Department of Mathematics
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ALGEBRAIC GEOMETRY AND COMMUTATIVE ALGEBRA SEMINAR

Speaker: Ralph Kaufmann
Purdue University

Date: Thursday, March 21, 2024
Time: 3:30 PM
Location: 258 Hurley Bldg
Zoom URL: NA

Lecture Title:

The algebra of categories and its application

Abstract

There is a way to encode categories as bimodule algebras which is particularly suited to treat equivariant aspects. Utilizing this point of view many operations known from algebra become readily available for categories, such as coalgebras, free (co) modules, bar/cobar resolutions and so on. Moving to monoidal categories adds another multiplicative structure and directly leads into the theory of PROPs, Feynman categories and unique factorization categories. Feynman categories are then easily defined as coming from those bimodules whose free modules are monoidal. Bi- or Hopf algebras and Connes-Kreimer type B_+ operators as CoHochschild cocylces also naturally appear in this context. In a second direction one can consider the generalization of quadratic algebras and Koszul duality. In the newest developments there is a conjecture relation between cubical -the right notion of quadratic- structures and cluster-like transformations, which we will address if time permits.