

SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Lift-Off - Secondary Space Education (2)

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ASTRO PI: RUNNING YOUR CODE ABOARD THE INTERNATIONAL SPACE STATION

Abstract

A team of leading UK space companies, in collaboration with the Raspberry Pi Foundation, created the Astro Pi project (www.astro-pi.org) in order to exploit the outreach possibilities offered by the flight of British ESA Astronaut Tim Peake to the ISS between December 2015 and June 2016. The activities related to this project are intended to encourage and strengthen the teaching of the science, mathematics, engineering, computing and coding curriculums, and through this stimulate the curiosity of students and motivate them towards further study of STEM subjects.

At the core of the Project is the Astro Pi Payload which was not only developed to be taken to the ISS, but also into classrooms and used by students. It consists of a Raspberry Pi B+ computer, an add-on board called the Sense HAT, a digital camera and six push buttons. The Sense HAT board was designed to host a variety of sensors and input/output devices that are useful for experiments aboard the ISS and in the classroom. The payload was qualified for spaceflight in 2015 and, in parallel, a competition was run to promote engagement between schools and the UK space industry that was supported by a broad range of learning resources.

The payload was launched into space on the Orbital ATK OA-4 Cygnus cargo freighter in December 2015 and the winning experiments were executed aboard the ISS by Tim Peake in early 2016. These generated a wide range of interesting results and earth observation images for the schools to analyse on the ground. Between February and March 2016 a second competition was run to further promote school engagement with the UK space industry. This differed from the 2015 competition, where students were given an openended brief, by posing specific challenges that must be met with code. The prize was the same, to have their code uploaded and run on the Astro Pi payload by Tim Peake.

This paper is divided into four sections. The first provides detail of the Cygnus launch and flight operations aboard the ISS; the second reviews the results of the first competition and how these were distributed and analysed by the schools; the third is dedicated to ongoing outreach events and the establishment of a long term legacy for Astro Pi and the fourth covers the second, challenge based, competition including its results, impact and engagement, dissemination of teaching resources, evaluation process, and lessons learned.