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Black hole motion as a quantum object or as a classical object
CAROLINE HERZENBERG — Results of a recent study of transition between quantum and classical behavior are now applied to black holes. The study, based on modification of quantum behavior in a cosmological context, predicts the existence of an uncertainty in spatial position dependent upon the mass of an object, and leads to a criterion separating quantum from classical behavior. Specifying that such an uncertainty in position be smaller than the size of the object defines a critical size that appears to provide a fundamental limit distinguishing the realm of objects governed by classical laws from those governed by quantum mechanics. A new application of this criterion to black holes indicates that the motion of small black holes would be characteristically quantum mechanical, while the motion of large black holes would be classical, with the threshold distinguishing these behaviors at a Schwartzschild radius of roughly the size of a nucleon.

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