Math and Cookies

Title: Impossible Linear Algebra over Fake Fields

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September 25 Friday 2020, 11:30-12:30 p.m. Online via Webex

Abstract: Linear algebra can be thought of as the study of vector spaces over a field, and linear transformations between them. In this interpretation, the field works like a variable: linear algebra looks different over the rational numbers, real numbers, or complex numbers. In spite of the differences, all of these flavors of linear algebra share a mysterious common core which can be described through combinatorics: we call this "linear algebra over the field with one element". In this talk we will develop this exciting theory, and see how it can be used to study combinatorial analogues to difficult problems in linear algebra. Recent work between the speaker and Dr. Jaiung Jun will be highlighted. No background in linear algebra will be assumed, and there will be examples to provide intuition for the theory.