

Volcanic Ash Cloud Imaging from Space with PROVE-Pathfinder

Code: 21/34

Company: The **University of Bristol** Aerospace Engineering, Physics and Earth Sciences departments are working together on this mission in tandem with our industrial partners.

Location: University of Bristol or online (as appropriate)

Company Description:

The supervision team comprises 2 academics from the University of Bristol. The intern would be based at the University of Bristol, but would participate in weekly telecons with the industry partners and with the team of students and staff involved in the mission.

This project would be based in the University of Bristol's dedicated satellite lab which has a ground station and clean room, as well as other specialised testing equipment. The student would be involved in programming for satellite hardware testing. It is hoped to include thermal vacuum testing, vibration testing and Electro Magnetic Compatibility testing which may involve travel off site to some of the facilities. This travel would be supported financially by the University

Project Description:

The University of Bristol is working with a large industrial partner and a UK SME (unfortunately currently confidential) on an ongoing CubeSat mission. The payloads are an infrared camera for volcanic plume tomography (Pointable Radiometer for Observation of Volcanic Emissions (PROVE) and a visible camera.

The aim of this activity is to contribute towards the design, build and testing of these payloads to image volcanic ash clouds. It is an independent project but contributes towards the University of Bristol Satellite programme.

The aim of this internship is to offer undergraduate university students the opportunity to gain industry-relevant, hands-on experience in satellite design, build, testing, and integration. The University of Bristol is running a CubeSat project to observe ash clouds from satellite image data using infrared and visible cameras with a launch in 2022. It builds on recent work at the University of Bristol to measure ash clouds using fixed cameras and UAV images.

A prototype electronics board has been developed and is now being tested with the Beaglebone onboard computer (Figure 1). A further iteration will be ready for testing and subsequent development by the undergraduate intern. This will undergo full laboratory and "flatsat" testing with the cameras, as well as electrical and data interface testing. The aim is to have a flight design finalised by the end of the internship.

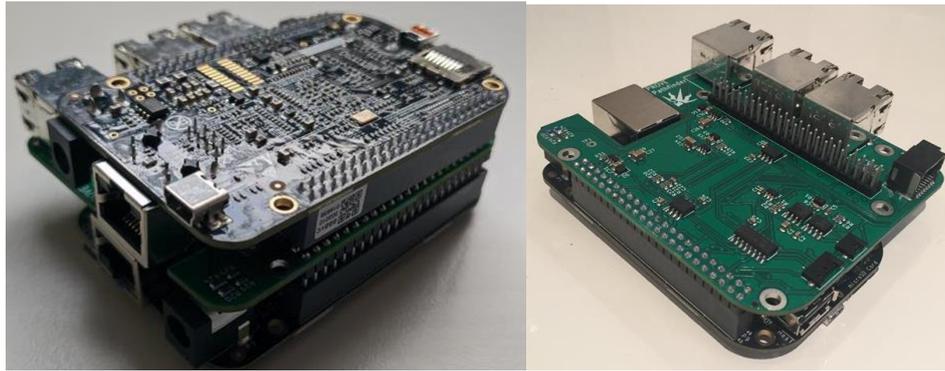


Figure 1 (left) Prototype electronics board in “sandwich” configuration showing one of two Beaglebone onboard computers on top. (right) top Beaglebone removed to show student-designed electronics board.

Essential access to the University buildings is likely to be permitted, even under lockdown, which should permit testing with specialised equipment. The flight payload will then be integrated into the satellite bus for full testing of the entire system.

This internship has the potential to make a real contribution to a live spacecraft project. The intent is that this project will better inform the student’s career choices, increase their value to prospective employers, giving them hands on skills with space hardware, an impressive addition to their CV and building their knowledge of spacecraft electronics development.

Applicant Specification:

Studying for a bachelors or master’s degree in computing/electronics/aerospace/space engineering/physics

Minimum Requirements:

- Basic knowledge of software programming esp. Python and/or C
- Proven motivation to work in the space domain
- Ability to communicate effectively both written and verbally

Preferred Additional Requirements:

- Experience of space and/or earth observation projects
- Experience of working in teams
- Experience of software programming in Real time systems (KubOS an advantage) and Assembly language
- Experience of electronics manufacture and test techniques including soldering

Further details:

8 weeks minimum fixed term contract to be agreed with successful candidate. Virtual Induction Event to be held on 21 June, 2021. To complete before the start of the next academic year. Salary is £1,500 per calendar month gross.

Closing Date for Applications: 5pm Wednesday 26 May

Applications should be made through the online form attaching a CV, before the closing date. Please note that elements of the form left incomplete will be deemed to render the application ineligible. They will be checked for eligibility and forwarded to the employer.