

# APOLLONIA

Katherine Stange  
University of Colorado, Boulder

Apollonian circle packings — and in particular, the collection of curvatures of such a packing — are a particularly pretty example of the orbit of a thin Kleinian group. In many such packings, the collection of curvatures consists entirely of integers. Such orbits are conjectured to follow a local-global principle in the sense that, except for a congruence obstruction modulo 24, all sufficiently large integers are expected to appear. I will describe some of what I've learned and participated in concerning proving the density of curvatures in an Apollonian circle packing and similar packings, and, more recently, in any  $r$ -almost prime component of such a packing. The methods and players include quadratic forms, the circle method, and expander graphs.