

SEMINAR NOTICE

Department of Physics and Engineering Physics
University of Saskatchewan

SPEAKER: Paarangat Pushkarna, PhD Student
Accelerator Physics, University of Melbourne

TOPIC: *Our guiding (Cherenkov) light: monitoring particle beams with Cherenkov Radiation*

DATE: Tuesday September 8th, 2026

TIME: 3:30-4:30 p.m.

Beam diagnostics are vital for the successful operation of particle accelerators. Diagnostic tools measuring the charge, duration, and size of particle bunches coasting through accelerators are essential feedback mechanisms for machine optimisation. As accelerators push toward new performance frontiers, the diagnostics that monitor them must keep pace. In this context, the seminar overviews Cherenkov radiation (ChR) in optical fibers as a means of detecting and measuring charged particle beams. It focuses on ChR generated by high energy electrons impinging on silica optical fibers. As ChR intensity is proportional to incident charge, variations in bunch charge over time are reflected in variations in ChR intensity. The seminar discusses how to resolve these temporal variations in ChR intensity at picosecond timescales, in order to infer bunch structure. As the picosecond regime is challenging for common off-the-shelf digitisers, the streak camera will be introduced as an alternative detector. The most recent attempts at resolving bunch structure will be shown, concluding with an outlook to future measurements and opportunities.