

IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)  
New Worlds - Non-Traditional Space Education and Outreach (7)

Author: Ms. Jodie Howlett  
UK Space Agency, United Kingdom

Mr. Gidon Gautel  
Bryce Space and Technology, United Kingdom

Mr. Joe Gibbs  
School of Engineering, University of Glasgow, United Kingdom

THE UK SPACE AGENCY'S NANOSAT DESIGN COMPETITION – A NOVEL SPACE OUTREACH  
INITIATIVE

**Abstract**

To sustain and further catalyse the rapid growth that the UK space sector is currently experiencing, it is estimated that around 30,000 additional highly skilled workers are needed by 2030. Employers need to be able to recruit and train more staff if our space sector is to continue to thrive. A new generation of engineers and scientists are required to meet this demand and to drive forward the delivery the UK's National Space Strategy.

Announced at the 2021 G7 Summit, the LaunchUK Nanosat Design Competition provided UK-based young people with the opportunity to win a share of £600K with which to design and build a climate-change focused nanosat. The competition, led by the UK Space Agency (UKSA) in partnership with BryceTech, Spacetime Development, Space Store, and the Satellite Applications Catapult, was conceived over three months, which involved producing a communication strategy, establishing digital infrastructure, coordinating mission reviews/milestones, and onboarding mentors. Applications opened in November 2021 following a launch event. Teams of up to 10 individuals (aged 16+) had two months to submit Phase A datapacks for their mission. Over 40 teams, from a variety of educational/demographic backgrounds, applied.

Five teams were shortlisted to deliver Phase B of their mission, each supported by mentors from industry and academia. Throughout this phase, teams benefited from various interdisciplinary seminars, from project management to payload selection and design. They gained valuable experience during System Requirements Reviews with UKSA engineers, and by compiling documentation for the Preliminary Design Review, concluding Phase B. The winning team, OirthirSAT, was announced at Farnborough International Airshow 2022, and are now well underway with Phase C of their mission's development. OirthirSAT's mission comprises a 3U nanosatellite designed to capture multispectral imagery of the UK's coastlines. Onboard data processing capability will automatically extract coastal boundaries to deliver costal mapping data. This ultimately gives coastal managers and decision-makers the most up-to-date information on how coasts are being impacted by climate change, and who is most adversely affected by these changes. The nanosatellite also hosts a novel dragsail design to aid sustainable end-of-life operations.

Key Performance Indicators (KPIs) have been collected throughout the competition, including social media metrics and targeted surveys. These are used to assess the competition's impact on youth engagement in STEM and in space. This paper details the planning and execution of the competition, detailing lessons learned to inform and inspire future non-traditional outreach initiatives.