

TUESDAY, APRIL 21
Lockett 235

3:15 – 3:35

The Sensitivity of Linear Systems

Jacob B. Aguilar

This talk will be a brief introduction to the theory and applications of the sensitivity of linear systems. We will introduce and discuss the condition number of a matrix A , and then demonstrate how it measures the linear system's amenability to digital computation. Then we will conclude with a brief discussion of how this theoretical tool is used in a computational setting.

3:35 – 3:55

Bézout Theorem

Sen Yang

This short paper intends to introduce the Bézout Theorem for complex projective curves on the complex projective plane. We give a fast proof when one curve is a line. The proof is due to I.R. Shafarevich. We also use Bézout Theorem to describe the group structure on a cubic.

3:55 – 4:15

Non-associative Addition and Non-Euclidean Geometry

Adam Cross

In Einstein's original paper on special relativity, he introduced a certain non-associative vector addition that was not much appreciated in his time. It was thought to lack any useful structure. It has been understood for some time that hyperbolic geometry arises out of the study of special relativity. Largely due to the work of A. A. Ungar, we are now beginning to understand the relationship between hyperbolic geometry and the non-associative algebra that arises from Einstein's vector addition. We will consider a specific illustration of the way this non-associative addition helps us to understand the hyperbolic geometry.

4:15 – 4:35

Introduction to Clifford Algebra

Yunyun Yang

The Clifford algebra is a very important tool in mathematical Physics. It is the natural algebraic tool for controlling subspaces and rotations/spins, and it itself also has an interesting mathematical structure. In this short talk I am going to introduce a definition of Clifford Algebra and discuss the semisimple structure on the Clifford Algebra C_d for $d \leq 2$. Also, I have gathered a few history fact in the development of Clifford Algebra to give us a glance about how mathematical concepts come out naturally and develop under the influence of other subjects.