Diophantine Approximation, Fractal Geometry, and Shrinking Targets

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Abstract:

Diophantine Approximation, Fractal Geometry, and the study of Shrinking Targets, are three important and at first sight seemingly unrelated areas of mathematics. The purpose of these lectures is to introduce these topics and to study some problems that lie at their intersection. In the first lecture we will introduce the shrinking target problem and prove a classical result for the doubling map. This result and its proof exhibit some of the key ideas in this area. In the second and third lectures we will focus on some more modern results and discuss some open problems.