

# Department of Physics

Particle Physics  
The Denys Wilkinson Building, Keble Road, Oxford OX1 3RH



## Experimental Particle Physics Seminar

at 2.15 pm

Dennis Sciama Lecture Theatre

Tuesday 30<sup>th</sup> April 2019

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### Search for lepton flavour universality violation in $B^+ \rightarrow K^+ \ell^+ \ell^-$ decays at LHCb

#### Abstract

Recent measurements of observables involving the flavour changing neutral current transition  $b \rightarrow s \mu^+ \mu^-$  have shown an interesting pattern of tensions with respect to the predictions of the Standard Model (SM). However, the interpretation of these results is limited by our present understanding of the hadronic uncertainties affecting these predictions. Given the lepton-flavour-universal nature of the SM, observables such as  $R_K = \text{BR}(B^+ \rightarrow K^+ \mu^+ \mu^-) / \text{BR}(B^+ \rightarrow K^+ e^+ e^-)$ , so-called Lepton Flavour Universality ratios, profit from large cancellation of the theory uncertainties and provide a very sensitive probe for physics beyond the SM.

The previous measurement of the ratio  $R_K$  performed by the LHCb collaboration, using Run 1 data, found a value compatible with the SM expectation at the  $2.6\sigma$  level. In this seminar, a new measurement of  $R_K$  at the LHCb experiment will be presented. The new measurement reanalyses the data recorded by LHCb during Run 1, and adds data collected during 2015 and 2016. The total dataset is double the size of that previously analysed.