

41st STUDENT CONFERENCE (E2)  
Student Team Competition (3)

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CU3SAT: A CANADIAN STUDENT NANOSAT FOR SCIENTIFIC AND TECHNOLOGY  
DEMONSTRATION**Abstract**

CU3SAT is Carleton University's entry into the Canadian Satellite Design Challenge organized by Geocentrix Technologies Inc. A team of 10 undergraduate and graduate students is engaged in designing the nanosat for scientific and technological demonstrations. The primary scientific demonstration is an experiment in early coronal mass ejection (CME) detection which will be instrumental in protecting power grids across the globe during the solar events. CMEs are difficult to detect until they are within imminent contact of Earth. By observing how CMEs interact with background cosmic radiation, it is possible to detect them up to three days in advance. Future CME detection could then be realized through a low-cost network of cubesats. A secondary technology demonstration is an experiment to show the feasibility of power beaming between spacecraft. On-orbit servicing has the potential to utilize low-cost small spacecraft to revitalize higher-cost spacecraft. One such method of on-orbit servicing is to beam power from one spacecraft to another in order to charge batteries to reinitialize primary functions. Another application to power beaming is orbital power generating stations. Highly intensity light beams can be transmitted from one source to another over great distances. CU3SAT will demonstrate power beaming using its own power source and transmitting it to a receiver.