

SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Interactive Presentations (IP)

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STUDENT CEF AT SAPIENZA - UNIVERSITY OF ROME: PRELIMINARY DESIGN OF LEDSAT
CUBESAT**Abstract**

Students attending the Spacecraft Design course for the MSc Degree in Space and Astronautical Engineering at Sapienza – University of Rome, had the chance to take part in a Concurrent Engineering activity for the preliminary design of the LEDSAT 1U CubeSat. The mission aims to use a LED-based technology as main payload to allow the nanosatellite orbit and attitude determination by means of ground-based optical observations. Starting from the mission concept, the involved students had to merge the activity related to the CubeSat design to the development of dedicated tools to define the main features of each subsystem. In this way, they created their own Concurrent Engineering tools in a Concurrent Engineering Facility environment. During the course, the whole class was split into subgroups, each one taking care of a subsystem or a mission aspect. Starting from the main design drivers and key performance parameters, each student team defined the main features of their subsystem, the realization procedures, and needed timing and costs. Furthermore, this activity contributed in increasing the students cooperative skills by giving the opportunity to put into practice the theoretical knowledge gathered during their academic career. At the end, the final configuration, reached by following a design iteration procedure based on the contributions coming from each team, was presented during the “3rd Space Debris Student Opportunities Workshop” at Sapienza – University of Rome. In this occasion the students were called to give a public presentation about their work and achieved results. Moreover, the LEDSAT mission design has been further improved and proposed for the ESA “Fly your Satellite!” programme. This paper

outlines the LEDSAT preliminary design, the development of the low cost CEF made by students and how this experience allowed them to understand and practice how a satellite design process is worked out.