

**Summer Institute 2019:
Flavour anomalies in B decays,
light dark matter from hidden
sectors and lepton dipole
moments**

Report of Contributions

Contribution ID: 1

Type: **not specified**

Model independent analysis of MeV scale dark matter

Monday, 24 June 2019 11:00 (1 hour)

Recent results from several direct detection experiments have imposed severe constraints on the multi-GeV mass window for various dark matter (DM) models. However, many of these experiments are not sensitive to MeV scale DM as the corresponding recoil energies are much below the detector thresholds. In this regard, we reexamined the light scalar DM in a model-independent approach in our recent work. For such a DM, it should not be assumed that it annihilates into a pair of free quarks. Instead, it becomes necessary to determine the effective couplings of DM to hadrons and calculate the annihilation rate with hadrons in final states. In this talk, I will discuss the methodology for determining this effective coupling along with various constraints coming from cosmological and astrophysical observations.

Presenter: SACHDEVA, Divya (University Delhi)

Contribution ID: 2

Type: **not specified**

Update on b to s anomalies after Moriond 2019

Monday, 24 June 2019 14:30 (1 hour)

Flavour Changing Neutral Currents (FCNC) are an excellent probe for the search of New Physics. Therefore, LHCb has put a particular care in the study of B decays mediated by FCNC starting from Run I and with more data being presently acquired during Run II. Tensions between present data and Standard Model predictions have been found in some of these channels, hinting at a possible violation of Lepton Flavour Universality. I will review the status of these tensions after the latest result presented at Moriond 2019, assessing with particular care the theoretical cleanness of the observables displaying such tensions. Then, I'll discuss the possible explanations for such a pattern of anomalies both within and beyond the Standard Model, employing a model independent EFT framework. Finally, I'll review a possible loop model capable to address such anomalies.

Presenter: Dr FEDELE, Marco (ICCUB)

Contribution ID: 3

Type: **not specified**

Searching for long-lived particles from light dark sectors

Tuesday, 25 June 2019 11:00 (1 hour)

Dark matter-motivated light dark sectors often feature long-lived hidden sector states. Their presence offers bright detection prospects at fixed target experiments and colliders and may lead to strong astrophysical bounds. We will illustrate this point by exploring explicitly a typical simple fermion light dark matter setup, then expanding to limits on an effective theory of light dark sectors. In particular, we will investigate in detail the semi-visible three-body decays of dark sector states and show that it is a key element of the accelerator phenomenology of such models.

Presenter: DARME', Luc (Nat. Centre Nuclear Research, Warsaw)

Contribution ID: 4

Type: **not specified**

Effective field theories for lepton dipole moments: updates and applications

Tuesday, 25 June 2019 14:30 (1 hour)

The status of the research on effective field theories for lepton dipole moments will be reviewed. Standard Model Effective Field Theories (SMEFTs) at high and low energies will be reviewed in light of current and future bounds from experiments on lepton flavour violation. In addition, some modern techniques for multi-loop computations in SMEFTs will be reviewed and applications to ultra-violet complete theories will be shown

Presenter: PRUNA , Giovanni Marco (Roma 3)