

TOPOLOGY SEMINAR

Guest Speaker: Ralph Kaufmann
Purdue University

Date: Tuesday, April 2, 2019

Time: 2:30 PM

Location: 258 Hurley Hall



Lecture Title:

Categorical encoding of operations/Feynman categories and moduli spaces

Abstract

Talk I: Categorical encoding of operations Abstract: Operations of many inputs and many outputs can be neatly be encoded as functors from certain combinatorial categories. These categories are called Feynman categories. We will give the relevant ideas, examples and definitions. Thus subsumes all theories such as operads, PROPs, modular operads, FI-modules etc, as we will explain.

Talk II: Feynman categories and moduli spaces. Abstract. One advantage of using Feynman categories is that the classical structures become functors and hence one can use standard push-forward and pull-back operations on them. In particular, using this idea on two basic categories, one can reconstruct several combinatorial categories underlying moduli spaces of curves or open and closed TFT. At this combinatorial level, this can be compared to triangulations of surfaces (with boundary). There is a second and third level to these constructions. In the second level, which is joint work with Clemens Berger, we can use a W-construction, previously defined with Ben Ward, to produce the actual moduli spaces via a derived push-forwards. The third level are compactifications through master equations which is work in progress together with Javier Zuniga. The latter is linked to Hopf algebras and renormalization.