AstroPi Mission Lab Project

The overall purpose of this investigation is to monitor the impact of machinery on the atmosphere inside the Columbus module, using the sensors provided on the Astro Pi Ed. The Astro Pi ED will independently measure variations in atmospheric conditions based on direct exposure to sunlight, and take in to account the impact of solar radiation, magnetic forces and the constant movement of the ISS. We know there is a huge fluctuation in atmospheric conditions and we will collect data on how machinery in the Columbus module attempts to regulate this temperature, pressure and humidity. From this data, we will explore the casual relationship between the exposure to sunlight and the effect it has on the computer system that controls the temperature, pressure and humidity. Our prediction is when there is direct exposure to sunlight it will cause temperature and humidity to increase, causing the computer system to kick in and regulate these causing a fluctuation in atmospheric conditions. As a contingency plan, we will use the remaining three sensors to track the position of the ISS in orbit based on the magnetic strength of the Earth and speed of the station.

We plan to create a program using ‘python 2.7’ legacy version that records the data collected by the sensors on the Astro Pi Ed. ‘Astro-Pi 1.1.8’ and ‘Sense-Hat 2.2.0’ will be used to create the bulk of the program. For storing data, we are utilising text files to ensure all data is backed up to the micro SD card. As a precaution, we are using ‘twoDigit 1.5’ for error reporting; it displays a 1 when the Astro Pi is operational and numbers between 2-9 will represent an error code. Furthermore, we are using **BPT** to ensure an isolated environment is created to stop the experiment breaching any terms of operation which could affect the reliability of data. The sensors we will be using for the experiment will be the thermometer, barometer, hygrometer and the camera used to measure sunlight. The thermometer will gather temperature in degrees, the barometer, pressure in Pascal Pa and the hygrometer humidity, measured in percentage.