BI-CO MATHEMATICS COLLOQUIUM

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"From Lie Algebras to Catalan Numbers and Beyond"

Monday, October 8, 2018

Talk at 4:00 – Park 338
Tea at 3:30 – Park 361, Math Lounge

Abstract:
Given a vector space of matrices, one can impose a binary operation called a commutator, given by $[A, B] = AB - BA$. This operation satisfies a condition called the Jacobi identity, turning this vector space into what is known as a Lie algebra. In this talk, I will introduce the concept of a Lie algebra as well as generalizations thereof called Lie Algebras of the Third Kind (LATKes) or n-th kind (LAnKes). These algebras have associated vector spaces that admit an action of permutation groups. I will explain how, for certain classes of these vector spaces, the permutations lead to a new interpretation of the famous Catalan numbers which are central in algebraic combinatorics. I will then discuss some related open problems.

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