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ECT\* - VILLA TAMBOSI, VILLAZZANO

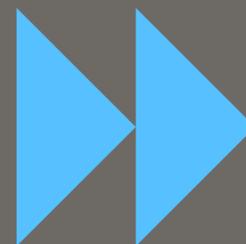
# LATTICE GAUGE THEORIES AND QUANTUM ERROR CORRECTION: A UNIFIED PERSPECTIVE

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Gauge theories lie at the heart of the Standard Model, and lattice gauge theories (LGTs) provide one of the most powerful frameworks for studying non-perturbative regimes. In settings where classical simulations are hindered by exponential complexity, quantum computers have emerged as a promising alternative. However, despite significant progress in quantum hardware, noise remains a major obstacle, making quantum error correction essential for reliable large-scale computations. In this talk, I will retrace the path that led to the realisation that lattice gauge theories and quantum error correction are deeply connected, and can be viewed as two aspects of the same underlying structure. Starting from the initial idea introduced in 2023, I will review the development of this perspective, highlighting recent results, ongoing work in Trento, and future directions of this emerging research area.

*Please, facilitate the organization of the seminar and coffee break by registering via the QR code. Thank you.*



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ECT\* Director: Prof. Ubirajara van Kolck

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