

43rd STUDENT CONFERENCE (E2)
Student Team Competition (3-V.4)

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3U CUBESAT FOR CANADIAN SATELLITE DESIGN CHALLENGE: A POLYTECHNIQUE
MONTREAL AND UNIVERSITY OF BOLOGNA COOPERATION**Abstract**

The mission proposed stems from an international collaboration between Polytechnique Montreal and the University of Bologna, partners in the second edition of the Canadian Satellite Design Challenge. This collaboration gives both teams a great opportunity to learn the basics of international team work and to experience different cultures. To pursue this goal, the team is structured as we would see in commercial missions; a customer and a contractor. The customer is Polytechnique Montreal, who will design the satellite's structure and subsystems. University of Bologna will act as a contractor and will develop the primary payload. The teams will work in their respective country and scheduled meetings will occur regularly. This project will require an intensive organizational program for its success. This represents an important educational aspect that both teams will retain. The mission consists of a 3U cubesat, whose primary payload is a deorbiting system based on an innovative drag sail. The target of this payload is to test the deployment of the sail and evaluate its performances in terms of orbit lifetime reduction. The system is designed to be plugplay with the cubesat in order to make its integration easy

and affordable. Moreover, the system will be functional in the case of satellite failure. The secondary payload entails an image capturing system for Earth observation. This system will provide images of the Canadian Arctic region for research of the Geocryolab (Laboratory of Geotechnics and Geomorphology of Cold Regions) of the University of Montreal, in order to study the periglacial landforms. As mentioned, the University of Bologna team is responsible for the development of the deorbiting system, while the Polytechnique Montreal team will provide the image capturing system and the satellite's subsystems. Among these subsystems is the satellite's structure, which will be designed, by a student of Polytechnique Montreal, to not only support this mission's systems, but also to be modifiable for multiple Nano satellite configurations. The project also has the objective to transmit interest for space engineering, satellites and international cooperation throughout our community. This will be achieved with strong outreach to present our project and encountered problems and the way they were solved.