

PHILADELPHIA AREA NUMBER THEORY SEMINAR

The geometric nature  
of Diophantine equations:  
rational points on algebraic surfaces

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February 12th at 2:40 pm  
Bryn Mawr College, Park 336<sup>1</sup>  
Tea and cookies in Park 361 at 2:20 pm

**Abstract:** Does there exist a box such that the distance between any two of its corners is a rational number? Which integers can be expressed as the sum of three cubes? These questions and many others can be reframed as Diophantine problems, that is, questions of existence of rational or integer solutions to polynomial equations. Each such Diophantine problem has a geometric manifestation called an algebraic variety whose properties often shed light on why these questions do not have elementary answers. In this talk I will give an introduction to the guiding principle that geometry influences arithmetic, and describe work on the existence of (and obstructions to) rational solutions to equations that define algebraic surfaces (e.g. K3 surfaces).

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<sup>1</sup>Notice the room change is different than past years.