



# LHC Seminar

SPEAKER: Brian Hamilton (University of Maryland (US))  
TITLE: **Measurement of the semitauonic decay  $B^0 \rightarrow D^{*-} \tau^+ \nu$  at LHCb**  
DATE: Tue 30/06/2015 11:00  
PLACE: Filtration Plant

## ABSTRACT

Semileptonic  $b$  decays to tau leptons provide a powerful probe for violations of charged lepton universality due to physics beyond the standard model. In particular, new particles with Higgs-like enhanced couplings to the third generation fermions may induce large deviations from the well-understood standard model expectations. The decay rates for these processes remain poorly measured compared to the corresponding processes involving the light leptons, and tantalizing but inconclusive hints of a deviation from the Standard Model have been reported. A new measurement of the ratio of branching fractions  $R(D^*) = \mathcal{B}(B^0 \rightarrow D^{*-} \tau^+ \nu) / \mathcal{B}(B^0 \rightarrow D^{*-} \mu^+ \nu)$  using the LHCb Run 1 dataset is presented, where the tau is selected in the  $\tau^+ \rightarrow \mu^+ \nu \bar{\nu}$  decay mode. This is the first measurement of a  $b \rightarrow X \tau \nu$  process at a hadron collider.