Progetto Dirac's Nephews

Chosen theme: Life in Space

What are the main objectives of your mission?

The main objective of our mission is to detect a magnetic monopole which is an hypothetical elementary particle consisting in an isolated magnetic charge. Magnetic monopoles' existence was initially proposed in 1931 by Paul Dirac, these particles are expected to be very massive and have a large energy loss due to ionization when they cross the atmosphere.

Describe how you will achieve your mission objectives

Identify the sensors that you will use and the data that will be collected.

In order to detect magnetic monopoles we will search for particles showers in the atmosphere, in fact, magnetic monopoles would be detected as a positive/negative spike in the magnetic field's measurements and after a millisecond could produce a shower in the atmosphere. To do this we will use the magnetometer embedded in the AstroPi that will provide us the measurements of the magnetic field and the IR camera which will acquire the images before, during and after the event of the particle shower. The data collected will be written in binary on a file.

What do you think the results from the ISS will be? Explain your prediction.

We expect that the results will be a series of chunks that will contain the measurements of the magnetometer

Please estimate how much disk space your experiment will use, in Megabytes.

Do a full three-hour test run of your experiment and look at the size of the data/image files that are produced. This is used for operational planning only.

About 200 Megabytes.

Commands to install required Python packages

To help us get your code running, please list below the terminal commands used to install any additional Python modules that your code depends on. Leave blank if you did not install additional Python modules.

Upload code (zip / tar)

TEAM INFORMATION

Team name

Dirac’s nephews

Number of the team members (2-6)

4

Number of female team members

0

Team member names

Giordani Davide
Giongo Daniele
Taufer Alessandro
Marchetti Davide

Student age group

17 - 19

TEACHER AND SCHOOL INFORMATION

Teacher 1 Name

Teacher 1 E-mail address:

- **Enter email**
- **Confirm email**

Teacher 1 phone

Teacher 2 Name

Name of school or organisation

ITT Buonarroti Pozzo

SCHOOL ADDRESS

Street address

Via Brigata Acqui, 15

Address line 2

City

Trento

Region

Trentino Alto-Adige

Postal Code

38122

Country

Italy

What type of organisation is this?

Secondary School(government funded)

PARTECIPANT SURVEY : Feedback about competition

How sufficient was time allocated for phase 1?
Fairly
How sufficient was time allocated for phase 2?
Moderately
How straightforward did you find the process of taking part in the competition?
Fairly
How useful was the supporting material, videos and webinar?
Fairly
How valuable do you think this experience was for your students?

Did you like being given a specific theme to focus on?
Yes
Please estimate how many hours the team as a whole spent on the project?
For example if your team has 4 members and each of them spent 1 hour, the total would be 4 hours. This information is not used by the judges.
About 14 hours.

FEEDBACK ABOUT THE EQUIPMENT
Did you build a 3D printed Astro Pi flight unit?
No
How important was the free equipment to you in taking part in Astro Pi?
Very
Did you use other equipment to work on your Astro Pi entry?
Yes
QUESTIONS ABOUT BENEFITS FOR STUDENTS
My students improved their programming skills due to taking part in Astro Pi
Fairly
My students improved their soft skills (teamwork, responsibility, communication) due to taking part in Astro Pi
Fairly

My students improved their science skills due to taking part in Astro Pi
Moderately
QUESTIONS ABOUT FUTURE PARTICIPATION
How interested would you and your students be in taking part in future Astro Pi competitions?

Fairly

Do you have any other comments about your experience taking part in the European Astro Pi challenge?