



# PHYSICS AND ASTRONOMY COLLOQUIUM

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TRIUMF

## **Probing Physics Beyond the Standard Model at T2K and Hyper-K**

### Abstract

“The discovery of neutrino oscillations by the Super-K and SNO+ experiments provided evidence for new physics beyond the Standard Model in order to generate neutrino masses. Neutrino oscillations along with the astrophysical evidence for dark matter, theoretically motivated extensions of the Standard Model and efforts to unify the fundamental fields all motivate continued searches for physics beyond the Standard Model and experiments that are sensitive to potential signatures of new physics. Neutrino observatories and the associated long baseline neutrino experiments play a key role in these searches. The T2K long baseline neutrino oscillation experiment established the muon neutrino to electron neutrino oscillation channel in 2014, and has since studied neutrinos and antineutrinos to search for evidence of CP violation in neutrino oscillations. Beyond T2K, the recently approved Hyper-K experiment will provide up to 20 times the statistical power to search for CP violation compared to T2K, and will be sensitive to other processes such as proton decay, dark matter annihilation and supernova neutrino detection. In this talk, I will cover recent results from T2K on the measurement of neutrino oscillation parameters, including the parameter governing CP violation. I will also introduce the Hyper-K experiment and discuss the challenges and efforts on photon detection, data analysis and systematic error reduction that will be necessary to maximize the sensitivity of Hyper-K. These include a Canadian led effort to build a new kiloton-scale water Cherenkov detector called the Intermediate Water Cherenkov Detector (IWCD), that will probe neutrino interactions in a novel manner.”

Wednesday, September 16, 2020

3:30 p.m.

via Zoom: <https://uvic.zoom.us/j/99605059029>