1106-37-2174 **Alex Wright*** (`amwright@stanford.edu`). *From rational billiards to dynamics on moduli spaces.*
Consider a billiard ball bouncing around in a polygon. This simple system demonstrates remarkable complexity–for example, it is an open problem to prove that there is a periodic billiard trajectory in every polygon. However, if the angles are all rational multiples of $\pi$, a great deal is known. This is because such a polygon can be "unfolded" to give a surface with extra structure, and there is an $SL(2,\mathbb{R})$ action on the space of all such surfaces. We will explain the relevance of this action, and state a recent result of Eskin, Mirzakhani and Mohammadi, which gives that the closure of every $SL(2,\mathbb{R})$ orbit is a manifold. We will explain how this result was inspired by results on homogeneous spaces. (Received September 16, 2014)