1125-37-465   **Diana Davis*** (`07djd@williams.edu`), Williams College, Department of Mathematics and Statistics, 18 Hoxsey Street, Williamstown, MA 01267. *Periodic billiard paths on the pentagon.*

On the square billiard table, saddle connections are given by relatively prime integer vectors $[a, b]$, and a trajectory in this direction has period $2(a + b)$; this is the only shape for which these results were known. We find the analogous results for the regular pentagon billiard table. We do this by relating the double pentagon to the golden L, and creating a tree structure on the set of periodic directions. The periodic paths turn out to be very beautiful, and I will show many pictures that we created with Sage. This is joint work with Samuel Lelièvre. (Received September 02, 2016)