

# Lower Gauge Theory

Dead Duck or Phoenix?

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Oscar I. Hernandez

Riverside, CA, 92507

[oscar.hernandez@simons-rock.edu](mailto:oscar.hernandez@simons-rock.edu)

## Abstract

Gauge theory is used to describe the parallel transport of particles using connections on bundles. The use of higher gauge theory which uses 2-connections on 2-bundles to describe the parallel transport of points and 1-dimensional strings suggests the existence of a “lower gauge theory” which would apply  $\{-2, -1, 0\}$ -categories to the study of parallel transport of lower-dimensional objects. We will explore such a theory and its applicability.

## 1. Introduction

While this may sound slick, it’s probably not worth pursuing a mathematical theory which aims to solve problems regarding physical objects of negative dimension.

## 2. Future Work

We encourage the reader to abandon this line of research, and focus instead on ordinary or higher gauge theory and their applications to physics and economics.

## References

- [HGT] J. Baez and U. Schreiber Higher Gauge Theory *Hamburg Preprint ZMP-HH/05-25*. 2005. <https://arxiv.org/abs/math/0511710>
- [CPI] P. Malaney The Index Number Problem: A Differential Geometric Approach *Harvard University*. 1996.