

BI-CO MATHEMATICS COLLOQUIUM

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"Towards Explicit Class Field Theory Beyond the Imaginary Quadratic Case"

Monday, October 18, 2021

Talk at 4:00 - Park 338

Tea at 3:30 - Park 361

Abstract:

Prime numbers are the basic building blocks of the integers; every integer can be written uniquely as a product of primes. This pleasant property fails in certain generalizations of the integers, and this failure can be measured by a certain finite abelian group called the class group. Class field theory—one of the great achievements of number theory during the first half of the 20th century—guarantees the existence of a special extension field, called the class field, of the field of fractions of these generalized integers, but explicitly constructing a polynomial that generates the class field has proved extremely difficult. A satisfactory result is only known in the imaginary quadratic case, and that involves a deep study of elliptic curves with complex multiplication. In this talk we will introduce all of these concepts—generalized integers, class groups, class fields, and explicit class field theory for imaginary quadratic fields—and end with some joint work with Preston Wake about explicit class field theory for higher degree extensions.

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