天元數學國際交流中心
Tianyuan Mathematics Research Center

中法数论研讨会

Sino-French Number Theory Workshop

会议手册

云南·昆明　宜良柴石滩水库库区内

2026 年 6 月 28 日-2026 年 7 月 4 日

Contents

TMRC is a mathematics and interdisciplinary science exchange institution jointly supported by the Chinese Academy of Sciences, the National Natural Science Foundation of China, the Chinese Mathematics Society, the Academy of Mathematics and Systems Science of the Chinese Academy of Sciences, and relevant departments of Kunming City. It is located in a beautiful mountain near Kunming (1h30min from the Airport to the Institute by car).
Please find more information about TMRC at http://tianyuan.amss.ac.cn.

Registration Date & Location:
June 28th, 2026 (Sunday)
Address: Tianyuan Mathematics Research Center, Chaishitan Reservoir area,
Yiliang County, Kunming City, Yunnan Province
地址：云南省昆明市宜良县柴石滩风景区天元数学国际交流中心

Conference Time: June 29-July 3, 2026

Tips:
Tianyuan Mathematics Research Center is located halfway up the mountain in the Chaishitan Reservoir area. The temperature is 2-3 degrees lower than the county town, it is cooler in the morning and evening especially; Tianyuan Mathematics Research Center is located in a national first-class public welfare forest, and there are many mosquitoes. In addition, the center is about an hour's drive from the county hospital. It is recommended to prepare some common medicines;

There is nearly 40 minutes of rural roads on the way to the center, and the road is narrow and winding. There is a three-kilometer mountain road from the reservoir gate to the center, and rockfalls occur from time to time, especially on rainy days. For safety reasons, it is recommended that the trip time should not be too late.

Breakfast: 7:30-9:00

Lunch: 11:30-13:00

Dinner: 17:30-19:00

Invited Speakers

Samuele Anni	Aix-Marseille University
Denis Benois	University of Bordeaux
Paul Denis Rene Boisseau	Max Planck Institute
Pierre-Henri Chaudouard	University Paris-cité
Mladen Dimitrov	Lille University
Yiwen Ding	Peking University
Heng Du	Tsinghua University
Van Hoften	Zhejiang University
Samuel Le Fourn	Grenoble Alpes University
Dongwen Liu	Zhejiang University
Joao Lourenco	Univ. Sorbonne Paris Nord
Alexandre Maksoud	Max Planck Institute
Stefano Morra	University Paris 8
Benjamin Schraen	Lyon University
Benchao Su	Peking University
Arnaud Vanhaecke	MCM, CAS
Xiangqian Yang	Peking University
Hongjie Yu	MCM, CAS

Organizers

Loic Merel	Université Paris Cité, France
Yichao Tian	MCM, CAS

Conference Schedule

June 29, 2026		
9:15-10:15	Pierre-Henri Chaudourd	Counting Hitchin bundles for the group SL(n)
10:15-10:45	Tea Break	
10:45-11:45	Hongjie Yu	Counting l-adic and p-adic coefficient objects over finite fields
11:45-14:00	Lunch	
14:00-15:00	Benjamin Schrean	Locally analytic p-adic Langlands correspondence : local-global compatibility and principal series.
15:00-15:30	Tea Break	
15:30-16:30	Yiwen Ding	Translation functors and locally analytic p-adic Langlands for GL2(Qp)
June 30, 2026		
9:15-10:15	Stefano Morra	Looking for a mod p local Langlands correspondence
10:15-10:45	Tea Break	
10:45-11:45	Arnaud Vanhaecke	Realizing the locally analytic special series in the pro-étale cohomology of Drinfeld space
11:45-14:00	Lunch	
14:00-15:00	Denis Benois	Log-crystalline representations and (ϕ, Γ)-modules
15:00-15:30	Tea Break	
15:30-16:30	Heng Du	p-adic Hodge theory for de Rham local systems around rank-one points
July 1, 2026		
8:45-9:45	Samuele Anni	Modular Entanglement

