

Student Algebra Seminar

Illinois State University

1:00–1:50 PM, December 2nd, 2021

Speakers: Jeremy Corry, Elizabeth Grimm, and Andrew Hatfield

Rings Whose Unit Group is Elementary Abelian

Abstract: Robert Gilmer classified all finite commutative rings R with identity such that the group of units of R is cyclic. After cyclic groups, an important family of finite groups is the class of elementary abelian p -groups - a direct sum of copies of the cyclic group C_p , where p is a fixed prime. These groups feature in many fields, including topology, group cohomology, and representation theory. Inspired by Gilmer's result, we ask: what are all rings whose unit group is an elementary abelian p -group?

In joint work with Sunil Chebolu, we answer the above question for commutative rings, finite-dimensional k -algebras, modular group algebras, path algebras, and matrix algebras. Our results also give some characterizations of Mersenne primes and establish a connection to Dedekind's problem.

This research is the outcome of MAT 411 (Selected Topics in Advanced Mathematics), a graduate course taught by Sunil Chebolu in Fall 2021 at ISU.

This presentation will be on zoom, and all are invited.

Meeting ID: 920 6165 3023

Passcode: isumath

