

Dear sponsor of the Baker Hughes Indigenous Scholarship,

I've just received a bursary through Indspire that was made possible through your generous support. I'd like to extend my appreciation towards your effort to fund ingenious students in their pursuit of education, and to provide a bit of background for who you've sponsored. First, thank you! This award has made a positive impact on the financial situation of me and my wife, we're incredibly grateful.

I'm a second-year master's student in experimental astro-particle physics at the University of Alberta (U of A), studying nuclear recoils; a process that describes how a particle scatters off nuclei without electromagnetic interactions. My research is in collaboration with PICO, an international group pushing the limit for direct detection of dark matter (non-luminous weakly interacting mass predicted to exist based on mounting evidence from observational astronomy). The goal of my research is the careful reconstruction of events measured by PICO to further understand the detectors response to radiation. This analysis will question the limits of the technology, while improving the model of neutron backgrounds for future dark matter experiments. The detector involves a bubble chamber filled with moderately superheated C_3F_8 . This liquid transitions to a gas (bubble formation) when small amounts of energy are deposited from incoming radiation. I work on commissioning the thermal and camera systems for the new PICO 40L detector, located 2 km underground at the SNOLAB ultra-clean research facility in Sudbury, Ontario. For reference, I've included sample images of the construction in a thank you picture.

My career goal is to apply my background in radiation and space plasma physics to the satellite industry. This stems from my undergraduate experience at the U of A, where I worked with the AlbertaSat project for about three years. These students are responsible for putting Alberta's first satellite into orbit (Ex-Alta 1) and now work on its predecessor (Ex-Alta 2). I contributed to the group by developing an open source UHF communications board for cube satellites, and I worked as the Communication Team Lead where I established the foundation for a successful mission; trade study of satellite components, power-link-data budgets, and coordinated with Natural Resources Canada to provide a ground station network for future missions. These experiences motivate me to question radiation safety for astronauts and equipment in the proposed large-scale space missions of the CSA and NASA. To reach this goal I'm considering getting a second degree in electrical engineering after my current master's research in radiation, or to directly apply my skills to the job market.

In receiving this award, my financial uncertainty in the coming months/year has been greatly reduced as I approach the question of continued education or industry. This sponsorship allows me to make a clear decision moving forward that focuses on my passion and career goals, instead of simply making ends meet.

As a Métis student your generous support is greatly appreciated.

Thank you once again,

Clayton B. Coutu