

SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
SPACE WORKFORCE DEVELOPEMENT – CHALLENGES AND OPPORTUNITIES (7)

Author: Dr. Roger Walker
European Space Agency (ESA), The Netherlands

Mr. Piero Galeone
European Space Agency (ESA), The Netherlands

Mrs. Helen Page
European Space Agency (ESA), The Netherlands

Mr. Antonio Castro
European Space Agency (ESA), The Netherlands

Mr. Francesco Emma
European Space Agency (ESA), The Netherlands

Dr. Natacha Callens
European Space Agency (ESA), Spain

Dr. Javier Ventura-Traveset
European Space Agency (ESA), Spain

ATTRACTING AND TRAINING THE NEXT GENERATION OF EUROPEAN SPACE ENGINEERS
THROUGH HANDS-ON SPACE PROJECT ACTIVITIES

Abstract

The ESA Education Office was established in 1998 with the purpose of motivating young people to study Science, Engineering and Technology subjects and ensuring a qualified workforce for ESA and the European space sector in the future. In achieving this, the ESA Education Office provides numerous opportunities for university students from ESA Member and Cooperating States to gain practical hands-on experience on real space projects. These opportunities cover a broad spectrum of flight project activities ranging from student experiment payloads on microgravity platforms, atmospheric balloons, and sub-orbital sounding rockets to instruments and small platforms for Earth and Moon orbiting satellites. The education satellite projects range in size from pico-satellites to mini-satellites and are complemented by a global network of education institution and radio amateur ground stations.

By participating in these projects, students gain the technical/programmatic knowledge and practical skills necessary for entering into the space engineering workforce, and immediately making a solid contribution to the European space programme, thus underpinning and building upon European capabilities in the space domain. The product of these projects is a set of qualified, fully trained engineers covering not only specialist technical disciplines in space engineering, such as structural, thermal, avionics, instrument, propulsion, and ground segment, but also systems engineers capable of developing complete satellites from end to end.

Since ESA hands-on space project activities began in the mid-1990's with the first student parabolic flight campaign, through the completion of three student satellite projects, to the present day activities, it is estimated that over 3,600 students distributed over 22 ESA Member and Cooperating States have benefited. In implementing the programme, the ESA Education Office works closely with a wide network of engineering faculties in universities across Europe, with space industry companies and with ESA technical experts to ensure that supervision, seniority guidance, mentoring and knowledge transfer is provided to the participating students by experienced professionals. In this context, ESA Education Office, with

its partners, also provides the necessary collaboration tools, software, facilities, independent technical reviews, workshops, and internships sponsorship to enable an effective working environment. Launch opportunities are also provided in order to actually fly the student-built systems.

This paper will describe the hands-on space education programme strategy and its implementation, the engineering education methods, and the knowledge/skills transferred to the students, in addition to summary technical information on the projects concerned.