

IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)  
Lift Off - Secondary Space Education (2)

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## ACCESS TO SPACE FOR STEM EDUCATION VIA ICE CUBES

**Abstract**

Space is considered as the ultimate summum of inspiration for topics in Science, Technology, Engineering and Mathematics (STEM) education. The International Space Station (ISS) is one of the most powerful and inspiring scientific laboratories, placed in one of the most unique and least explored environments around our Earth and covering the widest range of research disciplines under one roof.

This is a huge attraction for both scientists and educators, but unfortunately the use of the ISS has been in the past unattractive for a large number of potential users due to the burden of complex rules, procedures, cost and duration associated with developing, certifying and operating equipment on board. Recently the International Commercial Experiment Cubes (ICE Cubes) service has been established as first such service in Europe to provide now fast, simple and affordable access to the ISS under a public/private partnership with the European Space Agency.

The educational programme of the ICE Cubes service seeks to emphasise and encourage interest and further study in STEM related subjects and will initially target school students ranging from primary to secondary level. Furthermore, we aim to stimulate the curiosity of hundreds of teenagers in activities outside school hours, involving summer schools, science camps, science museums and centres, by offering support in exploiting an absolutely unique way to experience the excitement and inspiration of performing scientific experiments in space.

Educational Cubes containing some flagship educational scientific experiments will be designed and launched. Associated dedicated learning, teaching and outreach material will be developed, compatible with existing educational curriculum programmes in Europe and related languages. Through an online platform, schools, teachers, other institutions and children will be able to access the material. After having gone through the material, the student will be able to run the experiments on-board the ISS in real-time from their own classroom by sending simple or more complex commands. The experiment scientific data will also be received in real-time allowing students to immediately compare the results obtained in space and on ground.

The educational ICE Cubes programme will also target to connect the ‘knowledge triangle’ of business, education and research in space-related areas. By involving industry, academia and “NewSpace” representatives, the true and realistic aspects of human spaceflight will be brought to the classroom.

This paper will present the development of the educational wing of the ICE Cubes Service and the expected impact as motivation trigger for STEM education.