



MARCH
02
2015
Irchel
Campus
Y16 G15
4:00 pm



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The Mysterious Flavours of the Universe

What is the universe made of? Particle physicists have developed a “Standard Model” that answers this with a set of only four particles as building blocks. Yet two massive replicas of these “flavours” exist for no known purpose, and their masses and mixings appear arbitrary. I will discuss recent developments that could suggest a change of paradigm in this understanding. Moreover, astrophysicists and cosmologists have shown that most of the

mass of the universe is composed of an unknown kind of “dark matter”, probably in the form of new particle(s). Neutrinos and dark matter are the most abundant particles and may provide the ultimate clue to flavour and to the absence of antimatter in the visible universe. I will overview the status of the flavour puzzle, with emphasis on new light shed by the neutrino sector and experimental consequences.