9:45-10:00	Tea Break	
10:00-11:00	Samuel Le Fourn	Integrality of rational points of the quotients of modular curves $X_0(N)^*$ for N non squarefree
11:00-11:15	Tea Break	
11:15-12:15	Van Hoften	Igusa stacks and the Jacquet--Langlands correspondence
July 2, 2026		
9:15-10:15	Paul Denis Rene Boisseau	Non-tempered Gan-Gross-Prasad conjectures for general linear groups
10:15-10:45	Tea Break	
10:45-11:45	Dongwen Liu	Standard automorphic L-functions of symplectic type
11:45-14:00	Lunch	
14:00-15:00	Xiangqian Yang	Local Whittaker coefficients of cohomology of Shimura varieties
15:00-15:30	Tea Break	
15:30-16:30	João Lourenço	Comparison of sheaf categories on Isoc_G and Bun_G
July 3, 2026		
8:45-9:45	Alexandre Maksoud	On the local geometry of the eigencurve near classical weight one points, and R=T theorems
9:45-10:00	Tea Break	
10:00-11:00	Benchao Su	On the Ext algebra of some supercuspidal locally analytic representations of GL2(Qp)
11:00-11:15	Tea Break	
11:15-12:15	Malden Dimitrov	Geometry of the Hilbert cuspidal eigenvariety at Eisenstein points and Iwasawa theory

Conference Schedule

	Monday **June 29th**	**Tuesday** **June 30th**	**Wednesday** **July 1st**	**Thursday** **July 2nd**	**Friday** **July 3rd**
9:15-10:15	Pierre-Henri Chaudourd	Stefano Morra	Samuele Anni (8:45--9:45)	Paul Denis Rene Boisseau	Maksoud (8:45--9:45)
10:45-11:45	Hongjie Yu	Arnaud Vanhaecke	Samuel le Fourn (10:00-11:00)	Dongwen Liu	Benchao Su 10:00-11:00
Lunch			Van Hoften (11:15-12:15)		Mladen Dimitrov (11:15-12:15)
14:00-15:00	Benjamin Schrean	Denis Benois		Xiangqian Yang	
15:30-16:30	Yiwen Ding	Heng Du		João Lourenço	

Titles and Abstracts

Samuele Anni (Aix-Marseille University)

Modular Entanglement

Abstract: We study entanglement phenomena between residual Galois representations attached to modular forms and modular abelian varieties, focusing on whether two such representations - possibly in different residual characteristics - can correspond to the same number field or share a common non-trivial subfield. These questions are closely related to inverse Galois theory and to congruences between modular forms.
We present explicit examples arising from elliptic curves: for levels (N_1,N_2 \in {3,4,5}), we describe one-dimensional families of pairs of elliptic curves whose (N_1)- and (N_2)-torsion Galois representations exhibit projective (A_4)-entanglement. We also give explicit models for the associated modular surfaces over suitable cyclotomic extensions of (\mathbf{Q}).
This is joint work with David Kohel (AMU) and Zoé Yvon (Toulouse), and ongoing work with Luis Dieulefait (UB) and Gabor Wiese (Université du Luxembourg).

Denis Benois (University of Bordeaux).

Log-crystalline representations and (ϕ, Γ)-modules.

Abstract: In this talk, we define and study the notion of a p-adic log-crystalline representation of the logarithmic fundamental group of certain affinoid algebras, similar to p-adic semistable representations of the absolute Galois group of a local field due to Fontaine. Our main goal is todescribe corresponding (ϕ, Γ)-modules, generalizing the theory of Wach modules to the relative setting. This is a joint work with Abhinandan.

