

## **abstract**

COMPUTER SCIENCE/DISCRETE MATH I

Topic:

Speaker:

Affiliation:

Date:

Time/Room:

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A Freiman isomorphism is a fundamental object in additive combinatorics that allows one to move an additive problem from one group to another, all while preserving the salient additive properties. In this talk, we will discuss a new mapping result that lets one move an algebraic problem---that is, one with additive and multiplicative properties---from any characteristic zero integral domain to the field  $\mathbb{Z}/p$  of prime order, all while preserving the salient additive and multiplicative properties. This new mapping result allows us to obtain several combinatorial results for any characteristic zero integral domain, including the Szemerédi-Trotter Theorem, sum-product estimates, and the Erdős distance problem. Since the complex numbers are a characteristic zero integral domain, we have obtained new proofs of these combinatorial results without relying on the topology of the plane.