Graduate Student Seminar

UNIVERSITY OF NOTRE DAME
Department of Mathematics

Speaker: Pavel Mnev
University of Notre Dame

Monday, March 26, 2018
4:00 PM
125 Hayes-Healy Hall

Title: From the algebra of discrete differential forms on an interval to topological field theory

Abstract:

Trying to construct a combinatorial version of de Rham algebra on an interval, one stumbles into the failure of associativity. It turns out that associativity can be repaired in the "up-to-homotopy" sense: the discrete analog of de Rham algebra on an interval turns out to be an A-infinity algebra. More generally, on a simplicial complex one can consider the Whitney forms -- special piecewise-linear forms, representing the cellular cochains. They also fail to be a strict differential graded algebra but form instead an A-infinity algebra. We will discuss these constructions, how they connect to the topological quantum field theory and how they allow one to construct and compute interesting invariants of manifolds, e.g., the Massey operations on cohomology, together with certain "quantum Massey operations".