1145-37-2554 **Diana Davis***, 500 College Avenue, Swarthmore, PA 19081. *Continued fractions for the golden L, and billiards in the pentagon.*

We give a method analogous to the continued fraction algorithm, to put a tree structure on the set of all periodic directions on the golden L. This gives us an associated tree structure on the set of periodic directions for the regular pentagon billiard table and its associated surfaces, which we use to understand the periodic trajectories. I'll show examples of many periodic billiard trajectories on the pentagon, which are strikingly beautiful, and describe some of their surprising properties. (Received September 25, 2018)