

XVth Quark Confinement and the Hadron Spectrum



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Strong Dynamics: A Treasure Trove for Standard Model Physics and Beyond

Monday 19 August 2024 12:00 (30 minutes)

After discussing the landscape of strongly interacting field theories, I will introduce novel theoretical approaches aimed at solving their complex dynamics. Following this, I will explore applications to particle and astroparticle physics, including the discovery of new strong dynamics via gravitational wave observatories. In the realm of particle physics, I will provide a mathematical classification of various extensions to the Standard Model based on their degree of naturalness. I will argue for the existence of a dual description of the Standard Model using “electric” variables, inspired by Dirac’s electromagnetic duality and gauge-gauge duality in supersymmetric quantum field theories (QFTs). Finally, I will present a toy dual Standard Model to highlight key aspects of duality, offering potential elegant solutions to longstanding problems, such as the existence of three generations and the possibility that the Standard Model is a natural theory hidden in plain sight.

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