Brownsville Seminar

The University of Texas Rio Grande Valley
School of Mathematical & Statistical Sciences

Studying Hilbert's 10th problem via explicit elliptic curves

Speaker:
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Abstract:

In 1900, Hilbert posed the following problem: "Given a Diophantine equation with integer coefficients: to devise a process according to which it can be determined in a finite number of operations whether the equation is solvable in (rational) integers."

Building on the work of several mathematicians, in 1970, Matiyasevich proved that this problem has a negative answer, i.e., such a general 'process' (algorithm) does not exist.

In the late 1970's, Denef–Lipshitz formulated an analogue of Hilbert's 10th problem for rings of integers of number fields.

In recent years, techniques from arithmetic geometry have been used extensively to attack this problem. One such instance is the work of García-Fritz and Pasten (from 2019) which showed that the analogue of Hilbert's 10th problem is unsolvable in the ring of integers of number fields of the form $\mathbb{Q}(\sqrt[3]{p}, \sqrt{-q})$ for positive proportions of primes p and q. In joint work with A. Lei and F. Sprung, we improve their proportions and extend their results in several directions. We achieve this by using multiple elliptic curves, and by replacing their Iwasawa theory arguments by a more direct method.

Date: Friday, April 5th , 2024

Talk time: 2:00-3:00 pm

Talk location: BLHSB 1.316
and in
Zoom
https://utrgv.zoom.us/j/85333215080

Coffee and cookies will be provided!

For further information or for special accommodations, please contact Dr. Alexey Glazyrin via email alexey.glazyrin@utrgv.edu. More information about the seminar talks is available at the website https://www.utrgv.edu/math/news-events/seminars/brownsville/index.htm.