1153-14-307 **Andrew T. Lavengood-Ryan*** (andrew.lavengoodryan@csusb.edu), Riverside, CA 92503, and **Jeffrey S. Meyer**. *Using Sage to Compute Systoles of Arithmetic Genus 2 Surfaces.* Preliminary report.

What is the shortest loop, or systole, on an arithmetic genus 2 surface (AGS)? In this talk, I plan to report on an ongoing project with Jeffrey S. Meyer in which we use Sage to answer this question. To begin to answer this question, we reference the finite list of these surfaces and the associated algebras and find the elements with small trace. This would have been an inefficient strategy to employ without the use of smart algorithms. However, with the aid of Sage, we are able to quickly generate these group elements as well as some visual representations of the surfaces they live on and the associated geodesics. By examining the visual representation and using a sorting algorithm, we are able to quickly locate candidates for the systole of the AGS. I will give examples of these visual representations as well as show some of the code that was used to find these elements. While Sage allows for a direct check to find the systole in some situations, we frequently must appeal to more algebraic methods to pin down the systole itself. (Received August 30, 2019)