

SpaceTEM: A project for educating Estonian and Latvian students in space technology

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Note: We expect to add more authors before the final submission of the paper

Abstract

SpaceTEM is a project that enables students to participate in a summer programme in Latvia and Estonia to learn about space STEM (science, technology, engineering and mathematics). The main goal of the programme is to give students the possibility to work on challenging projects and provide access to a work culture that promotes values that are useful for future employers. The lead partner of the project is Tartu Observatory and other cooperation partners include University of Tartu, Ventpils University College, Heliocentric Technologies Latvia, Estonian Student Satellite Foundation (ESTCube) and various companies in the space sector. This paper will focus on the ESTCube and Tartu Observatory activities in the program.

1. Introduction

SpaceTEM aims to bring together the different space technology entities including SMEs, universities, research institutions and even policy makers in order to share knowledge and ideas and to collaborate on new activities. By including students in this activity it is possible to educate and prepare the next generation of space technology engineers and scientists. The students will be able to get hands-on experience and learn to operate in the work culture of companies and engineering projects that is an essential part of education that is often not covered enough.

2. Different partners

There are various partners that are participating in the SpaceTEM project including universities, research institutions and various companies.

The Estonian Student Satellite foundation is an organisation that focuses on building nanosatellites. The upcoming nanosatellite ESTCube-2 is also a satellite platform that could be used on an interplanetary mission.

Tartu Observatory is a research institute that focuses on astrophysics, remote sensing and space technology. The space technology group is in close cooperation with the ESTCube team and also is currently building a camera for the European Student Earth Orbiter (ESEO) satellite.

The University of Tartu (UT) is Estonia's oldest and most respected higher education institution. The UT leads the process of harmonising the Estonian and Latvian business support services for space technology.

The Institute of Astronomy is a part of the University of Latvia. Its main research directions are: late evolution stars, solar physics, interstellar medium, minor bodies of Solar System including: Near Earth Objects (NEO), cosmic dust, and space debris, satellite laser ranging (SLR), and development of new instruments and methods.

Ventpils University College (VUC) is one of the most dynamically developing higher education institutions in Latvia. Within the SpaceTEM project, VUC will be one of the hubs providing supervision for interns working on products with high potential for spin-offs.

LSTC will be the Latvian counterpart in the process of harmonising the Estonian and Latvian business support services for space technology.

Garage48 HUB Tartu is the center of entrepreneurial activities in Tartu and one of the most successful and well-known start-up hubs in the EstLat region. They will help in connecting Estonian and Latvian enterprises in space technology.

In addition various companies are taking part of the traineeship program. For the 2017 summer the following companies are listed to be taking on trainees: RD ALFA Microelectronics, Heliocentric Technologies Latvia, Foundation "Institute for Environmental Solutions", Spaceit OÜ, Blue Shock Race SIA, Skeleton Technologies, BSR Liepaja SIA, Pauks SIA, Planet OS, Science Center "ZINOO", Ventspils High Technology Park.

3. SpaceTEM in ESTCube and Tartu Observatory

Students participating in the SpaceTEM project through ESTCube and Tartu Observatory are able to participate in building hardware for a satellite, testing various space technology equipment and doing various space related research.

The students are working up to 8 hours a day during a period of 2.5 months in the summer. The students are working according to a methodology based on Agile principles. They will be working together with other engineers and scientists in teams of up to 10 people related to their topic who try to solve different space technology challenges. As all problems and tasks are handled by the whole team, then this encourages working together as a team.

The participants in the project are expected to participate in the development of actual hardware and software. Through the project the organisations expect to inspire the students to work on the same projects also in the future, so the traineeship is also essential for future projects. Students who work in the space technology field make excellent engineers for many different high technology companies.

4. Summary and Conclusions

SpaceTEM is a project that enables current and future space technology activities and development

of space technology industry through creating traineeship opportunities to students. The project unites various institutions, companies and universities from Latvia and Estonia. The project enables Tartu Observatory and ESTCube to build space technology and prepare students to work in various engineering companies.

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