

SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Lift Off - Secondary Space Education (1) (2A)

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HIGH SCHOOL STUDENTS CODING FOR SPACE: THE ZERO ROBOTICS COMPETITION

Abstract

Zero Robotics is an International Programming competition that gives high school students from around the world the opportunity to have their code run on the NASA SPHERES robots on-board the International Space Station. Students work in teams to develop code to control the motion of the SPHERES to carry out a series of tasks in a one-on-one game against another team. Code development and initial rounds of the competition are run in an online simulator. At the semi-final stage, international alliances of three teams are formed to compete for a place in the International Space Station Final, which sees the students' code run on board the actual SPHERES robots, in space.

The fundamental goal of Zero Robotics is to inspire. This inspiration comes through both; a) providing an exciting avenue for students to excel and see how they can apply their skills, and b) providing a motivating and engaging way to learn about programming and engineering and see what is possible for to achieve through pursuing STEM fields. In addition to coding, the students learn about maths, physics, robotics and aerospace engineering; all to understand how to effectively control the SPHERES. The competition also requires rich development of skills in teamwork, project planning, and international collaboration.

The competition currently runs for teams throughout Europe, Russia, USA, Mexico, and Australia, with participation at zero cost to the teams. The competition first started in 2009, and was first introduced to Australia in 2015.

This paper will outline the Zero Robotics Competition including: the format of the competition, how students compete, what the challenges are, how the International Space Station finals work, and what students learn through their involvement. Additionally, there will be a focus on how the competition is run in Australia. The impact of the program on the students will then be assessed, followed by a discussion of the future plans for Zero Robotics.