



Project SunSat

Sheffield University Nova Satellite - Part of the Sheffield Space Initiative

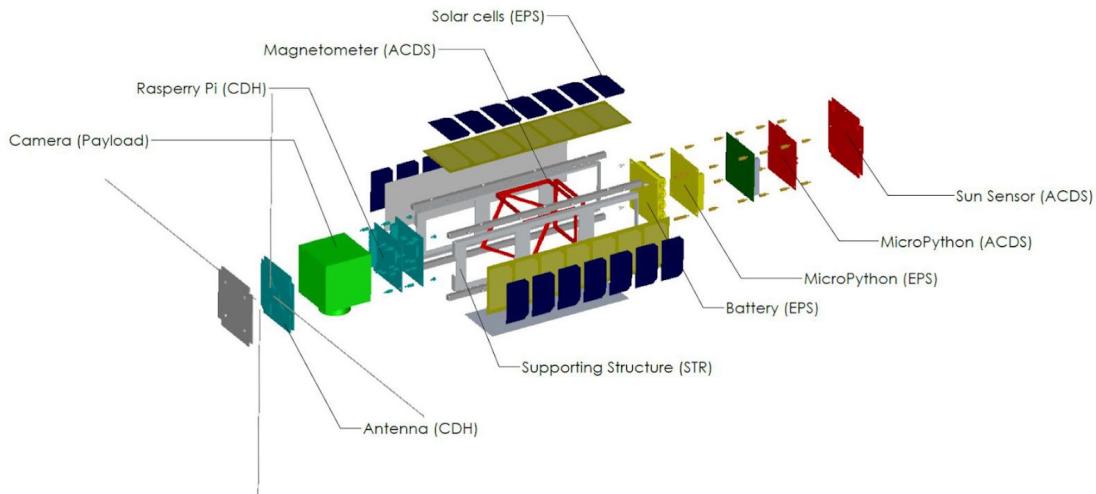
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Document issued:
02.12.2020
Document valid until:
01.07.2021

Version: 1.1

SunSat's Mission

Project SunSat is a satellite development team entirely made up of students from the University of Sheffield. SunSat aims to have a satellite (Nova-1) in orbit by 2025. Nova-1 will monitor the rate of deforestation from Low Earth Orbit (LEO) by carrying a high-resolution camera to facilitate Earth Observation.

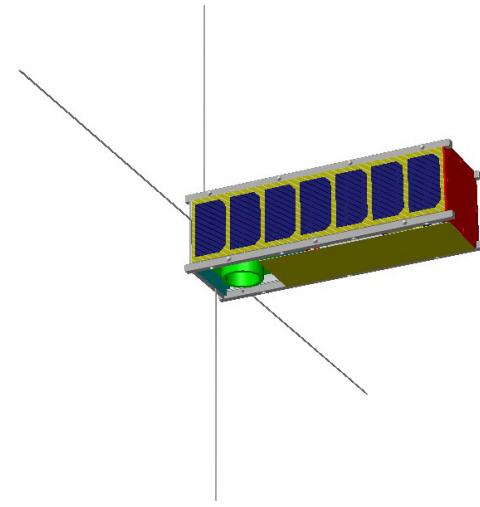


Exploded view of Nova-1

Nova-1 will be a demonstration that a student-built satellite is feasible. Future Nova satellites will be designed with flexibility and modularity in mind which means that the same core systems can be used with a variety of experiments with little to no alteration, enabling fast mission turnarounds.

In order to achieve this goal, the SunSat team needs to gain experience in satellite design. By developing near space test platforms that can support various launch vehicles, SunSat has the capability to launch exciting and novel scientific experiments into the upper atmosphere. As well as this, the development of our orbital satellite is underway.

Read on to find out about our projects this year, and how your support would help SunSat.



Our Projects

There are three primary projects that SunSat will be undertaking in the 2020/2021 academic year, each project progressing SunSat towards our mission of reaching orbit.

Spaceport America

A prototype version of Nova-1 is currently in the build phase and will be flown this summer at the Spaceport America Cup, a large spaceflight competition, in New Mexico. Nova will be launched on a sounding rocket and deployed at approximately 11km and will perform an attitude control experiment (in association with Sheffield Hallam University) during its descent.

This prototype contains many of the systems that will be used on the orbital Nova-1, such as electronics, power and communication sub-systems. This flight will test the performance of these critical parts of the satellite in operation.



Spaceport America Cup 2018 participants



SunRide's "Helen" Launch Vehicle

High Altitude Balloon

The high altitude balloon team is developing a sustainable platform for near space research experiments. During a typical balloon flight, a payload will be exposed to atmospheric pressures of less than a percent of those at sea level and temperatures of -50°C. Mission times are usually over 90 minutes. This project will give students at the University of Sheffield access to a unique, in house, testing platform. Project SunSat will open this platform to anyone who wants to send a scientific experiment into near space.



