Stage M2: Can we see a leptoquark around 1 TeV?

Damir Becirevic

Embedding the Standard Model in a larger theory, such as the one based on SU(5) group, can lead to the emergence of new gauge bosons which couple to both quarks and leptons, also known as leptoquarks. Current experiments at LHC provide us with multitude of possibilities to detect such a state in the mass range around 1 TeV.

Besides direct searches, the existence of a leptoquark with mass around 1 TeV can be tested through indirect searches, leptonic and radiative decays of leptons and hadrons.

Student will first become familiar with building a theory of grand unification based on the SU(5) gauge group, and then focus on a specific scenario of the doublet of scalar leptoquarks in which he/she will compute the leptoquark contributions to the anomalous magnetic moment of leptons, $\mu \to eee$ and $\mu \to e\gamma$ decays.