Title: Semi Strict locally trivial principal G-2-bundles over smooth 2-spaces

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Date and Time: August 3, 2020; 11:00am

Venue: Google Meet

Abstract

Higher Gauge Theory is sometimes considered as a study of connection structures on higher principal bundles. Here, *higher* means that their structure groups are higher or in other words *categorified in an appropriate sense*. In this talk, I will restrict myself to only strict 2-group gauge theory. Previously, extensive work has already been done on strict 2-group gauge theory when the base of principal 2-bundles (*Higher principal bundles whose structure groups are strict 2-groups*) are smooth manifolds when considered as discrete Lie groupoids. According to the best of our knowledge, there is no published work which considered principal 2 bundles explicitly whose base is a category internal to generalized smooth spaces as well as which also enjoys weak local triviality in an appropriate sense. In this talk, I will define a possible notion of weakly locally trivial principal 2 bundles over a category internal to generalized smooth spaces. In the course of defining, I will develop the required theory on the way from the scratch. Then, I will discuss in brief about our ongoing work of how a specific class of these objects can be constructed from a specific class of non-Abelian cocyle Gerbe over a manifold. Ultimately, at the end of my talk, I will propose a possible notion of connection structure on these objects. Also, if time permits, I will mention about some other closely related projects that I am currently working on along with it.