

HOPF-ALGEBRAIC HIGHER GAUGE THEORY, PATH AND SURFACE SIGNATURES, AND (MAINLY) BEYOND

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I will review old work on Hopf-algebraic formulations of 1- and 2-dimensional holonomy, derived from crossed modules of cocommutative Hopf algebras, and their relation to path and surface signatures. I will then address the algebraic formulation of three-dimensional holonomy, based on a 2-crossed module of Hopf algebras, in the realm of Gray 3-groupoids. (NB: No prior knowledge of category theory is assumed from the audience.)