American University of Beirut

Physics Department

Invites you to a talk entitled

Search for rare B meson decays at the BaBar experiment

By

Dr. Racha Cheaib

Postdoctoral Fellow
Department of Physics
University of Mississippi
USA

Abstract

The current understanding of the basic constituents of matter in our universe is embedded in the Standard Model (SM). This model has succeeded as a low energy effective theory. Yet, even with its high level of consistency with experimental measurements, many questions are left unanswered. This motivates the ongiong hunt for new physics. In this talk, I present the search for rare B meson decays, specifically flavour-changing neutral current (FCNC) processes. FCNC processes, such as $B \to K^{(*)}\ell^+\ell^-$ where $\ell = e^+, \mu^+, \tau^+$ or ν, are highly suppressed in the Standard Model (SM), with a branching fraction ranging between 10^{-5} and 10^{-7}. These rare decays are forbidden at tree level and can only occur at lowest order via 1-loop diagrams. $B \to K^{(*)}\ell^+\ell^-$ thus provides a stringent test of the SM and a fertile ground for new physics searches. The *BABAR* experiment at the SLAC National Accelerator Laboratory has completed its data taking, with 424 fb^{-1} collected at the $\Upsilon(4S)$ resonance. Using data from the *BABAR* experiment, I present the latest results on the search for $B \to K^{(*)}\ell^+\ell^-$, where $\ell = e^+$, μ^+ or ν. Furthermore, the first search for $B^+ \to K^+ \tau^+\tau^-$ is presented.

Date: Wednesday, July 26, 2017
Time: 12:00 p.m.
Place: Emile Bustani for Physics, Rm. 333