PURDUE UNIVERSITY | Department of Mathematics

Undergraduate Research Project

Project Name:	Variations of Pick's theorem and Piecewise Linear Geometry	**Number of Positions:**	1 or 2
Supervisor:	Sam Nariman		
Supervisor e-mail:	snariman@purdue.edu		
Project Description:	Pick's theorem gives a formula for the area of a planar integral polygon (where all vertices lie in ${\bf Z}^2$) in terms of the number of integral points in the polygon. Peter Greenberg developed Piecewise Linear SL_2(Z) geometry which in particular generalizes Pick's theorem. Greenberg observed relations to different parts of mathematics including Algebraic K-theory, foliations, etc. But our main goal is to explore this piecewise area preserving geometry based on Greenberg's works.		
Final Deliverables:	A written expository report and a short presentation. Students are encouraged to develop visualizations or small computational experiments		
Weekly Working Hours	6-8 hours		
For Credits/ Voluntary	Either		
Desired Qualifications	Required: Linear algebra (353), Combinatorics (e.g. working knowledge of graphs and simplicial complexes). Preferred: Topology		

If you are interested in participating in this research project, please send an e-mail to the supervisor e-mail listed above together with a resume, a list of what courses you've taken or a copy of your transcript, and a personal statement explaining why you are interested in this project.

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