NAASCube program, an innovative aerospace program for students, driven by the Nouvelle Aquitaine Academic Space Center

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Abstract
In 2019, the Nouvelle-Aquitaine Academic Space Center (NAASC) was created to foster innovation by involving students from various higher education institutions in collaborative aerospace projects. Different programs concerning Access to Outer Space were identified that drive them in a dynamic and intergenerational way, with the support of aerospace companies and institutions.

One of these programs, named NAASCube, is related to the development of a nanosatellite with students. It is innovative for several reasons.

First, it is a collaborative program between institutions from geographically remote areas, providing different trainings with different timings and duration. In this context, more than 30 students are involved each year in the CubeSat program, all focussing on the same topic. Some of them are designing the scientific and technological payloads of the nanosatellite, while others are working on the platform, dealing with system aspects and software. Others are designing ground-based testing equipment for vibratory and thermal analysis, for instance, before launching the nanosatellite. The remaining ones are preparing the operational phase, working on the ground segment and telecommunications. Coordination of the program is secured by regular teleconferences, face-to-face meetings and a shared digital working environment for communication and documentation.

Furthermore, the NAASCube program focuses on project management. Students must organize their teams with project managers, subsystem leaders, tasks monitoring… It is supported by the CNES Nanolab-Academy project, which provides collaborative tools for orbits and attitude simulations. Students are compelled to follow CNES CubeSats Standards, and to prepare each end of phase review in a professional manner. Very enlightening!

Concerning the payloads of the nanosatellite, students are encouraged to find collaborations with research laboratories or companies. Two payloads are presently based on lab research: one for IoT (Internet of Things) demonstration and the other one for physics purposes. The two

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other payloads result from collaborations with companies, either major industrial groups or startup created by students. All these initiatives are real opportunities for students to gain valuable work experiences in the aerospace field.

In conclusion, the NAASCube program is an example of the way an Academic Space Center can develop aerospace skills, know-how and innovation through the training of students from very different backgrounds. The final aim of the NAASC is to bring together the Nouvelle Aquitaine Region, academics, CNES and companies with a common objective of launching a first nanosatellite in 2025. And, in longer-term, the goal is to build an aerospace competence center for new industrial, societal, and environmental applications.

Keywords
NAASC, nanosatellite, education, CNES NanoLab Academy