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SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
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STUDENT-LED OUTREACH THROUGH A UNIVERSITY NANOSATELLITE

Abstract

While university nanosatellite missions can serve to teach space systems to undergraduate and graduate students, the activities can also serve to inform and inspire the next generation of space explorers. The excitement, passion, and curiosity from the university students helps make space accessible to pre-university students. The University of Manitoba (UofM) Space Applications and Technology Society (UMSATS) student group designing the T-Sat1 nanosatellite embraced this approach for space outreach and help reach more than 3,900 people in the first two years.

The UMSATS outreach activities are divided into five categories with increasing levels of engagement: (i) seminars, (ii) presentations, (iii) collaborations, (iv) demonstrations, (v) workshops, and (vi) space camps. At the lowest level, invited expert guest speakers were invited to share their work and research. These activities help link the T-Sat1 project to many other national initiatives. The presentations are focus on T-Sat1 and are customized for different audiences including pre-university students, university students, industry, and special interest groups. Younger audiences are engaged through references to popular culture and games as a means of dissipating knowledge, while the academic and industry presentations contained technical content presented in a formal manner. In order to maximize the impact of the activities, UMSATS partnered with many groups to lead workshops and judge student design competitions. These collaborations help connect many pre-university students, thus encouraging them to get more involved. Laboratory demonstrations made the concepts come to life for young audiences. These included voice contacts through amateur satellites using the UofM Satellite Ground Station and visits to see the assembly of the nanosatellite. The hands-on workshops for high school students and teachers focused on programming sensors for space using Arduino-UNOs and various sensors. Participants were guided through the circuit implementation, programming of the microcontroller, and testing of their circuit. One high school has since applied these concepts into the electronics for a high altitude weather balloon as a means of expanding the possibilities for high school science activities in near-space. Finally, the team participated and led workshops at space camps such as the Manitoba Space Adventure Camp.

This paper presents the outreach activities of the T-Sat1 team including lessons learned from presenting to pre-university audiences, activities used to engage audiences in the presentations, and experience from interactive hands-on workshops. The benefits and motivation for university students is also discussed as a means to expand the educational experience while also promoting space exploration.