

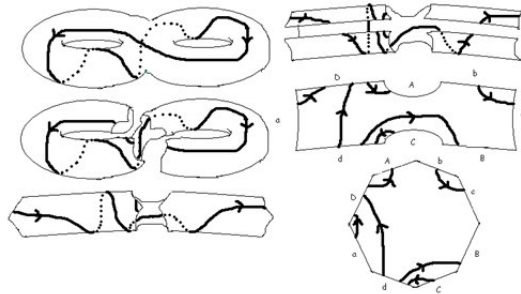
Stony Brook Math Club and Graduate Student Seminar

Wednesday, October 14, Math P-131

12:50–12:55pm Moira Chas, *Introduction*

12:55–1:45pm Chris Arettines, *Visualizing curves and their intersections on surfaces*

In the mathematical fields of topology, group theory and geometry, it is often useful to study a surface by representing it as a sequence of symbols, called a surface word, which captures the essential properties of the surface. Likewise, we can represent a curve on this surface by another sequence of symbols, called a cyclic word. This is done by cutting the surface in an appropriate way, flattening it into what is called the fundamental polygon, and labeling the cut edges. The surface is then represented by the labels of the edges, and the curve is represented by the labels of the edges of the polygon that it passes through. An example of this process is shown below.



We say that two curves on our surface are in the same deformation class if one can be smoothly deformed into the other without leaving the surface. For certain surfaces, the infinite variety of curves in a given deformation class are all associated with the same cyclic word, so we can study the properties of a deformation class simply by looking at the corresponding cyclic word. One such interesting property is the minimal number of times a curve in the class must intersect itself. A curve in a given deformation class may intersect itself arbitrarily many times, but there is always some minimal number of times the curve must intersect itself.

For this talk, I will go through the above concepts in more detail and present a simple algorithm which will produce a curve in a deformation class which has minimal self-intersection. The talk will be very informal and won't assume any advanced knowledge, so I encourage you to come and ask questions.

1:45–2:15pm *Pizza social*

Chris is currently a first-year graduate student in mathematics at CUNY Graduate Center. He graduated from Stony Brook in May 2009, having written an honors thesis on topology of surfaces under the supervision of Moira Chas.

All are welcome and undergraduates are especially encouraged to attend.