

The Oliver Club

www.math.cornell.edu/~oliver/

Rational Polygonal Billiards: Veech Polygons and Tricky Billiard Shots

The behavior of a billiard ball in a planar billiard table depends delicately on the properties of the table. One interesting situation occurs when the table is a polygon and the angles are rational multiples of π . The behavior of trajectories in this case is not chaotic but it can be far from simple.

The behavior of trajectories in the square is analyzed in Hardy and Wright's classic book on number theory from 1938. For most other rational polygons the precise analysis of the behavior of trajectories remained mysterious until 1989 when William Veech introduced a larger class of polygons for which detailed analysis of billiard trajectories is possible. This class includes all regular polygons. Veech's construction has led to a flurry of activity in the field of polygonal billiards and translation surfaces.

I will describe some of this work and explain how the class of polygons introduced by Veech is precisely the class in which certain trick billiard shots can be made safely.



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*Refreshments will be served at 3:45 PM
in the Mathematics Department lounge
(532 Malott Hall).*

**Thursday, September 14, 2006
at 4:25 PM in 406 Malott Hall**