

DISCRETE 2014: Fourth Symposium on Prospects in the Physics of Discrete Symmetries



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The Moebius symmetry of quantum mechanics

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Adaptation of the Hamilton-Jacobi formalism to quantum mechanics yields a cocycle condition which is invariant under D-dimensional Mobious transformations. The invariance under Mobious transformations can only be implemented consistently if space is compact and implies energy quantisation and undefinability of quantum trajectories. It implies the existence of a fundamental length scale that may be identified with the Planck length.

Consistency of phase space duality is a complementary facet of the formalism and may serve as the fundamental physical principle underlying quantum mechanics. Evidence for the compactness of space may exist in the cosmic microwave background radiation.

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