

PERIODIC REPORT SUMMARY

The main objective of the EstSpace project is to increase the level of international cooperation and create the necessary conditions for utilizing the existing and emerging research potential of the Estonian scientific institutes in the field of remote sensing, atmospheric physics, and astronomical research as well as provide technological support for harmonization of the radiometric and photometric measurements.

During the last period from March 2010 to February 2011 the main emphasis was put to the dissemination of the project achievements and sustainment of the created collaborating networks. The project as whole increased the visibility and collaboration of the Estonian space scientists with public, industry, enterprises and policy on national and European level. It also improved awareness of the European Union space policy on the national level. We started two new collaboration projects WaterS and ESAIL funded under FP7 in the domain of Earth Observations and Space Technology development and one FP7 Capacity proposal for project CosmoTar was submitted.

WaterS “Strategic partnership for improved basin-scale Water quality parameter retrieval from optical Signatures” is Marie Curie Industry-Academia Partnerships and Pathways project. WaterS focuses on creating conditions for strategic dynamic partnerships in the form of long-term cooperation between three excellent research groups with proven high competence and capacity in the field of remote sensing of optically complex waters and three successful and quickly developing enterprises with unique complementary expertise and tools. As the inland and near-coastal waters are under the strongest anthropogenic impact, there is a need for a better and more efficient way to monitor their ecological status and processes, which is the underlying scientific goal of this project. It brings together academic and industry partners in five countries to learn and get familiar with different research and business traditions, cultural aspects and skills requirements.

ESAIL “Electric sail propulsion technology” under Space theme is coordinated by Finnish Meteorological Institute. Tartu Observatory is one of the eight partners in that project. The technology itself is a recent invention of ultra-efficient propellantless in-space propulsion technology. The E-sail concept is an enabling technology for reducing significantly the time, cost and mass required for spacecraft to reach their destinations. In this project, the key E-sail technologies will be developed to prototype level. The goal is that after the project, the decision to build and fly the first E-sail demonstration mission in the solar wind can be made. For Tartu Observatory team this project is mutually linked with national satellite EstCube-1, that is carrying first component of E-sail to the space for tests.

CosmoTar “Developing a Centre of Interdisciplinary Research of Cosmology at Tartu Observatory” proposal under FP7 Capacity was submitted to establish a modern centre of excellence in cosmology across Northern and Eastern Europe at Tartu Observatory. The project stays on solid bases of the Estonian cosmological research supplementing the existing competence on the large-scale structure of the Universe and galaxy physics with modern data acquisition methods and the latest developments in the field of astroparticle physics. Close network of four partnering institutions is planned within that project.

Tartu Observatory participates in two more international projects that support Global Monitoring for Environment and Security programme (GMES) as end-user. These are **DORIS_Net “Downstream observatory organised by Regions active in Space”** and **Freshmon “High Resolution Freshwater Monitoring”**.

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Through the dissemination processes, the know-how and expertise of Tartu Observatory scientists and researchers reached to the Estonian public, policymakers and representatives of industry, including SMEs, who have been invited to all the seminars and conferences, organised by EstSpaceE team, but also as partners in new applications. Special attempts were made to increase awareness of the space matters and activities to a wider public, by distributing information materials, managing a website and **organizing specific events**:

- (1) **medium scale international conference “Space Downstream Services 2010 - Boosting the Competitiveness of Business and Science: Satellite Services in Modern Society”** took place in Tallinn, Estonia;
- (2) **industry and enterprise targeted workshop “How to do Business in Space Sector”** was organized in Riga, Latvia;
- (3) Advisory Council meeting together with EstSpaceE **workshop “Modern Trends in Space Research 2011”** was held in Tartu, Estonia.

During the third project period researchers participated on 9 international conferences and seminars, 26 networking visits were organized and 13 recruited or seconded researchers with complementary competence were working in TO.



Joint Panel Discussion *Space Services & Opportunities of the Future* at the Space Downstream Services Conference on May 6th 2010 in Tallinn, Estonia. (From left: Carsten Brockmann (Brockmann Consult, Germany), Anu Reinart (Tartu Observatory, Estonia), Mikko Strahlendorff (GMES Bureau, Belgium), Josef Aschbacher (ESA, Italy), Göran Boberg (SNSB, Sweden), Ene Ergma (President of the Estonian Parliament, Estonia), Alar Kolk (Ministry of Finance, Estonia).