Paul Denis Rene Boisseau (Max Planck Institute)

Non-tempered Gan-Gross-Prasad conjectures for general linear groups

Abstract: The conjectures of Gan, Gross and Prasad relate periods of automorphic forms to central values of L-functions. While the conjectures were originally formulated for tempered cuspidal representations, they were recently generalized by the same authors to extend to non-tempered forms. In the case of general linear groups, this framework generalizes the classical theory of Jacquet, Piatetskii-Shapiro and Shalika on the Rankin-Selberg period.
In this talk, I will explain how to regularize the associated divergent integral and show that it indeed computes the predicted special values of L-functions. The key to our approach is analyzing the residues of Rankin-Selberg zeta integrals which produce periods for these non-tempered forms. Finally, I will describe how these periods contribute to the non-generic spectrum of the Jacquet-

Rallis trace formula.

Pierre-Henri Chaudouard (University Paris-cité)

Counting Hitchin bundles for the group SL(n)

Abstract: Let C be a smooth projective curve of genus g over a finite field and D a divisor on C of degree >2g−2. A Hitchin bundle is a pair (E,f) where E is a vector bundle on C and f:E-->E(D) is a twisted endomorphism. We will explain how to get a “universal” formula for the number of stable Hitchin bundles (E,f) such that rank(E)=n, trace(f)=0, det(E) is fixed of degree prime to the rank. When we simply fix the degree of det(E) (prime to n), such a result is due to Mozgovoy-O'Gorman following the works of Mozgovoy-Schiffmann and Mellit. We will explain how one can reduce to it by a study of the relative cohomology of the Hitchin fibration.

Mladen Dimitrov (Lille University)

Geometry of the Hilbert cuspidal eigenvariety at Eisenstein points and Iwasawa theory

Abstract: Tapping into the complexity of the local geometry of the Hilbert cuspidal eigenvariety at Eisenstein points, we will present a modular construction à la Ribet of an everywhere unramified Zp-extension in a setting which seems beyond the scope of the Iwasawa main conjecture.

Yiwen Ding (Peking University)

Translation functors and locally analytic p-adic Langlands for GL2(Qp)

Abstract: We discuss translation operations for rank-two (phi, Gamma)-modules and locally analytic representations, and show that they are compatible under Colmez’s locally analytic p-adic Langlands correspondence for GL2(Qp). We then explain several local and global applications.

Heng Du (Tsinghua University)

p-adic Hodge theory for de Rham local systems around rank-one points

Abstract: One of the central themes of p-adic Hodge theory is understanding p-adic Galois representations via linear algebraic data. The Colmez–Fontaine theorem, together with Berger’s p-adic monodromy theorem, realizes this idea for de Rham representations. A natural and important question is how such a statement should vary in families.
In this talk, I will discuss a relative p-adic monodromy conjecture for de Rham local systems on rigid analytic varieties. The main new input is the Newton polygon function attached to a de Rham

local system. Around rank-one adic points, we prove that the expected local form of the relative p-adic monodromy conjecture is equivalent to the local constancy of this Newton polygon function. As an application, we prove that a version of the relative p-adic monodromy conjecture always holds on a dense open subset.

Van Hoften (Zhejiang University)

Igusa stacks and the Jacquet--Langlands correspondence.

Abstract: Igusa stacks are p-adic analytic objects associated to Shimura varieties of abelian type which link the Shimura variety to Fargues--Scholze's Bun_G, the moduli stack of G-bundles on the Fargues--Fontaine curve. I will state a conjecture about exotic isomorphisms between Igusa stacks for different Shimura varieties, which is closely related to the exotic Hecke correspondences of Helm, Tian--Xiao and Xiao--Zhu. I will give a proof of this conjecture under some assumptions, and explain cohomological consequences. This is joint work in preparation with Jack Sempliner.

