



Foreword

On 7 May 2013 at 5:06, the first mission to test technologies for the electric solar wind sail, which up to that moment had been a purely theoretical concept, was launched on board the Europe's new launch vehicle Vega. Launch of the ESTCube-1 nanosatellite was the culmination of an intensive period of development, started in 2008. The successful operations of ESTCube-1 have been a clear demonstration of Estonia's capabilities in the space domain. A team of partners from Finland and Germany have had a major contribution to this mission.

Behind this leap forward for Estonia is a long history and tradition for space and science. In 1810 Tartu Observatory was completed and telescope observation of space started in 1814. In 1816 Friedrich von Struve began assembly of his Geodetic Arc. His work has been internationally recognized and in 2005 this first geodetic arc was inscribed on the UNESCO World Heritage List. In 1824 the world's largest achromatic telescope of that time was installed and Friedrich von Struve started further observations from Tartu. Today Tartu Observatory hosts Northern Europe's largest Cassegrain reflector for spectroscopic observations.

In this millennium it has been recognized in Estonia that science, education, engineering capabilities, and industry have an obligation to contribute together towards the mankind's quest for space. The construction of a spacecraft reassures mastering of a broad variety of scientific, educational, and engineering disciplines for reaching success. The ambitions of the ESTCube-1 mission have been designed to be very high in research

as well as in education and support to innovation. Tartu Observatory and Estonia have shown that everything is possible for those who want to go for it. It has been proven in the best way – by example – that a new era has come to Estonia as a space nation and a future member of the European Space Agency. A new generation of scientists and engineers are ready to take the next steps together with their partners from the international space community.

This portfolio of scientific papers clearly demonstrates the leap forward. The paper by Lätt et al. gives an overview of ESTCube-1 nanosatellite mission. It is followed by the papers describing the original technological development for various subsystems of the satellite. Khurshid et al. present the future steps of the electric sail technology testing onboard the first Finnish nanosatellite Aalto-1. In Janhunen et al. a broad range of different possibilities for missions enabled by the electric solar wind sail technology is presented. Kvell et al. conclude this special issue with a mission for testing a MEMS cold gas propulsion which could be used to spin up the electric sail full mission in the future. Take a look, read, and enjoy them.

We in Aalborg University – Studentspace – in Denmark are honoured to be among the friends of this community and wish Estonia and friends many fruitful space missions in the future.

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Guest editor



ESTCube-1 team.