Undergraduate Mathematics Colloquium

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"Diophantine equations and the Hasse principle"

Monday November 22
Talk at 4:00 in Herman Brown 227

ABSTRACT: Famously, Fermat in 1637 claimed to have a proof that there are no solutions to the equation $x^n + y^n = z^n$ for n at least 3, with none of x, y and z equal to zero. However, the statement remained unproven until 1995, when Wiles used modern tools from number theory and algebraic geometry to provide a proof. Fermat's Last Theorem falls into the theory of diophantine equations, which deals with solving polynomial equations in the integers or the rational numbers. In this talk, I'll explain the Hasse principle, which is one modern-day tool used by arithmetic geometers to understand the set of rational solutions to a polynomial equation. Along the way, we'll introduce the p-adic numbers and the notion of p-adic solutions to a polynomial equation.

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