Practical Sci. Lab

Satellite Mission Proposal Starter Guide

2025 Version 1

Version History

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Note: This document may be updated. Please check our website to access the latest edition.
https://practicalscilab.com/student-satellite-mission-proposal-competition/

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Introduction

There has been significant technological growth in space and satellite technology over the last 20 years. Now, there are successful satellite missions from high schools. A new era has begun, where space is no longer unreachable for students.

The purpose of this guide is to provide a starting point for high school students to explore the possibilities of creating a student satellite mission proposal. Further research beyond this guide is expected should the student wish to enter the mission proposal competition.

What is a CubeSat?

A CubeSat is a type of miniature satellite that follows a standard size and shape so it can be built and launched easily. The basic unit (called 1U) is a cube that measures 10 cm × 10 cm × 10 cm and usually weighs about 1 kg. By making the satellite system modular, multiple units can be combined to make bigger CubeSats, e.g. 2U, 3U, 6U, 12U.

Some useful sources and references to read.

[1]. NASA. (2024, August 15). What are SmallSats and CubeSats? - NASA. NASA. https://www.nasa.gov/what-are-smallsats-and-cubesats/
[2]. Canadian Space Agency. (2018, May). CubeSats in a nutshell. Canadian Space Agency. https://www.asc-csa.gc.ca/eng/satellites/cubesat/what-is-a-cubesat.asp
[3]. CubeSats. (2022). ESA. https://www.esa.int/Enabling_Support/Preparing_for_the_Future/Discovery_and_Preparation/CubeSats

What can miniature satellites do?

Stand on the shoulder of giants and look at what has been done before! The following references list includes some of the CubeSats and small satellites built and launched in recent years.

[4]. TJREVERB. (2016). https://activities.tjhsst.edu/cubesat/tjreverb.html
[5]. Archive of NASA Launches - NASA. Sonja Caldwell, (2021, March 2). NASA. https://www.nasa.gov/smallsat-institute/archive-of-nasa-launches/
[6]. Space Institute satellite successfully launched - The University of Auckland. Faculty of Engineering and Design, Science and technology (2025). Auckland.ac.nz. https://www.auckland.ac.nz/en/news/2025/06/30/space-institute-satellite-successfully-launched.html
[7]. KickSat Nanosatellite Mission - eoPortal. (2025). Eoportal.org. https://www.eoportal.org/satellite-missions/kicksat#eop-quick-facts-section
[8]. Kulu, E. (n.d.). Nanosatellite & CubeSat Database. Nanosats Database. https://www.nanosats.eu/database