.

From junior opportunities to expert and senior roles, we are always on the lookout for new talent to join our teams. Not only in engineering or science, but also in IT, business and administration services.

Most of all, we want future colleagues who are team players, passionate about space and motivated by our multicultural environment.

Visit our Careers website to explore our vacancies, share them with your network and find your place in space at ESA.

#ESArerecruits
ESA is an equal opportunity employer, committed to achieving diversity within the workforce and creating an inclusive working environment. For this purpose, we welcome applications from all qualified candidates irrespective of gender, sexual orientation, ethnicity, beliefs, age, disability or other characteristics. Applications from women are encouraged.

More information:
- Astronaut selection website
- ESA Careers website
- www.esa.int

Follow us on social media: