UNBC UNIVERSITY OF NORTHERN BRITISH COLUMBIA

Department of Physics Seminar

Searching for new physics in high precision measurements of the weak charges of the proton and the electron

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Abstract:

Our understanding of nature at its most fundamental level is currently provided by the so-called Standard Model (SM) which describes the elementary particles of nature, their properties, and their interactions. This great achievement of 20^{th} century physics has been immensely successful at explaining a wide range of physical phenomena from the smallest scale (subatomic) to the largest (the whole universe). However, the SM has some serious shortcomings and it is widely believed that it is only part of a larger model containing potentially new particles and new interactions yet to be discovered.

In this talk, I will give a brief introduction to the SM, explain why searches for new physics beyond the SM are needed, and outline how these searches are done. I will then describe in some detail two experimental projects, one completed and one ongoing, aimed at testing SM predictions and looking for new physics. These experiments, done at the Jefferson Laboratory in Newport News, VA, USA, involve high precision studies of parity-violating electron-proton and electron-electron elastic scattering which serve to measure the so-called weak charges of the proton and the electron. Results and implications from the completed project will be shown and discussed.

+ Date

Friday
March 13, 2020

+ Time

4:00 – 5:30 P.M.

+ Location

10-4588 - Teaching & Learning Building

+ Contact

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Everyone welcome
Light refreshments served