CCSU

DEPARTMENT OF MATHEMATICAL SCIENCES

COLLOQUIUM

Friday, October 3

3:00 – 4:00 PM

Maria Sanford, Room 101

RIEMANN SURFACES, TRANSLATION SURFACES, AND SYSTOLES

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Abstract: Mathematical objects often have multiple interpretations depending on the perspective. In this context, we focus on surfaces and compare two different structures: the classical Riemann surface, rooted in complex analysis, and the more recent translation surface, which has gained attention in the study of rational billiards. While Riemann surfaces arise naturally in the study of complex functions, translation surfaces are tied to dynamical systems, specifically billiard dynamics where trajectories follow straight lines on polygonal tables.

We will explore both similarities and differences between these two structures, looking at how each provides a unique lens for understanding surface geometry. Additionally, we will briefly touch on systolic geometry, which studies the shortest non-contractible loop (the systole) on surfaces, and how these geometric properties relate to the broader structure of the surface.

Finally, we will present a construction (in collaboration with B. Muetzel and P. Buser) of translation surfaces with large systoles. This work combines translation surfaces with systolic geometry to create surfaces with interesting and useful geometric properties, particularly in the context of rational billiards.

To join us online use the following link: https://ccsu.webex.com/meet/gotchev

For further information: gotchevi@ccsu.edu; 860-832-2839;

http://mathcolloquium.sites.ccsu.edu/