



KCETA Colloquium

Modular Invariance and the Flavor Puzzle

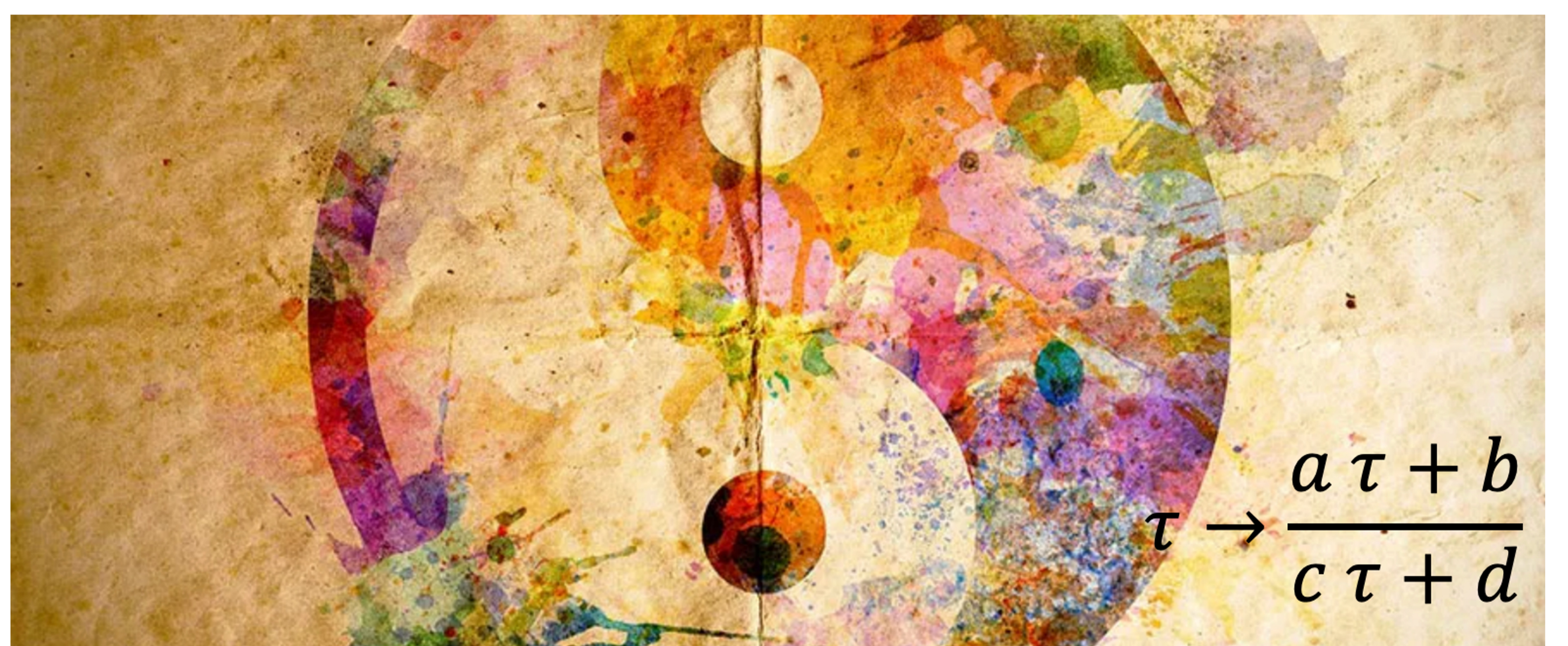
Thursday, February 1, 2024

Kleiner Hörsaal A (CS) 15:45 - 17:00

Prof. Ferruccio Feruglio
(INFN – Padova)

The flavor sector of particle physics requires more than 20 parameters for a complete description. Despite the very precise available data, the origin of these parameters remains obscure. Such a flavor puzzle is one of the most profound and fascinating problems of fundamental interactions. The hope of deriving these parameters from a fundamental principle has led scientists to explore a great variety of symmetries patterns.

In this talk, I will show how the role of flavor symmetry can be played by modular invariance, ubiquitous in string theory and condensed matter systems. Modular invariance can be explored in a consistent bottom-up approach, which here will be reviewed and applied to neutrino masses and mixing angles. Despite the freedom inherent in model building, a set of universal predictions free from ambiguities can be formulated when the theory approaches a critical point, much as in the case of phase transitions. In addition, modular invariance can shed light on one long-standing mystery of the quark sector, the strong CP problem.



Please note: The colloquium will also be live-streamed to B402 SR 224 (CN).