1117-37-361 **Paul Apisa*** (papisa@math.uchicago.edu). *Rational billiards, hyperelliptic curves, and dynamics on moduli space.*

Every holomorphic one-form on a Riemann surface corresponds to a collection of planar polygons with sides identified by translations – a translation surface. The action of GL(2,R) on the plane induces an action on planar polygons and hence on the moduli space of holomorphic one-forms. Work of Eskin, Mirzakhani, Mohammadi, and Filip establishes that GL(2,R) orbit closures are complex subvarieties. We will classify GL(2,R) orbit closures of dimension greater than three in hyperelliptic components of strata and verify a conjecture of Mirzakhani - that higher rank orbit closures arise from loci of branched covers – in these components. As corollaries, we will derive finiteness results for geometrically primitive Teichmuller curves in hyperelliptic components and discuss applications to the illumination and finite blocking problems in rational billiards. (Received January 18, 2016)