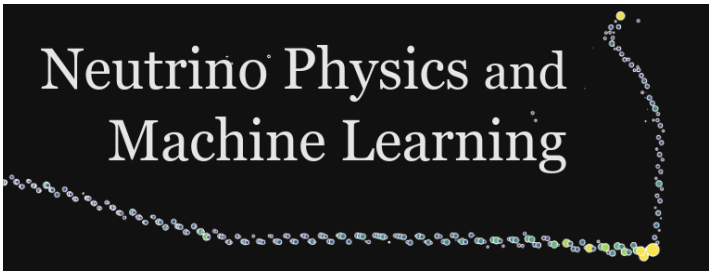

Contribution ID: **18** Type: **A collaboration/project summary talk**

Machine Learning Techniques in Event Reconstruction and Classification for Cyclotron Radiation Emission Spectroscopy Signals in Project 8

Tuesday, 14 July 2020 14:05 (40 minutes)

Project 8 is developing Cyclotron Radiation Emission Spectroscopy (CRES) on the beta-decay spectrum of tritium for the measurement of the absolute neutrino mass scale. CRES is a frequency-based technique that aims to probe the endpoint in the tritium energy spectrum with a final sensitivity of 0.04 eV. Current studies are performed on monoenergetic electrons from a gaseous \textsuperscript{83\textit{m}}Kr calibration source and beta-decay electrons from molecular tritium; the first ever CRES tritium spectrum was recently obtained and presented at Neutrino2020. We discuss the event reconstruction process which leads us from frequency measurements to an energy spectrum with special focus on the machine learning techniques developed to classify (Support Vector Machine) and reconstruct (Convolutional Neural Network) CRES signals with strong precision and accuracy.

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Session Classification: Day 2 Afternoon