

REU Seminar Series

Wednesday 1:00pm, Nesbitt Room

June 12

Vignesh Jagathese

(Mentor: Andrew Snowden)

Title: *A classification of certain symmetric ideals*

Abstract: The infinite symmetric group S_∞ acts on the ring $\mathbb{C}[x_1, x_2, \dots]$ by permuting the formal variables. Even though this ring is not Noetherian, if one only considers the ideals stable under the S_∞ action, it is known that those ideals satisfy the ascending chain condition. In this paper, we classify the " S_∞ -prime" radical ideals of a similar ring, $\mathbb{C}[x_1, x_2, \dots, y_1, y_2, \dots]$, where S_∞ acts on each x_i and y_i . This is accomplished by reducing the problem to classifying S_∞ -stable Zariski closed irreducible sets. We then discuss applications of the theory and future directions.

Stephen Jasina

(Mentor: Ian Tobasco)

Title: *Low Energy Band-Limited Surfaces*

Abstract: Consider a thin elastic sheet (for instance made of rubber) that can be stretched or bent, but not torn or creased. Natural distortions of this sheet can be predicted by minimizing a combination of energies including its stretching and bending ones. We are interested in energy minimizers that form patterns due to a totally compressive constraint. We simplify this problem by considering surfaces (graphs) described by doubly periodic, band-limited Fourier series with fundamental domain $[0, 1] \times [0, 1]$. This talk will present the background and motivation for our problem, as well as some preliminary results.

Drimik Roy Chowdhury & Zachary Halberstam

(Mentor: Caleb Ashley)

Title: *Riemann Surfaces through the Uniformization Theorem and Children's Drawings*

Abstract: Riemann surfaces are fundamental objects of interest in many branches of mathematics. We will interpret the uniformization theorem which states that, up to biholomorphism, there are only three simply connected Riemann surfaces: the Riemann sphere, the complex plane, and the open unit disk. As a consequence, a Riemann surface can be constructed as quotients of these three aforementioned spaces. We discuss these constructions with emphasis on covering theory. Furthermore, the fundamental theme of our REU will be to investigate how Dessin d' enfants may help distinguish Riemann surfaces from one another. This theory heavily relies on Belyi's theorem, which we will discuss.