

IAF MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)
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DEVELOPING A LOW-COST OPEN-SOURCE PLATFORM FOR CONDUCTING MICROGRAVITY
RESEARCH IN SPACE AS A VOLUNTEER STUDENT ORGANIZATION

Abstract

Orbit NTNU's vision is to become the best place in Europe to learn about satellites by letting our members get hands-on experience with real-life engineering challenges. Because Orbit aims to be a place for educational, personal, and professional growth, the need for creating something our members believe in and want to work on becomes essential. The BioSat mission aims to make this vision a reality by creating the need for new technology, challenging both old and new members in multiple ways.

BioSat will consist of a 3U mission, where 1U is reserved for a payload that can facilitate biological research in microgravity. The primary motivation for the mission is to develop an open-source platform for research that can be utilized for microgravity research in space at an extremely low cost.

The technology required to grow plants in one of the harshest conditions known to humanity will also have important implications for our own planet. Our ability to provide food for everyone is becoming increasingly difficult with an evergrowing population. This new technology can be used in areas with limited resources, such as water scarcity, extreme temperatures, and poor soil quality.

Creating solutions for low-cost plant research that is open-source will make it possible for others to iterate and improve on our design with limited resources creating a catalyst for inspiration.

BioSat will not revolutionize the way we perform long-duration missions or grow food back on earth. This is a really complex problem that will need a lot more research, testing, and failure, which no mission can do alone. We are part of an international collaborative effort to which we are contributing.

This paper will discuss the motivation and need for the BioSat mission and how we are making microgravity research more accessible to everyone by lowering costs and reducing complexity.