

# Canadian Astro-Particle Physics Summer Student Talk Competition

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## MATHUSLA

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MATHUSLA is a Long Lived Particle detector that will start functioning in 2025. It will be placed at the (LHC) Large Hadron Collider at CERN. The detection of Long Lived Particles requires precise triggering and background setting, therefore allowing the MATHUSLA detector to tune these settings as opposed to LHC, where it is impossible to detect such particles. The result of the MATHUSLA experiment will help us research and detect particles that are lifetime stretches up to Big Bang Nucleosynthesis.

The experiment at the University of Toronto lab focused on testing wavelength shifting fibers (WLSFs) with Silicon Photo-multipliers (SIPMs). Silicon Photo-multipliers, electric pulses, scintillating bars, and an oscilloscope were used in the testing of the fibers. Our work consisted of measuring the time and energy delay and the attenuation of the fibers, thus allowing us to use the cosmic ray setup to detect cosmic rays with the best fiber chosen. The result of the experiment will help the team at the University of Toronto to build a small model of the MATHUSLA detector

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