



Contribution ID: 48

Type: **Oral**

CP Violation and the Search for Electric Dipole Moments

Monday, 16 October 2017 10:45 (40 minutes)

CP violation presents two major puzzles for our understanding of fundamental physics. On one hand, we do not know the origin of the CP violation observed in quark mixing. On the other, the amount of CP violation that is seen is not enough to account for the excess of matter over antimatter and appears to be anomalously small compared to what is expected from the structure of the strong force. Upcoming searches for permanent electric dipole moments (EDMs) will play a central role in addressing these questions. In this talk I will explain how tests of EDMs will teach us about the mechanism underlying the matter asymmetry, the flavour and CP structure of new physics beyond the Standard Model, and the resolution to the strong CP problem.

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