Conference: "Arithmetic Statistics" - August 24-28, 2026

Date	Monday, August 24, 2026, 10:00 a.m.
Speaker	Peter Koymans
Title	The average 6-torsion
Abstract	Cohen and Lenstra made influential conjectures regarding the average value of the n-torsion of class groups of quadratic fields. So far these conjectures have been proven only for a very select number of values of n, namely n = 2^k or n = 3. In this talk, we sketch how to obtain asymptotics for the average 6-torsion. This is joint work with Robert Lemke Oliver, Efthymios Sofos and Frank Thorne.

Date	Monday, August 24, 2026, 11:30 a.m.
Speaker	Béranger Seguin
Title	Asymptotics of extensions of function fields
Abstract	In this talk, we survey several results on the asymptotic distribution of extensions of function fields over finite fields. I will summarize classical results, recent breakthroughs on the tame case, and progress on the general abelian case, explaining the key ideas in each case. I will then spend significant time talking about what we know in the non-abelian wild case, notably explaining my own work with Fabian Gundlach. An explicit goal of the talk is to make experts of the tame (resp. wild) case more aware of what's happening for wild (resp. tame) extensions, and to invite everyone to think about the possibility of a unification and of a general conjecture.

Date	Monday, August 24, 2026, 3:00 p.m.
Speaker	Amanda Tucker
Title	Counting D_8 fields containing Q(i)
Abstract	We count the family of octic extensions of Q containing Q(i) with Galois group D_8 when ordered by discriminant. We solve the relevant embedding problems for the Twisted Malle Conjecture of Alberts, follow the sieving method of Fouvry-Klüners, and compare our results to the recent conjectures of Loughran and Santens. This is joint work with Brandon Alberts, Helen Grundman, Shilpi Mandal, and Alexander Slamen.

Date	Monday, August 24, 2026, 4:30 p.m.
Speaker	Jack Miller
Title	Erdős–Kac theorems for discriminants of number fields
Abstract	The classical Erdős-Kac theorem gives a central limit theorem for the number of prime divisors of a random integer. We prove an analog for the number of ramified primes in a random G-extension of a number field when G is abelian. This builds on previous work of Lemke Oliver and Thorne. Our main technical result is a probabilistic method for finite sums of Euler products that allows us to “condition” on each Euler product, obtaining “conditional independence” for local events in many conjectural situations that are predicted by the work of Bhargava, Alberts, and Loughran–Santens.

Date	Tuesday, August 25, 2026, 9:30 a.m.
Speaker	Daniel Loughran
Title	The distribution of class groups via stacks
Abstract	The speaker has made conjectures with Tim Santens on the leading constant in Malle's conjecture on number fields of bounded discriminant using algebraic stacks. In this talk we apply these predictions to the distribution of class groups, i.e. the Cohen-Lenstra heuristics and variants. It agrees with existing predictions in the literature and explains via stacks the strange phenomena coming from roots of unity, but with a caveat that one needs to avoid some bad cases where we have new counter-examples. This is joint work with Ross Paterson and Tim Santens.

Date	Tuesday, August 25, 2026, 11:00 a.m.
Speaker	Robert Lemke Oliver
Title	Upper bounds on number fields
Abstract	Consider the family of Galois extensions of a number field with fixed Galois group G. I'll discuss recent work of mine on the number of such extensions whose discriminant is bounded by some parameter X, with the aim of connecting it to current and ongoing work on so-called "inertial multiplicity bounds." I'll also indicate what the bottlenecks in current approaches are, some of which might be surprising.

Date	Tuesday, August 25, 2026, 4:30 p.m.
Speaker	Nicolas Potthast
Title	Asymptotics of elementary-abelian extensions of function fields
Abstract	In 2004, Malle published his famous conjecture on the asymptotics of number field extensions with a fixed Galois group, counted by discriminant. The conjecture can be generalised directly to global function fields in the tame case. For the wild case, Lagemann, however, gave a lower bound for non-cyclic abelian extensions that exceeds the naive generalisation of Malle’s conjecture. In fact, the lower bound yields that the a-constant has to be larger in this setting. In this talk, we consider local and global function fields and determine the precise asymptotics of wildly ramified elementary-abelian extensions of these fields, counted by discriminant. To determine the asymptotics, we follow the classical approach of analysing the corresponding Dirichlet series of the counting function. Finally, I will give a brief outlook on the case of all wildly ramified abelian extensions, which is currently work in progress in collaboration with Tejasi Bhatnagar and John Yin.

Date	Wednesday, August 26, 2026, 9:30 a.m.
Speaker	Alexander Smith
Title	Tamagawa ratios and unbounded Selmer moments
Abstract	Given a family of elliptic curves over a number field and a prime p, we give a conjecture for the order of growth of the size of the p-Selmer groups in the family. In the case that the p-torsion submodule is constant across the family, we prove that this conjecture is true. In this talk, we focus on the tools used to prove this theorem, including results from sieve theory and model theory. We also go through some of the counterintuitive applications of the result, including to the family of elliptic curves with two distinct 3-isogenies. This work is joint with Peter Koymans.

