BI-CO MATHEMATICS COLLOQUIUM

Jaclyn Lang

Temple University

"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, Math Lounge

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.

BRYN MAWR COLLEGE