Office hours: Monday 3-4pm, Friday 4-4:30pm

You can find hand-written notes in the Files.

Welcome to Topics in Arithmetic Dynamics! Various problems in diophantine geometry can be cast in a dynamical language and thereby more general conjectures may be formulated.

A key example that will feature in this course is the **Manin-Mamford conjecture**, generalized by Zhang in the dynamical setting. Though this conjecture is still open, special cases have been established. We will explore some such results and their proofs. This will lead us to studying height functions and results from complex dynamics.

We will also discuss **relative** versions of the **Manin-Mumford conjecture** in **families of rational maps**, with emphasis on work of Baker and DeMarco. We will learn about Silverman's **specialization** result and see how it relates to stability of a `dynamical pair'.

The course will be based on recent papers in the young and thriving field which has many open questions.

Based on the participants' choices, we may decide on additional topics to cover. I encourage you to meet me individually, so that I can learn more about your background and what you would like to learn.

Prerequisites. Standard graduate-level courses in Analysis, Algebra, and Geometry are expected. Background in dynamical systems and algebraic number theory is helpful but not required.

Logistics. If you are taking this course for a grade, then you will be asked to complete a project on a topic related to arithmetic dynamics. I am very much open to your suggestions, but I will need to agree on the eventual choice. You may also be asked to present your project.

Useful references and textbooks

John Milnor, Dynamics in One Complex Variable, Third Edition

Mark Hindry and Joseph Silverman, Diophantine geometry, an introduction
Joseph Silverman, The Arithmetic of Dynamical Systems
Enrico Bombieri and Walter Gubler, Heights in Diophantine Geometry