→ EUROPEAN ASTRO PI CHALLENGE 2019/20 MISSION ZERO GUIDELINES

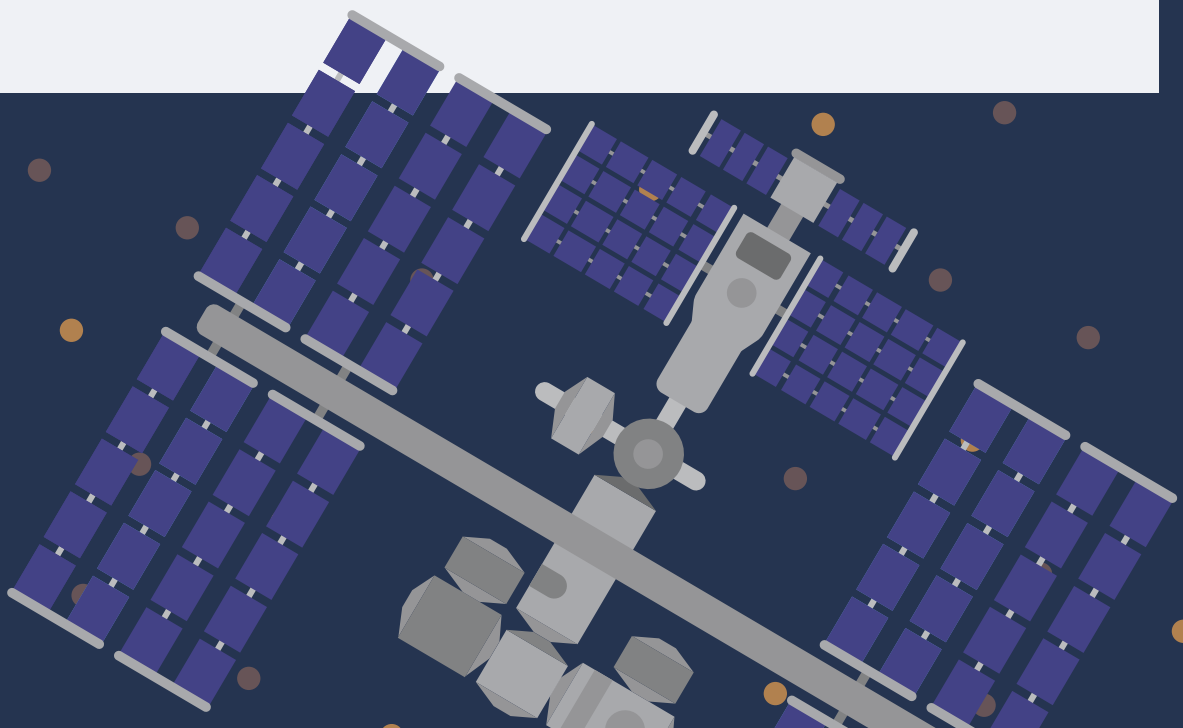
esa Raspberry Pi

→ INTRODUCTION

The European Astro Pi Challenge is an ESA Education project run in collaboration with the Raspberry Pi Foundation. It offers students and young people the amazing opportunity to conduct scientific investigations in space by writing computer programs that run on Raspberry Pi computers on board the International Space Station (ISS).

The Astro Pi Challenge is divided into two missions with different levels of complexity: Mission Zero and Mission Space Lab. This document is your guide to participating in Mission Zero.

Mission Zero offers participants up to 14 years old the chance to have their code run on the ISS! Teams write a simple program to display a message and temperature reading on an Astro Pi computer, for the astronauts to see as they go about their daily tasks on the ISS. No special hardware or prior coding skills are needed, and all teams that follow the challenge rules are guaranteed to have their programs run in space!



→ MISSION ZERO GUIDELINES 2019/20

Mission Zero can be completed in an afternoon and on any computer with internet access. Students and young people work in teams of two to four people and follow along with our handy guide to write a short Python program that shows the team's chosen message for the ISS astronauts and an air temperature reading on the Astro Pi computer screen. No extra hardware is needed, and everything can be done in a web browser.

