

Emergence of Constructor-Based Irreversibility in Quantum Systems

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How irreversibility arises in a universe with time-reversal symmetric laws is a central problem in physics. In this talk, we discuss a radically different take on the emergence of irreversibility, adopting the recently proposed constructor theory framework. Irreversibility is expressed as the requirement that a task is possible, while its inverse is not. We prove the compatibility of such irreversibility with quantum theory's time-reversal symmetric laws, using a dynamical model based on the universal quantum homogenizer.