

Theory CANADA 4 Conference
Conférence Théorie CANADA 4
4-7 June/Juin, 2008

Holonomy, Decomposability and Relativity

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Abstract

The holonomy decomposition theorem for Riemannian manifolds was first proven by de Rham. Roughly speaking, this theorem says that if the holonomy group of a manifold is a product, then the manifold itself is also a product. Wu extended this to Lorentzian manifolds, but left open a physically interesting case. We will discuss applications of some recent mathematical results to general relativity and in particular cover this loophole.