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

UNIVERSITY OF OXFORD

Experimental Particle Physics Seminar

at 2.15 pm
https://cern.zoom.us/j/69856157536?pwd=MjNPZFh5SERsYi9WYmtENnJCdGtaQT09

Tuesday 11 May 2021

Meet our Postdocs
University of Oxford

Dr Alex Gilman
Recent results on leptonic and semileptonic D_{s}^{+} decays
Abstract
Leptonic and semileptonic decays of charmed hadrons provide unique tests of our theories of electroweak and strong interactions. In this talk, I'll present two recent results from the BESIII experiment relating to (semi)leptonic decays of D_{s}^{+} mesons: an analysis of D_{s}^{+} decaying to pure leptonic final states, and an analysis of inclusive semielectronic D_{s}^{+} decays. The first analysis provides the world's most precise single measurements of both the pure tauonic and muonic branching fractions of the D_{s}^{+}. These, in turn, provide precise determinations of the D_{s}^{+} decay constant, the |V_{cs}| CKM element, and a charm-sector lepton-universality test. The second analysis measures the inclusive semielectronic D_{s}^{+} branching fraction, sets an upper limit on the unobserved D_{s}^{+} semielectronic branching fraction, and provides a testing ground for techniques of extracting CKM elements from inclusive semileptonic meson decays.

Dr Daniel Cervenkov
Model-independent D0 -> 4h & LHCb PID Calibration
Abstract
Recent years have seen a renaissance of charm physics fueled by a range of new results. D meson mixing is now well-established, and CP violation in the charm system was observed in 2019. Experimental studies of charm mixing are sensitive to two parameters, $x = \Delta M/\Gamma$ and $y = \Delta\Gamma/2\Gamma$. Measurements show $y \approx 1\%$, clearly establishing a non-vanishing neutral charm decay width difference, and it is assumed x is of similar magnitude. However, the measurements of x are so far still consistent with zero.

Particle identification (PID) is a crucial ingredient of the LHCb physics programme. It combines information from many sub-detector systems to distinguish final state particles. LHCb analyses currently use a PID calibration framework that limits the dimensionality of the PID efficiency binning. As the datasets of Run 3 will be much larger than before, we must control the systematic

uncertainties to a better degree. This will require a higher-dimensional binning than the current approach allows.