Member of the balloon team with a prototype payload frame which will carry experiments

The capability of regular balloon flights would provide a fantastic educational opportunity that students across the university and beyond will be able to experience. Initially, six flights per year will be carried out, each flight containing up to 5 research experiments. The balloon platform will contain all the required power, communications and tracking systems in order to support these launches and will be completely manufactured by students.

CanSat

When applying for internships, it is almost compulsory to have prior engineering experience in order to be a competitive applicant. CanSat was created to allow twelve first or second year engineering students to develop their skills with no barrier to entry. Each year, students are selected based on what they aim to get out of the project and not what they can already do.

These students will enter the Mach-21 CanSat competition which will bring undergraduate students from multiple universities in the UK and beyond to a spaceport in the UK. The teams will design and build CanSats, a simulation of a real satellite integrated within the volume and shape of a soft drinks can. The CanSats will be launched on small rockets to several thousand feet at Machrihanish Airbase this July. The competition is a three-day event with various rocket and satellite related workshops that these students will be able to participate in.



A CanSat team from the 2019/2020 year



Rocket the CanSats will fly on

CanSat will provide these students with the skills they need to become excellent engineers, and to let them stand out from the crowd.

How Your Support Will Help

Now that you have read a brief overview of the projects that SunSat is undertaking this year, we would like to explain how your support will benefit our students.

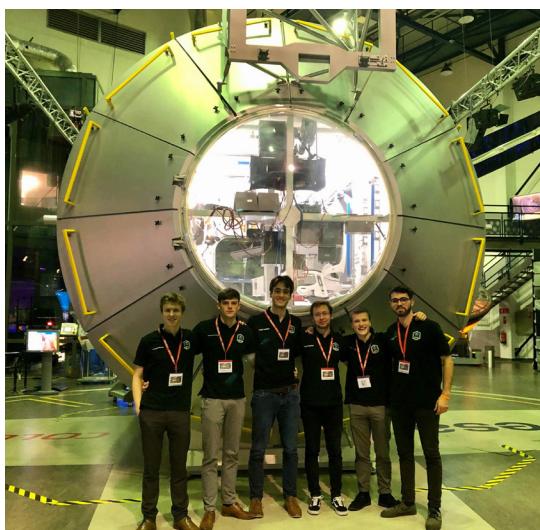
Starting with CanSat, supporting this project will help develop the skills of young engineers far beyond what standard university education can. These students will be exposed to the complete lifecycle of an engineering project: initial design, prototyping and manufacturing. During this process they will be mentored by senior team members. The competition will allow the students to network and attend workshops given by future employers and fellow space enthusiasts.

The high altitude balloon project will have an impact much wider than the engineers in SunSat. This will allow students throughout the University of Sheffield and beyond to have access to a near space environment for various experiments and projects. These projects cannot be conducted without this balloon platform. Initial support is required to get this project off the ground and then we believe that this will become self-sustaining in the future.

Finally, supporting the Spaceport America team will allow our engineers to fly their work. Having the opportunity to design and, more importantly, launch hardware



CanSat team members working on avionics pushes these engineers way beyond the expectations of a university student. Previous cohorts have competed in the REXUS programme, a European research rocket project, where they excelled. This year will see another group of students gain invaluable experience showcasing their work internationally.



SunSat members after presenting at the European Space Agency's ESTEC



Team member utilising the available advanced manufacturing facilities

Meet The Team

Management Team for Year 20/21



Mark Seward
Project Lead



Jacob Pompe
Systems
Engineer



Euan McDonald
Finance Lead



Megan Taylor
Business Develop-
ment Officer



Oliver Young
Structures Lead



**Huthayfa El-
Hames**
Avionics Lead

Team Members for Year 20/21

Sebastian Rimmer - Team Advisor

Yun Han Cho - Team Advisor

Sébastien Schillé - Web Developer

Aiman Shahizam - Avionics

Veronica Nelson - Avionics

Paul K Roberts - Avionics

Waleed Hamad - Avionics

Rory DE Haggart - Avionics

Evelina Sakalauskaite - Avionics

Albert Alvarez - Structures

Tomos Wilshaw - Structures

Alexandre Santos - Structures

Lara Willers - Structures

Ananyveer Bakshi - CanSat

Aniela A Borowczyk - CanSat

Philip Schwarzmayr - CanSat

Georgia E Morris - CanSat

Francesca R Magnasco - CanSat

Rhithika Srinivasan - CanSat

Jacob Jones - CanSat

Zhenting Kong - CanSat

Hazel E Larkin - CanSat

Jenna Sacks - CanSat

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Contact Us

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