

UBC Number Theory Seminar: November 3, 2021

Speaker: Natalia Garcia-Fritz (Pontificia Universidad Católica de Chile)

Title: Approaching Hilbert's Tenth problem for rings of integers of number fields through Iwasawa theory

Abstract: After the solution by Davis, Putnam, Robinson and Matiyasevich of Hilbert's Tenth problem for the integers, a natural extension that remains mostly open is the analogue for rings of integers of number fields. Several cases were proved in the seventies and eighties by Denef, Lipshitz, Pheidas, Shlapentokh, Videla and Shapiro, but after that point there has been a long hiatus on unconditional results. Most recently, elliptic curve criteria by Poonen, Cornelissen-Pheidas-Zahidi and Shlapentokh have led to a complete solution under standard arithmetic conjectures, thanks to the work of Mazur-Rubin and Murty-Pasten. In this talk, I will present some unconditional cases proved in joint work with Hector Pasten. The proof is based on the elliptic curve criteria, and it uses recent techniques from Iwasawa theory and Heegner points.