Samuel Le Fourn (Grenoble Alpes University)

Integrality of rational points of the quotients of modular curves $X_0(N)^*$ for N non squarefree

Abstract: Modular curves $X_0(N)$ parametrise elliptic curves E endowed with a cyclic torsion subgroup of order N. A famous result of Mazur (crucial in the study of Galois representations associated to elliptic curves) implies that $X_0(N)$ has only "trivial" rational points for N>163 prime, and it leads to solving the problem for a general N. For N squarefree, the method used by Mazur (based on formal immersions) doesn't work as there should be (under BSD conjecture) no so-called "rank zero quotient" of J_0(N)*, which are fundamental for Mazur's method.
Surprisingly though, when N is not squarefree, there is just enough leeway to allow for rank zero quotients. In this talk based on a joint work with Sachi Hashimoto and Timo Keller, I will explain how to exploit this fact to prove integrality (i.e. potentially good reduction of elliptic curves associated to non-cuspidal rational points) for almost all non-squarefree levels N, and how our search lead to unexpected explicit rational points for some sporadic levels N. If time permits, I will also describeour current research on what we can tell on the integral points on those modular curves.

Dongwen Liu (Zhejiang University)

Standard automorphic L-functions of symplectic type

Abstract: For regular algebraic cuspidal automorphic representations of GL(2n) of symplectic type, I will explain period relations for the critical values of their standard L-functions and the main ingredients of the proof, based on joint work with Jiang, Sun, and Tian. If time permits, I will also briefly explain the p-adic interpolation, based on joint work with Sun.

Joao Lourenco (Univ. Sorbonne Paris Nord)

Comparison of sheaf categories on Isoc_G and Bun_G

Abstract: For a connected reductive group G over $\mathbb{Q}_p$, the geometrization of the local Langlands correspondence has given rise to two different categories of étale sheaves on the geometric/automorphic side: those arising from the moduli stack Bun_G of G-torsors on the Fargues--Fontaine curve, introduced by Fargues--Scholze, and those arising from the moduli stack Isoc_G of G-isocrystals, introduced by Zhu. These two approaches offer complementary advantages: the former is better suited for studying Hecke operators and Eisenstein series, while the latter is more natural for taking categorical traces. We will explain the construction of an equivalence $\mathrm{Shv}(\mathrm{Isoc}_G) \simeq D(\mathrm{Bun}_G)$ with coefficients in $\bar{\mathbb{F}}_\ell$. This is joint work with Gleason, Hamann, Ivanov and Zou.

Alexandre Maksoud (Max Planck Institute)

On the local geometry of the eigencurve near classical weight one points, and R=T theorems

Abstract: The study of p-adic deformations of automorphic forms was initiated by Hida in the 1980s, following his discovery of systematic congruences between the Fourier coefficients of modular forms. The eigencurve, introduced by Coleman and Mazur, offers a geometric framework for understanding these congruences, and has since become a central tool in tackling deep number-theoretic conjectures, such as the Birch and Swinnerton-Dyer conjecture.
At non-critical classical points of integer weight k>1, the eigencurve is known to be smooth, thanks to the classicality theorems of Hida and Coleman. In contrast, the structure of the eigencurve at weight k=1 is significantly more subtle and intricate.
In this talk, after reviewing the seminal work of Bellaïche and Dimitrov in the so-called p-regular case (i.e. when crystalline Frobenius does not act by a scalar), I will present joint work with Adel Betina and Alice Pozzi giving a complete description of the local geometry in the more delicate p-irregular case. Our calculations uncover profound connections to p-adic transcendental number theory.
Time permitting, I will also discuss ongoing work with Adel Betina comparing the completed local rings of the eigencurve at p-irregular weight one points with suitable Galois deformation rings.

Stefano Morra (University Paris 8)

Looking for a mod p local Langlands correspondence

Abstract: The mod p local Langlands program aims at a parametrization of smooth mod p representations of a p-adic GL_n in terms of mod p continuous n-dimensional Galois representations of the p-adic field. This was realized in the case of GL_2(Q_p) (and continuous 2-dimensional

representations of Gal_{Q_p}) by work of Colmez, following work of Breuil, and its compatibility with the mod p cohomology of (a tower above p of) modular curves was established by Emerton, all in the early 2000.
The situation for GL_2 over an extension of Q_p, even an unramified extension, remains unclear, eventhough many partial results show that such a local correspondence should exist. In particular, one of the main questions is whether the mod p Hecke eigenspaces of a tower of Shimura curves at p are "purely local", i.e. only depend on the underlying local Galois representations and not on the global context. Indeed, such a locality would give strong evidence for the existence of a mod p local Langlands correspondence outside of GL_2(Q_p) compatible with global constructions.

