1047-11-4   **Jeffrey C. Lagarias*** (`lagarias@umich.edu`), Dept. of Mathematics, University of Michigan, 530 Church Street, Ann Arbor, MI 48109-1043. *From Apollonian circle packings to Fibonacci numbers.*

Apollonian circle packings are infinite packings of circles, constructed recursively from a initial configuration of four mutually touching circles by adding circles externally tangent to triples of such circles. If the initial four circles have integer curvatures, then so do all the circles in the packing. If in addition the circles have rational centers, then so do all the circles in the packing. This talk describes results in number theory and group theory arising from such packings. In particular, the integer curvatures in a packing are determined by the orbit of an integer vector under the action of an integer matrix group. Recently, strong results on factorization and primality of these integers were obtained by Bourgain, Gamburd and Sarnak. We contrast these properties with those of Fibonacci and Lucas numbers, which are also describable by an orbits of an integer vectors under a different integer matrix group. (Some results presented were obtained with Ron Graham, Colin Mallows, Allan Wilks, Catherine Yan, and Jon Bober.) (Received July 10, 2008)