

Laplacians on (quantum) metric spaces

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ABSTRACT

The Laplacian is a cornerstone of geometry and analysis, shaping our understanding of spaces ranging from smooth manifolds to graphs and beyond. In this talk, we explore the evolution of Laplacians, moving from local operators like the Laplace-Beltrami operator on manifolds to non-local counterparts such as fractional Laplacians. Extending these ideas to the quantum setting, we explore how spectral data encodes geometry in spaces that transcend classical intuition. Along the way, we uncover surprising connections between dynamics, fractal geometry, spectral geometry and optimal transport, illustrating the versatility and unifying power of the Laplacian.