Benjamin Schraen (Lyon University)

Locally analytic p-adic Langlands correspondence : local-global compatibility and principal series.

Abstract: In this talk, I'll discuss some problem concerning the behaviour of principal series representations of the group GLn in the p-adic Langlands Program. This behaviour is linked to the construction of companion points on eigenvarieties (spaces of finite slope p-adic automorphic forms) and also to the coherent sheaves which can be constructed on these eigenvarities. The local behaviour of these coherent sheaves can be understood in terms of a functor from the BGG category to the category of equivariant coherent sheaves on the Steinberg variety. I'll present all the objects involved in this construction and discuss a recent result obtained in collaboration with Eugen Hellmann and Valentin Hernandez.

Benchao Su (Peking University)

On the Ext algebra of some supercuspidal locally analytic representations of GL2(Qp)

Abstract: Let rho be a two-dimensional de Rham p-adic Galois representation of GQp, with Hodge-Tate weights 0, 1, whose associated Weil-Deligne representation is absolutely irreducible. By the p-adic local Langlands correspondence for GL2(Qp), we can attach to rho a unitary Banach representation Pi of GL2(Qp) and a locally analytic representation pi of GL2(Qp). When rho is of global origin, we will explain how to determine the Ext algebra of pi, and compare it with the Ext algebra of Pi. This is joint work in progress with Zhenghui Li and Zhixiang Wu.

Arnaud Vanhaecke (MCM, CAS)

Realizing the locally analytic special series in the pro-étale cohomology of Drinfeld space

Abstract: On the Galois side, Fontaine’s theory characterizes indecomposable semistable non-crystabelian p-adic representations in terms of a filtration, parametrized by the so-called Fontaine–Mazur higher L-invariant. In recent work, Z. Qian computed extension groups between locally

analytic Steinberg representations for GL_d(Q_p) and introduced the corresponding Breuil–Schraen higher L-invariant. These invariants naturally give rise to complexes of locally analytic representations involving Steinberg representations.
In ongoing joint work with Zicheng Qian and Benchao Su, motivated by the case of GL_2(Q_p), we show that the pro-étale complex of Drinfeld's symmetric space, with coefficients in a p-adic local system, matches both the Fontaine–Mazur and the Breuil–Schraen higher L-invariants. This provides a geometric realization of the locally analytic special series for GL_d(Q_p). In the talk, I will state the main expected theorems and outline the proof, which proceeds through several reduction steps.

Xiangqian Yang (Peking University)

Local Whittaker coefficients of cohomology of Shimura varieties

Abstract: We discuss torsion-vanishing results for the local Whittaker coefficients of the depth-0 part of the cohomology of Shimura varieties of abelian type. A key ingredient is the t-exactness of the tame coarse categorical local Langlands functor. This is a joint work in progress with Ian Gleason and Xinwen Zhu.

Hongjie Yu (MCM, CAS)

Counting l-adic and p-adic coefficient objects over finite fields

Abstract: Deligne proposed a program for the counting and understanding arithmetic coefficient objects, such as l-adic local systems and their companions, on curves over finite fields. This program suggests Lefschetz-type phenomena relating moduli spaces of coefficient objects to arithmetic fixed points.
In this talk, I will discuss results and questions around this circle of ideas. I will first recall the l-adic side of the story, including counting results for l-adic local systems and certain numerical coincidences with point-counts of Higgs moduli. I will then explain a p-adic perspective, in which overconvergent F-isocrystals may be viewed as fixed points of a Frobenius-type operation on moduli spaces of connections. I will conclude by outlining ongoing work on a Lefschetz-type fixed point formula in this setting.
Parts of the talk are based on previous works, and parts on joint work in preparation with T. Abe, and with T. Abe, K. Shimizu, and G. Oh.