

SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
In Orbit - Postgraduate Space Education (4)

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MASTERS PROGRAMS IN SPACE SCIENCE AND ENGINEERING IN NORTHERN SWEDEN

Abstract

This review discusses the development of the masters programs in space science and engineering at Luleå University of Technology (LTU) in Northern Sweden during the last decade. The space education at Luleå University of Technology started in 1997 with a national Master Program in Space Engineering. This five years program takes place at Luleå campus during the first 2 years. The second half of the program, i.e. 2 years, is given at Kiruna Space Campus.

In 2005 a new joint two years Erasmus Mundus Master Program in Space Science and Technology - SpaceMaster was started as a consortium of six European universities from Czech Republic, Germany, Finland, France, Sweden and UK. Luleå University of Technology is program coordinator. Since 2010, the SpaceMaster consortium expanded with the American and Japanese universities as well as the External Advisory Board with representative from the space industry and research organizations.

The international Master Program in Spacecraft Design and Master Program in Earth Atmosphere and the Solar System are offered since 2012. The Master Programme in Spacecraft Design aims to design a spacecraft in a computer environment by a concurrent engineering method and in combination with hands-on experience in instrument building. The Master Program in Earth Atmosphere and the Solar System leads students with the engineering background to an understanding of the atmospheric and space environments as well as deepens the specific knowledge for students with the scientific background.

The review examines conditions and challenges in setting up and running the programs in the following areas:

- choice of themes for the modules;
- student recruitment;
- utilization of pedagogical methods and learning outcomes;
- hands-on learning through the active participation in the international student balloon and rocket projects BEXUS-REXUS that are realized under a bilateral agency agreement between the German

Aerospace Center (DLR) and the Swedish National Space Board (SNSB), and the student rocket project SERA, part of the PERSEUS programme that is piloted by CNES in partnership with other organizations;

- complementarity between formal, informal and non-formal learning;
- internal and external collaboration with the space oriented organizations, agencies and companies.

A special attention is devoted to the collaboration with the local partners, i.e. Esrange Space Center of SSC, Swedish Institute of Space Physics and EISCAT Scientific Association. The review highlights the importance of multicultural awareness and stronger focus on EU added values when working with the international educational programs.