Activity	Date
Challenge launch	12 September 2019
Challenge end	20 March 2020
Confirmation of flight status	May 2020
Certificates delivered to teams	May/June 2020

→ RULES FOR PARTICIPATION

To take part, teams must:

- Be made up of students/young people who each are no older than 14 years
- Have at least two and at most four students/young people as members
- Be supervised by a teacher, mentor, or educator, who will be the point of contact with the Astro Pi team
- Be made up of at least 50% team members who are citizens of an ESA Member State[1] or Slovenia, Canada, or Malta

In addition, each team member must be at least **one of** the following:

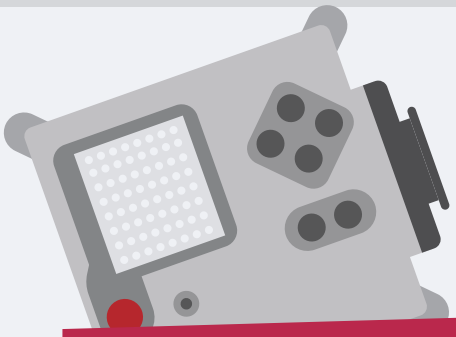
- Enrolled full-time in a primary or secondary school in an ESA Member State[1] or Slovenia, Canada, or Malta
- Homeschooled (certified by the National Ministry of Education or delegated authority in an ESA Member State or Slovenia, Canada, or Malta)
- A member of a club or after-school group (such as Code Club, CoderDojo, or Scouts) located in an ESA Member State or Slovenia, Canada, or Malta

Provided the team's program doesn't contain any bad language or unpleasantness, it's guaranteed to run on the International Space Station for 30 seconds in May 2020. Each team member will then receive an electronic certificate recording the exact start and end of their program's run — their piece of space science history to keep!

The teacher/mentor has the responsibility to register on the Astro Pi website. There is no limit to the number of teams a school or club can enter, but each student or young person can only be part of one team, and each team can submit only one entry.

[1] **ESA Member States in 2019:**
Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, United Kingdom

ESA will also accept entries from primary or secondary schools located outside an ESA Member State only if such schools are officially authorised and/or certified by the official Education authorities of an ESA Member State (for instance, French schools outside Europe officially recognised by the French Ministry of Education or delegated authority).



→ HOW TO PARTICIPATE

1. Head to the Astro Pi website **astro-pi.org**. If the Mission Zero challenge hasn't launched yet, sign up to the Astro Pi newsletter on the website to keep in touch.

2. Teachers/mentors register their team(s) on the website and receive a unique classroom code. All teams that are supervised by the same teacher/mentor use the same classroom code when submitting their entries.

3. Teams of students/young people follow along with our guide **(rpf.io/mzproject)** to complete the programming activity using the Mission Zero Sense HAT web emulator.

4. The teams submit their finished programs through the Mission Zero Sense HAT web emulator. A program cannot be changed once it has been submitted. For each team's entry, the teacher/mentor receives an email receipt with the team members' details and a link to a snapshot of their program.

5. All entries that follow the challenge rules are automatically granted flight status. The successful teams get to have their programs run in space in May 2020!

6. In June 2020, teachers/mentors receive their teams' official Mission Zero certificates by email.

The deadline for submitting entries for Astro Pi Mission Zero is **20 March 2020**. Late entries, and entries that are not submitted through the Sense HAT web emulator for Mission Zero, cannot be accepted.

Thank you for your interest in the European Astro Pi Challenge: Mission Zero!

If you'd like more information, or updates on the challenge, head to www.astro-pi.org

For resources and project ideas, head to astro-pi.org/resources

If you have any questions, reach out to the Astro Pi team at astropi@esa.int or follow us on Twitter @astro_pi

The European Astro Pi Challenge is an ESA Education programme run in collaboration with the Raspberry Pi Foundation.

For more information on ESA Education programmes, head to www.esa.int/Education

For more information on the Raspberry Pi Foundation, head to www.raspberrypi.org