

SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
“Hands-On” Space Education (1)

Author: Ms. Amandine Denis
University of Liege, Belgium, Amandine.Denis@ulg.ac.be

Mr. Jonathan Pisane
University of Liege, Belgium, jpisane@ulg.ac.be

OUFTI-1, THE EDUCATIVE NANOSATELLITE OF THE UNIVERSITY OF LIEGE, BELGIUM.

Abstract

OUFTI-1 is the first CubeSat developed at the University of Liège, as well as the first nanosatellite ever developed in Belgium. It is being developed within the framework of a long-term, educative program, the goal of which is to develop a series of student satellites for scientific experiments. The main objective is to provide the appropriate environment to allow students to acquire hands-on experience, to learn to work as a team, and to manage projects.

The key, innovative feature of OUFTI-1 is the use of the recently-developed ham-radio communication protocol D-STAR. The overall D-STAR system provides a lot of new built-in features including digital communication, simultaneous voice and data transmission (e.g. GPS data), complete routing over the internet, and callsign-based roaming on a worldwide basis. OUFTI-1 will be the first satellite to test D-STAR communications in space. Another experiment that will fly aboard OUFTI-1 is an innovative digital electrical power system developed in partnership with Thales Alenia Space ETCA. OUFTI-1 will also test high-efficiency solar cells provided by AzurSpace.

The overall OUFTI-1 system is organized in different subsystems, each of them performing a main functionality: electrical power supply, on-board computer, structure, mechanisms, thermal, mission analysis, ground segment, communication, and attitude control. Thirteen students are, in the frame of their MS thesis, responsible for the achievement of a subsystem. They come from different engineering fields (aerospace, mechanics, computer and electrical engineering) of two departments of the University and two engineering schools of Liege. Students are advised in their choices and tasks by an “advisory board” composed of professors and specialists from the industry. They can also take full advantage of the significant expertise and experience available in Liège in the space arena. The entire, highly multidisciplinary team is managed by two PhD students from the involved departments.

OUFTI-1 is one of the nine CubeSats selected by the European Space Agency to take part in the VEGA maiden flight. This new launcher is scheduled to lift off in November 2009. This makes the schedule very challenging. However, the motivated students benefit from a strong academic and industrial support. Thus, OUFTI-1 will demonstrate an innovative communication system, which will also be at the heart of future space experiments. Above all, OUFTI-1 will provide students with a unique, exciting, and enriching experience.