

1158-53-367

**Jeffrey S. Meyer\*** ([jeffrey.meyer@csusb.edu](mailto:jeffrey.meyer@csusb.edu)) and **Brian Benson**. *Programming Sage to Compute Cheeger Constants*. Preliminary report.

The goal of this talk is to outline recent work with Brian Benson in which we use Sage to explicitly compute the Cheeger constants of certain principal congruence hyperbolic surfaces. Applying the Cheeger and Buser inequalities to Selberg's celebrated spectral gap theorem, it follows that the Cheeger constants of principal congruence surfaces are uniformly bounded from above and below. There has been significant work over the years to improve these bounds. However, explicit computations of these Cheeger constants have remained notoriously absent. In this talk, I will give a quick introduction to principal congruence surfaces. I will use Sage to produce certain fundamental domains called Farey domains. I will explain and demonstrate how our code searches for and finds the Cheeger constants for small  $n$ . There will be many colorful pictures. (Received March 03, 2020)