The Arithmetic Seminar

TOPICS: Arithmetic in the broadest sense that includes Number Theory (Elementary Arithmetic, Algebraic, Analytic, Combinatorial, etc.), Algebraic Geometry, Representation Theory, Lie Groups and Lie Algebras, Diophantine Geometry, Geometry of Numbers, Tropical Geometry, Arithmetic Dynamics, Arithmetic Topology, etc.

PLACE and TIME: This semester the seminar meets primarily on Tuesdays at 4:00 pm, with possible special lectures at other days and times. The in-house talks will be in-person, while visitors outside of Binghamton area will be in-person or by Zoom: Zoom link

ORGANIZERS:
Regular Faculy: Alexander Borisov, Marcin Mazur, Adrian Vasiu.
Post-Docs: Huy Dang

Current Ph.D. students: Hari Asokan, Mithun Padinhare Veettil.

Graduated Ph.D. students (in number theory and related topics): Ilir Snopce (Dec. 2009), Xiao Xiao (May 2011), Jinghao Li (May 2015), Ding Ding (Dec. 2015), Patrick Milano (May 2018), Changwei Zhou (May 2019), Patrick Carney (May 2023), Sarah Lamoureux (Sep. 2023), Sayak Sengupta (May 2024).

SEMINAR ANNOUNCEMENTS: To receive announcements of seminar talks by email, please join our mailing list.

Related seminar: Upstate New York Online Number Theory Colloquium (online, irregular):
http://people.math.binghamton.edu/borisov/UpstateNYOnline/Colloquium.html

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Previous Arithmetic Seminar Talks

- ————————- Fall 2025
- Spring 2025 ——– Fall 2024
- Spring 2024 ——– Fall 2023
- Spring 2023 ——– Fall 2022
- Spring 2022 ——– Fall 2021
- Spring 2021 ——– Fall 2020
- Spring 2020 ——– Fall 2019
- Spring 2019 ——– Fall 2018
- Spring 2018 ——– Fall 2017
- Spring 2017 ——– Fall 2016
- Spring 2016 ——– Fall 2015
- Spring 2015 ——– Fall 2014

Spring 2026

- **January 27**
  Speaker: NA
  Title: Organizational Meeting
  Abstract:

- **February 3 (2:45-3:45 pm, cross-listed from Algebra Seminar)**
  Speaker: Tim Riley (Cornell University)
  Title: Conjugator length
  Abstract: The conjugacy problem for a finitely generated group G asks for an algorithm which, on input a pair of words u and v, declares whether or not they represent conjugate elements of G. The conjugator length function CL is its most direct quantification: $CL(n)$ is the minimal N such that if u and v represent conjugate elements of G and the sum of their lengths is at most n, then there is a word w of length at most N such that $uw=wv$ in G. I will talk about why this function is interesting and how it can behave, and I will highlight some open questions. En route I will talk about results variously with Martin Bridson, Conan Gillis, and Andrew Sale, as well as recent advances by Conan Gillis and Francis Wagner.

- **February 10**
  Speaker: Alexander Borisov (Binghamton)
  Title: A structure sheaf for Kirch topology, an update
  Abstract: Kirch topology on $\mathbb N$ goes back to a 1969 paper of Kirch. It can be defined by a basis of open sets that consists of all infinite arithmetic progressions $a+d\mathbb N_0$, such that $gcd(a,d)=1$ and d is square-free. It is Hausdorff, connected, and locally connected. I will give an update on my current work on a natural presheaf of functions on this topological space: locally integer polynomial functions. In particular, I will discuss when the sheafification is equal to the presheaf, and when it is bigger. I will also discuss (Cech) cohomology. In particular, I will give examples with trivial and nontrivial H^1. No prior knowledge of the topic is assumed. This talk will also serve as an introduction to Mithun's talk next week.

- **February 17**
  Speaker: Mithun Veettil (Binghamton)
  Title: Some results on the Locally LIP functions
  Abstract: Locally LIP functions are obtained as a result of sheafification of the presheaf LIP on some infinite subset X of $N={1,2,3,\ldots}$, with a prescribed topology. Often we work with Kirch topology on N that makes N a connected, locally connected, and Hausdorff space.
  If the set X is a union of non-connected open sets, then we can easily define a locally LIP function on X that is not a LIP function globally. In fact, even if the space X is connected, a locally LIP function on X need not be a LIP function on X. In this talk, we will look at $X=N\ $6N$, which is connected, and construct a locally LIP function that is not LIP on X. Also, we will show that this is not the case if one works with $\mathbb{Z}[1/2]$ instead of $\mathbb{Z}$ for the above set X.

- **February 24**
  Speaker: Hari Asokan (Binghamton)
  Title: Variation of Geometric Invariant Theory
  Abstract: Geometric Invariant Theory is used to construct quotients of group actions on varieties, but the outcome depends on a choice of linearization. Variation of Geometric Invariant Theory (VGIT) studies the different quotients resulting from changing this choice. In this talk I will give an informal introduction to VGIT, focusing on how stability changes as linearization varies.

- **March 3**
  Speaker: Connor Stewart (CUNY)
  Title: Conductor–Discriminant Inequality for Tamely Ramified Cyclic Covers
  Abstract: We consider $\mathbb{Z}/n$-covers $X\to\mathbb{P}^1$ defined over discretely valued fields K with excellent valuation ring $\mathcal{O}_K$ and perfect residue field of characteristic not dividing n. Two standard measures of bad reduction for such a curve X are the Artin conductor of its minimal regular model over $\mathcal{O}_K$ and the valuation of the discriminant of a Weierstrass equation for X. We prove an inequality relating these two measures. Specifically, if X is given by an affine equation $y^n = f(x)$ with $f(x) \in \mathcal{O}_K[x]$, and if $\mathcal{X}$ is its minimal regular model over $\mathcal{O}_K$, then the negative of the Artin conductor of $\mathcal{X}$ is bounded above by $(n-1)v_K(\textrm{disc (rad}\ f))$. This extends previous work of Ogg, Saito, Liu, Srinivisan, and Obus-Srinivasan on elliptic and hyperelliptic curves. (Joint work with Andrew Obus and Padmavathi Srinivasan.)

- **March 10**
  Speaker: Eric Yin (Binghamton)
  Title: TBA
  Abstract: TBA

- **March 17**
  Speaker: Anitha Srinivasan (Comillas University, Madrid), by Zoom
  Title: The generalized Markoff equation
  Abstract: The talk will look at various aspects of the generalized Markoff equation $a^2+b^2+c^2=3abc+m$ ($m\ge 0$), giving an overview of all the exciting work in the area. A few examples of topics that will be mentioned are: the classification of solution triples (a, b, c) that come from k-Fibonacci sequences, open conjectures (which $m's$ have no solutions?), counting algorithms for the number of solutions (trees) and the Markoff equation mod p.

- **March 24**
  Speaker: Jauing Jun (SUNY New Paltz)
  Title: TBA
  Abstract: TBA

- **April 14**
  Speaker: Anubhav Nanavaty (Cornell University)
  Title: TBA
  Abstract: TBA

- **April 21**
  Speaker: Joe Kramer-Miller (Lehigh University)
  Title: TBA
  Abstract: TBA

- **April 28**
  Speaker: TBA
  Title: TBA
  Abstract: TBA