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【626】 Quantum Rings with Broken Symmetries

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We present novel quantum rings, which for example are fabricated from Rashba materials. These rings make use of the little explored interface between quantum mechanics and classical physics –their function is based on quantum collapses of electron wave packets combined with the coherent evolution of the quantum states. The devices feature fascinating properties such as unidirectional transport of matter waves and information. In particular, they reveal a fundamental inconsistency between quantum physics (including collapse processes) and the second law of thermodynamics.

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