

SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)  
On Track - Undergraduate And Postgraduate Space Education (2)

Author: Mr. Arne Hjalmar Hansen  
Norwegian Centre for Space-Related Education (NAROM), Norway, arne-hjalmar@rocketrange.no

Mr. Jøran Grande  
Norwegian Centre for Space-Related Education (NAROM), Norway, joran@narom.no

Mr. Torstein Wang  
Norwegian Centre for Space-Related Education (NAROM), Norway, torstein@rocketrange.no

SPACE-RELATED HANDS-ON EDUCATION IN NORWAY

**Abstract**

NAROM (Norwegian Centre for Space-related Education) offers educational programmes for teachers and students at many different levels to promote appreciation for the benefits of space activities, to facilitate recruitment in the space industry, and to stimulate an interest in science in general. NAROM is co-located with Andøya Rocket Range (ARR). The close proximity to the facilities and personnel at ARR provides important advantages with respect to educational activities, and NAROM uses the unique technical facilities at ARR to provide an exciting educational experience.

NAROM co-operates with universities and educational institutions nationally and internationally. The education program at NAROM span from compulsory primary and secondary school to graduate university students.

European Space Camp is an annual event at ARR for students between the ages of 17 to 20, and so far students from over 20 countries across the world have participated. The students learn to build and launch their own instruments onboard a student rocket. Topics like trajectory analysis, introduction to rockets, payload integration and telemetry are covered. The main focus is the preparation of the student rocket where the students build the instruments, perform the rocket launch operation, tracking the rocket and analyzing data from the rocket. The highlight is of course the rocket launch which takes place near the end of the week.

In 2010 NAROM hosted a European CanSat competition in collaboration with ESA. Teams consisting of high school students (aged 16+) from ten different ESA Member States competed in building the best miniature satellite payload. Each payload were placed inside of a soda can that were launched to an altitude of one kilometer by the use of a rocket. The CanSats performs its mission and transmits telemetry back to a ground station while descending. NAROM is now planning an International CanSat Competition with launch of ten CanSats from Andøya in May 2012.

NAROM host an International Summer School for Master and PhD students about unmanned aerial systems with a technical approach at ARR. The summer school is a part of the scientific project Arctic Earth Observation and Surveillance Technologies. The course consists of theoretical lectures and practical operation of UAS and data analysis. Top scientists within their area give lectures within UAS technology. The main focus is to plan a real UAS operation, build your own payload, integration within the UAS payload section, UAS operation and data handling and analysis.