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Diophantine sets and Hilbert's tenth problem

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Hilbert's tenth problem asked for an algorithm to decide, given a multivariable polynomial equation, whether it has a solution in integers. After Matiyasevich in 1970 completed the proof that no such algorithm exists, the same question has been asked for solutions in other rings and fields. Much has been learned also about what subsets are first-order definable in rings and fields that number theorists and algebraic geometers care about. I will survey these topics, including recent advances and prospects for future study.

Author: Prof. POONEN, Bjorn (MIT)

Presenter: Prof. POONEN, Bjorn (MIT)