

Project Management Structure of a Fully Student Designed Cube-Satellite

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ABSTRACT

The RADSAT-SK CubeSat project is a joint venture between The University of Saskatchewan, Saskatchewan Polytechnic, and the University of Saskatchewan Space Design Team. Funded in part by the Canadian Space Agency through the Canadian CubeSat Project, the RADSAT-SK satellite aims to fulfill research and educational objectives. The RADSAT-SK satellite carries three payloads on board. The first is a remote sensing optical payload which will capture grayscale images of the Earth to be used for outreach purposes stemming from the project. The second payload uses a novel method for monitoring the total dosage of radiation the satellite experiences using floating gate MOSFET devices. Lastly, the third payload is a novel method of blocking radiation by covering electronic components in compounds containing high concentrations of the amino-acid melanin.

From the inception of the project, the RADSAT-SK project has been unique in that it is the only fully-student designed CubeSat in Canada, aside from faculty oversight regarding project finances and advice on management. The team currently consists of one faculty supervisor serving as the project's principal investigator, and approximately 70 students, over 90% of whom are undergraduates. This unique team composition has led to the development of a project management structure in which students (largely undergraduates) are responsible for all aspects of the project. This structure has proven to be successful for RADSAT-SK, however the lack of experienced graduate students or extra faculty supervisors does pose a risk to project success as team member turnover is high, and undergraduate students are often not knowledgeable about the complexities relating to space mission designs.

To mitigate this risk, the RADSAT-SK team has chosen a leadership structure where three project managers (technology, finance, HR/outreach) oversee seven team-leads who each individually manage one subsystem of the satellite. This structure has proven to have two benefits. The first is that executive members can remain focused on one specific subsystem which prevents burnout, and second, in the event of a sudden member departure, extensive knowledge about the satellite is not lost. Furthermore, the team has become effective at managing student turnover such that knowledge about the design of the satellite is not lost when members graduate or leave the team. Extensive documentation, as well as team leads and project managers being able to choose their successors, has resulted in minimal loss of knowledge and smooth transitions for incoming executive members.

RADSAT-SK sincerely thanks its project donors for their generosity.