Department of Mathematical Sciences

Spring 2019

Colloquium Series

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Playing with Triangular Numbers

A number m is said to be triangular if it can be written as $1+2+3+\cdots+n$ for some integer n. The first triangular numbers are $1, 3, 6, 10, 15$. The number 10 is triangular and it is the sum of 3 consecutive triangular numbers. Let k be a positive integer. In this talk we'll explore the following question: Is there a triangular number that can be written as the sum of k consecutive triangular numbers? We will show that for infinitely many k, the answer is YES, but that that set has density zero. In our route to this proof we'll travel through different areas of number theory: Pell equations, the Cohen-Lenstra heuristics for class numbers, and sieve methods.