The College of Arts & Sciences
Department of Mathematical Sciences

Colloquium

Professor Jeff Thunder

Northern Illinois University

Friday, October 19th
Room 4206, French Hall West
4:30 – 5:30 pm

Siegel's Lemma, Heights, and the Geometry of Numbers

A basic tool in Diophantine Approximation is Siegel's Lemma, which guarantees a "small" solution to any system of linear equations defined over a global field. Here "global field" initially meant the field of rational numbers, but has since been expanded to mean any number field, function field over a finite field, and even an algebraic closure of these. It is over such fields that one has the notion of a "height" and a "geometry of numbers." In this talk we will start with the basic statement of Siegel's Lemma over the rational integers, use that as motivation for a definition of height, and ultimately show how Siegel's Lemma may be viewed as an application of Minkowski's Convex Bodies Theorem(s) in the geometry of numbers. No previous knowledge of number theory or algebraic geometry will be assumed, just elementary undergraduate algebra. This talk should be accessible to all faculty, graduate students, and undergraduates who have taken linear algebra.

Refreshments will be served 3:45 – 4:15 pm in the Faculty & Graduate Student Lounge Room 4118 French Hall West

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