

Quantum Buridan's Ass

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The interplay between symmetry and dynamics is central to physics, as well as to other branches of science. An interesting situation arises in decision making when you are offered several equally viable solutions and you are forced to select one. The ensuing delay is generally known as the Buridan's paradox. We investigate a sketch of this situation in the context of optical multiports and comment on the role of symmetry and how physics deals with the dilemma of many options.

It is noteworthy that in its simplest form the evolution away from its initial state is speeded up by quantum interference. However, more fully connected networks can display the frustration familiar from the classical paradox. The role of symmetry breaking is analyzed for several cases and implications for the paradox discussed. Our results have implications for quantum communications networks and other distributed quantum systems.