



COLLOQUIUM

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Jordan Decompositions of Tensors and Applications to Quantum Information

Friday October 14th at 2:30pm in RT 1516

Bio: Dr. Luke Oeding is an Associate Professor of Mathematics and Statistics at Auburn University. He joined Auburn in 2013 after NSF sponsored postdoctoral positions at UC Berkeley (2011-2013) and Università Degli Studi di Firenze, Italy (2009-2011). He received his PhD in Mathematics from Texas A&M University in 2009. He studies Representation Theory, Combinatorics and Geometry.

Abstract: The Jordan normal form for matrices is a powerful classification tool as it provides a test to determine which matrices are similar (in the same orbit), and whether one orbit contains another or not. One wonders what a natural generalization to hypermatrices (tensors) would look like. We focus on the algebraic structure of Jordan decompositions, expanding on an idea of Vinberg to combine a tensor space and a natural Lie algebra acting on it into an auxiliary algebra. Viewed as endomorphisms of this algebra we associate adjoint operators to tensors. We show that the group actions on the tensor space and on the adjoint operators are consistent, which endows the tensor with a Jordan decomposition. We utilize aspects of the Jordan decomposition to study orbit separation and classification in examples that are relevant for quantum information. This is joint work with Frederic Holweck (UTBM)

Refreshments will be served in RT 1517 at 2:10pm