Date	Wednesday, August 26, 2026, 11:00 a.m.
Speaker	Tim Santens
Title	The leading constant in Malle's conjecture for function fields
Abstract	I will discuss how one can use the recent breakthrough of Landesman and Levy on homological stability of Hurwitz spaces to prove a certain version of Malle's conjecture over global functions with an explicit leading constant. A new phenomenon compared to the number field case is that there is not one leading constant but a periodic set of leading constants. I will give an interpretation of all of these leading constants using the Brauer group of the stack BG. The crucial ingredient in the proof is an interpretation of the Frobenius fixed stable components of Hurwitz spaces in terms of the Brauer group.

Date	Thursday, August 27, 2026, 9:30 a.m.
Speaker	Jiuya Wang
Title	Discussion on b-constant in Malle's conjecture
Abstract	The b-constant in Malle's original conjecture has been discovered to have counterexample by Klueners in 2004, and Turkelli proposed a correction of Malle's conjecture in 2008 incorporating Klueners' counterexamples based on function field analogue. We will discuss a recent counterexample towards Turkelli's proposal and propose a further modification for Malle's conjecture along with its variations over number fields.

Date	Thursday, August 27, 2026, 11:00 a.m.
Speaker	Carlo Pagano
Title	Random profinite groups are finitely presented with probability 1
Abstract	Yuan Liu and Melanie Wood introduced a model for random profinite groups used to eventually model the statistics of the etale fundamental group of the ring of integers of a random number field in natural families. A natural question, stemming from Shafarevich's conjecture, is whether these groups are typically finitely presented. We present a proof that they are indeed finitely presented with probability 1. This is joint work with Mark Shusterman.

Date	Thursday, August 27, 2026, 3:00 p.m.
Speaker	Robin Visser
Title	Higher genus theory and unramified quadratic extensions of biquadratic fields
Abstract	For a real biquadratic field K, genus theory and the work of Fouvry and Klüners account for many of the quadratic extensions of K which are unramified at all finite places (UAFP). However, in general there can exist further UAFP extensions, obtained by adjoining square roots of elements lying genuinely in the biquadratic field K. We extend the higher genus theory of Koymans and Pagano to multiquadratic fields K generated by square roots of integers that are not necessarily pairwise coprime, and use this to characterise all UAFP quadratic extensions of real biquadratic fields. As an application, we study the distribution of the number of non-genus UAFP extensions, which we describe in terms of coranks of random symmetric matrices over F_2. Time permitting, we shall also present some conjectures and heuristics which suggest that real biquadratic fields almost never admit units of all signatures, even when all three quadratic subfields do. This talk is based on joint work in progress with Siu Hang Man and Pavlo Yatsyna.

Date	Thursday, August 27, 2026, 4:30 p.m.
Speaker	Matt King
Title	Upper bounds uniform in the base field for quartic S4 extensions of a number field
Abstract	In the 1980s, Datskovsky and Wright proved Malle's conjecture for cubic S3 extensions of a general number field, and in 2015 Bhargava, Arul Shankar, and Xiaoheng Wang did the same for quartic S4 extensions. Letting N_n(X, F) denote the number of degree-n S_n extensions L of F with |Nm(Disc(L/F))| <= X, these results prove that N_n(X, F) = C_F X + o_F(X) where the constant C_F > 0 is given explicitly, but the error term o_F(X) depends in an unspecified way on the base field F. For applications, it can be necessary to obtain uniform upper bounds for N_n(X, F), that is, bounds of the form C_d X |Disc(F)|^A for A as small as possible. Here d = [F: Q] and C_d > 0 depends only on d. In their work "The average size of three torsion in class groups of 2-extensions," Lemke Oliver, Jiuya Wang, and Wood prove uniform upper bounds for N_3(X, F), using different techniques depending on the relative sizes of X and |Disc(F)|. I will present my work on proving uniform upper bounds for N_4(F, X) using geometry of numbers. Time-permitting, I will discuss uniform upper bounds which make use of Shintani Zeta functions and class field theory.

Date	Friday, August 28, 2026, 9:30 a.m.
Speaker	Fabian Gundlach
Title	Counting number fields by their smallest defining polynomial
Abstract	When do two irreducible polynomials with integer coefficients define the same number field? Improving on work of Bhargava, Shankar, and Wang, we show that in a certain statistical sense, this usually only happens if the polynomials lie in the same orbit of a particular action of GL_2 x GL_1. We use this to count number fields whose smallest defining polynomial has coefficients of size at most X. This three-colored talk is about joint work with Santiago Arango-Piñeros, Robert J. Lemke Oliver, Kevin J. McGown, Will Sawin, Allechar Serrano López, Arul Shankar, and Ila Varma.

Date	Friday, August 28, 2026, 11:00 a.m.
Speaker	Brandon Alberts
Title	Number Field Counting via Multiple Dirichlet Series
Abstract	We show how to use multiple Dirichlet series techniques to prove new asymptotics for the number of G-extensions with bounded discriminant, inspired by their use in the study of moments of L-functions. In particular, assuming the generalized Lindelof Hypothesis we prove the existence of an asymptotic whenever G has nilpotency class 2. This work is joint with Alina Bucur.