

Black holes and particle physics: on the topology of space-time

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Understanding the behaviour of microscopic black holes is essential for any plausible theory of quantum gravity. There is an issue about entangled particles moving in or emerging. We found that quite explicit calculations can be done, and discovered that one cannot ignore that what seems to be the inside of a black hole also has an asymptotic region. We conjecture that the only reasonable implication is that antipodal points on the horizon must be identified, which would turn the black hole in a quantum mechanically pure state, but gives space and time a non-trivial topological structure. Some amusing riddles can actually be solved.