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

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THE EUROPEAN CANSAT COMPETITION – LEARNING STEM BY BUILDING A PICOSATELLITE

Abstract

The European CanSat Competition is a school project of European scale led by the Education Office of the European Space Agency. It started in 2010 and the 9th edition is running in 2019. The impact of this STEM Education project has been continually increasing since its origin, with national competitions currently taking place in 15 ESA Members States, extending the reach of the project by two orders of magnitude.

CanSat is aimed at secondary school students (14-20 years old), studying in a school from an ESA Member or Associate State. Student teams can have 4-6 participants and need to be supervised by a teacher. The team's objective is to build a small satellite the size of a soft drinks can that will be launched in a small rocket up to 1 km. Teams must complete two missions: the primary mission, mandatory for all, challenges the students to measure air temperature and pressure, and receive these data at their ground station every second; the secondary mission is open to the students' imagination, and can range from science to engineering experiments.

CanSat is an interdisciplinary project as it covers STEM subjects including programming, technology (electronics), mathematics and physics, part of the Secondary STEM Education curricula in Europe. Depending on the team's secondary mission, other subject content (e.g. biology, geology) can be also explored. This initiative falls under 'Project-Based Learning' pedagogy, an active and student-centered approach, where the students are presented with an authentic, real life problem and use their STEM skills in order to solve it. The learning objectives of the project are divided into four blocks: Technical Achievement, Scientific Value, Professional Competences and Outreach. While 'Technical achievement', 'Scientific Value' and 'Outreach' fields focus on the more cognitive (concepts) and skills-based (procedures) learning outcomes, within the 'Professional Competences' field the learning outcomes pertaining to attitudes are assessed. This way, aspects such as curiosity, adaptability and teamwork are fostered while the students core knowledge on STEM subjects is enhanced.