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**Richard E Schwartz\*** ([res@math.brown.edu](mailto:res@math.brown.edu)), Dept of Mathematics, Brown University, 161 Thayer St, Providence, RI 02912. *Polygonal Outer Billiards.*

Outer billiards is a geometrically inspired dynamical system based on a convex shape in the plane. When the shape is a polygon, the system produces rich dynamics with a combinatorial flavor, as well as intricate and poorly understood tilings of the plane. In my talk I will explain outer billiards and highlight some of its beautiful features. I will also sketch the proof of my solution to one of the main questions in the subject, the Moser-Neumann problem: Do there exist outer billiards systems with unbounded orbits. My main result is that outer billiards has unbounded orbits relative to any irrational kite. (A kite is a convex quadrilateral with bilateral symmetry.) I will illustrate my talk with computer demos, using my program Billiard King, a graphical user interface I created to explore the problem. (Received March 24, 2010)